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# **The National Accounts as a Tool for Analysis and Policy; History, Economic Theory and Data Compilation Issues**

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**THE NATIONAL ACCOUNTS**  
**AS A TOOL FOR ANALYSIS AND POLICY;**  
*IN VIEW OF HISTORY, ECONOMIC THEORY AND*  
*DATA COMPILATION ISSUES*  
**FRITS BOS**

2009



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## PREFACE SECOND EDITION

### *Reactions to the first edition*

The first edition of this book was my PhD thesis, published on own-account five years ago. It generated many positive and enthusiastic reactions. Two quotes from emails may illustrate this:

- “From now on we have a new reference work on this important topic” (Georgy Szilagyi, Hungarian Statistical Office)
- “It should be required reading for all empirical macro-economists” (Elmer Sterken, Groningen University).

I am very pleased that the book will now be published by VDP publishers and may receive in this way a more general and wider audience.

### *Differences with the first edition*

This second edition appears with a delay of five years. I have used the opportunity to rewrite and expand some parts and update the text.

At present, a new generation of universal and European guidelines is being written (SNA08 and ESA09). The new basic concepts have already been agreed upon, but the texts of the guidelines are still being drafted. I am actively involved by drafting a major part of the new European guidelines<sup>1</sup>. These new guidelines are now also taken into account in the book’s historic overview and the last section of the discussion of the basic concepts (section 6.10).

In the first edition, regional accounts was only mentioned briefly and without stressing their relevance for policy and analysis. This is line with the current and new universal guidelines (SNA93 and SNA08): they devote only some paragraphs to regional accounts. Now my insights have changed. Regional accounts are very important. They do not only serve to provide basic macro-economic statistics for major political regions within a nation or granting European funds to poor regions. For understanding economic growth, regional accounts are essential, as economic growth is often location specific and can differ substantially within a nation. Awarding this year’s Nobelprize in economics to Paul Krugman reflects the importance of this issue.

Five years ago a major difference between business accounting and national accounting seemed to be the need for standardization. However, major bookkeeping scandals at big multinationals (e.g. Enron and Albert Heijn), capital markets becoming more international and the current financial crisis have changed this. Also for business accounts, much more strict and internationally comparable accounting standards are now regarded as very important. This new insight is now also incorporated in the book.

The book’s historic overview is expanded with information from my most recent papers on the history of national accounting (Bos, 2006a and Bos, 2008). This implies also the various comments received on these papers have contributed to this second edition. Jeroen van den Bergh, a prominent environmental economist who even advocates abolishing GDP, stressed that substantially more attention should be paid to the links with welfare and the environment. Macroeconomist Rick van der Ploeg<sup>2</sup> remarked that “When James Meade received the Nobel Prize for his work on international economics, he told me that he would have preferred to receive it for his work with Richard Stone on national accounting”. This

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<sup>1</sup> As a private consultant, I am (re)writing and editing the chapters Transactions in products and non-produced assets, Supply and use tables and Input-output framework, Satellite accounts, Quarterly accounts and Regional accounts.

<sup>2</sup> I am also grateful for his compliment on my paper on the history of Dutch national accounting: “Thank you for this very interesting historic overview ... My former supervisor, Sir Richard Stone, would have been proud”.

stimulated to pay more attention to the importance of James Meade for national accounting. The Dutch economic historians Jan Luiten van Zanden and Wantje Fritschy helped to understand why Dutch political arithmetic started so late in comparison to France and England.

According to the protocol of Dutch Ph.D.theses, members of the thesis-committee are not to be acknowledged in the thesis. In this second edition, this protocol is not relevant anymore. As a consequence, I can now express my gratitude in particular for the comments by André Vanoli (“You are exaggerating the drawbacks of the standard sequence of accounts”, “The chapters on compiling and using national accounts should be required reading for national accountants, other statisticians and economic researchers”), Mary Morgan (“The concept of tacit knowledge may be useful for your thesis”, “How reliable is the national accounts as a compass?”) and Frank den Butter (“What is a better national accounting system? What are your criteria for progress?”).

### *Interaction between compiling and using national accounts*

A major purpose of this book is to stimulate the interaction between compiling and using national accounts. In comparison to the first edition, I have five extra years of experience at the Netherlands Central Bureau for Economic Policy Analysis (CPB). The CPB was founded in 1946 and Jan Tinbergen was its first director. Quantitative policy analysis is a major part of the work at the CPB and this fits very well into the history of national accounting.

All early estimates of national income were ‘political arithmetic’, i.e. practical and directed at concrete policy issues, like national performance, poverty, unfair taxation and sustainability of public finance. These early estimates were not only the start of measuring national economies, but were also the start of quantitative policy analysis. At that time, there was no strict division of tasks between compiling national accounts and using the national accounts for policy analysis and forecasting.

My knowledge and experience in national accounting is very useful for my work at the CPB, e.g. forecasting and analysing Dutch public finance, productivity analysis and analyzing changes in the Dutch tax system. My experience at the CPB is also very useful for drafting new European guidelines on national accounting and revising this book. For example, to realize the importance of regional accounts for analyzing economic growth and of input-output tables for decomposing economic growth rates and to be aware of the problematic relationship between operating surplus and taxable business income and the limitations of the classification for government expenditure (COFOG) for monitoring and analysis.

Compiling and using the national accounts are complementary and joint products. A strict division of tasks between compiling and using the national accounts is therefore not wise. I hope this book will contribute to stimulating the interaction between compiling and using the national accounts.

A professor in economics (Jules Teeuwes) once wrote that the archaeologist Indiana Jones has one of the most exciting scientific jobs in the world. He contrasted this with national accounting: one of the duller and least interesting topics in economics. I hope this book convincingly argues why I do not agree with this: national accounting is interesting, very important for economic policy and science and certainly not dull and trivial.

Frits Bos, January 2009.

## **PREFACE FIRST EDITION (Ph.D.Thesis)**

### *Economic hamburgers*

This book is about one of the major inventions by economists: the national accounts. Three Nobel-prizes have been awarded to economists mainly working on the national accounts (Kuznets, Leontief and Stone). Many other Nobel-laureates have significantly contributed to the development of the national accounts (e.g. Hicks, Meade and Frisch) or were major users of national accounts (e.g. Tinbergen, Klein, Friedman, Prescott and Kydland). National accounts statistics have made the size, composition and development of national economies and their major components visible. As a consequence, they can be monitored, analysed and used for decision-making.

This book is about international conventions on defining the national economy and its major components. These conventions reflect only to a limited extent straightforward economic principles. They are best regarded as a compromise between many conflicting demands.

This book is also about an atypical statistic, i.e. an overview-statistic compiled on the basis of a wide range of incomplete and inconsistent data.

The book sheds also light on the many practical problems in producing and consuming national accounts statistics and some of their consequences.

National accounts statistics could be regarded as an economic hamburger produced and consumed all over the world. Like hamburgers, there is a problem of reputation and image. National accounts are looked at disdainfully by many economic theorists (“dull bookkeeping”, “messy concepts”, “a description but not an analysis”, “irrelevant for real policy issues”), applied economists (“we use the national accounts statistics but it is not necessary to know the underlying concepts and measurement methods”) and statisticians addicted to sampling theory (“unscientific compilation methods”). This book is an effort to change this image.

### *The road I travelled*

This book is the result of a journey of over 15 years. This journey started at Statistics Netherlands in 1985. My job was to take a fresh look at the international guidelines in view of economic theory. It served to contribute to the drafting of the new universal guideline on the national accounts. It also resulted in my paper “Standard national accounting concepts, economic theory and data compilation issues; on constancy and change in the UN-Manuals on national accounting (1947, 1953, 1968 and 1993)”. This paper can be regarded as the backbone and major precursor of this book. And it was very helpful in writing three chapters in the new European guidelines on national accounting.

My work on compiling national accounts statistics started in 1993 by updating, editing and rewriting the inventory of the sources and methods of Dutch national income statistics (GNP). Participating in the work of the GNP-committee (first as a representative of Statistics Netherlands, then representing the European Commission) gave unique insights in the compilation practice of EU-Member States and experience in monitoring, harmonizing and improving the GNP-statistics of EU-Member States.

Returning to Statistics Netherlands, I became responsible for compiling national accounts statistics on the government and social security. The major challenge was the revision of the Dutch national accounts. This amounted to implementing substantial changes in concepts, reconsideration of the old estimates in view of new and alternative data, a redesign of the compilation process, the development of a new set of national accounts tables and the compilation of revised time series.



Dutch national accounts statistics on government revenue, expenditure, deficit and debt are of great interest to many different data users. My job therefore implied intensive communication with the various national and international data users. It also revealed many examples of misunderstanding and misuse of national accounts statistics.

By accepting a job at the Netherlands Bureau for Economic Policy Analysis (CPB), I have become a user of national accounts statistics. Since 2000 my estimates on government finance do not pertain to the past but to the future. The estimates are based on budgetary plans while taking explicitly into account all kinds of economic and institutional mechanisms. National accounting concepts play a central role in the overview-tables and estimation models on government finance and in the macro-econometric models. However, devising the optimal way to modify the national accounting concepts for such purposes is not simple. The universal national accounting concepts are not sufficiently focused on showing the interactions between the various parts of the economy, on policy issues and on performing simple analyses. Furthermore, most of the detail presented by official national accounts statistics is irrelevant, while some detail presented in unofficial worksheets turns out to be highly relevant. This year the overview tables and estimation models on government finance will be redesigned. This will improve substantially their relevance, while also clarifying and simplifying their links with the national accounts and the macro-econometric models.

### *Acknowledgements*

A major contribution to this journey was made by my first boss at Statistics Netherlands, Cornelis van Bochove. He gave me a quick start in national accounting, created a stimulating research environment, gave me a clear theme (national accounting and economic theory) and learnt me some important lessons (e.g. “Don’t be afraid of big names, think for yourself” and “Don’t try to answer all questions in your paper; evade or avoid important questions where necessary”).

During my journey I learnt a lot from many other national accountants, statisticians and economists. They told me their stories and often gave their opinions on national accounting and my papers and ideas. A major fellow-traveller and personal coach over the years has been Cor Gorter. He is a shy but excellent expert in national accounting and shares the same ideals in national accounting (simplicity and flexibility). As a former roommate, I still remember enjoying his unique collection of lemonades.

In 1997 I received a letter from the eminent Canadian economist Erwin Diewert. He was very enthusiastic about my paper “Standard National Accounting Concepts, Economic Theory and Data Compilation Issues; On Constancy and Change in the UN-Manuals on National Accounting (1947, 1953, 1968 and 1993)”: “a tremendously important and useful paper”. I still cherish this letter and it has stimulated me a lot in completing this book.

Statistics Netherlands, Eurostat and the CPB have been very nice and inspiring places to work. National accounts is no core-business of the CPB. They have nevertheless given me some opportunity and time to complete this book.

Commenting on the drafts of this quite voluminous and kaleidoscopic book is not easy and time-consuming. I would therefore thank Sake de Boer, Cor Gorter, Peter Eering, Alex Lammertsma, Henk Nijmeijer and Dick van Tongeren very much for their comments.

A very special and important role has been played by Professor Bert Steenge. He was the supervisor of my masters’ thesis about the economic consequences of wage indexation. He also proposed to write a PhD thesis about that topic. I preferred to do research on the national accounts at Statistics Netherlands. However, our roads crossed again: in looking for a supervisor of this thesis Bert Steenge (input-output specialist, chairman of the Dutch Committee of Users of National Accounts Statistics) was a logical choice. As such he proved to be a coach with a lot of patience. My lack of progress, changes of jobs and rapidly evolving

family life did not upset him. He was always confident that I would complete the thesis. He really seemed to believe that the delays were productive, as new experiences and insights could now also be incorporated. He also kept asking about my major messages and about the value added of my work vis-à-vis that of others.

Already many years ago most of my friends and family (all?) had lost the faith in completing this PhD thesis. It was a never-ending story that became a taboo. For them no progress was ever visible. For Ghenet, my wife, the situation was quite different. When she met me, I had one clear handicap: a PhD thesis still to be completed. She was frequently the witness and victim of my wish to continue and complete. My time spent on the thesis was time not spent with her. The thesis' invisible weight on my shoulders rested also on her shoulders. These joint opportunity costs have drastically increased with the arrival of our children Oriana, Ricardo, Shannon and Dylan. Even one summer holiday was dedicated to work on this thesis. We are very glad that the journey has now ended.

Frits Bos, February 2003



## 1. INTRODUCTION

### 1.1 Appraisal and misunderstanding of the national accounts

#### *Worldwide use of national accounts statistics*

Since the Second World War, the national accounts have become the universal overview statistic on the national economy. Its key-indicators, like Gross Domestic Product (GDP)-volume growth, National income per capita and government deficit as a percentage of GDP, play a central role in managing and analysing national economies all over the world. Many decisions, income and expenditure are directly influenced by national accounts statistics. For example, private and public contracts contain (official forecasts of) national accounts indices on price- or volume-changes and contributions to the UN and EU are levied as fixed percentages of national income.

For various types of applied economic analysis, national accounts statistics are the reference frameworks for analysis. Examples are input-output analysis, analysis of balance of payments, analysis of government finance, monetary analysis, analysis of economic growth, analysis of the consequences of alternative government policies and forecasting tax revenue and the development of the national economy.

A new set of international guidelines (SNA08, ESA09) is now being drafted. In Europe, the ongoing unification is a great stimulus to national accounts statistics. They are used for monitoring, managing and discussing many European policy issues (e.g. monetary policy, public finance, productivity and growth policy, social policy, regional policy and agricultural policy). An extended, timely and comparable set of national accounts statistics is now available for all EU-Member States. Potential Member States should also meet these data requirements. International productivity research has been given a boost by the universal KLEMS-project, which aims to develop and combine an international data set for productivity analysis with a detailed industry breakdown and productivity analysis.

#### *Widespread lack of understanding*

The worldwide use of national accounts statistics for many important purposes raises fundamental questions about the national accounts as a measuring tool. Are the national accounts statistics sufficiently suited for these jobs? How fair and relevant are the underlying concepts? What are the major differences with concepts used in economic theory or for administrative purposes? How comparable and reliable are the national accounts statistics of the various countries?

Despite the worldwide use of the national accounts, the answers to these questions are not commonly known. The problem is that national accounts are a language not very well spoken and understood anymore. This applies to policy-makers, economic researchers and national accountants alike.

National accounts statistics play an important role in policy, in particular in providing key-indicators on the structure and development of the national economy. A proper use of these statistics requires a good basic understanding of the underlying concepts and the reliability of the data. Without such understanding policy will steer on a wrong or unreliable compass.

Such a good basic understanding of the national accounts is also essential in grasping the benefits of more sophisticated and more reliable national accounts statistics. Without such understanding no such national accounts statistics will be paid for by policy-makers.

Among economic researchers there is a worldwide illiteracy in national accounting. For more than a decade, national accounting was even dropped as a separate topic of research on

the list of the Journal of Economic Literature; only very recently, it has been reintroduced<sup>3</sup>. The economic researchers skilled in national accounting have become more and more extinct. Furthermore, the introduction of new guidelines on national accounting has made a substantial part of their knowledge obsolete. However, for the analysis of economic statistics solid knowledge of the merits and limitations of their concepts and measurement is indispensable. According to Schumpeter (1945, p. 14):

”We need statistics not only for explaining things, but also in order to know precisely what there is to explain. ... It is impossible to understand statistical figures without understanding how they have been compiled. It is equally impossible to extract information from them or to understand the information that specialists extract for the rest of us without understanding the methods by which this is done- and the epistemological backgrounds of these methods. Thus, an adequate command of modern statistical methods is a necessary (but not a sufficient) condition for preventing the modern economist from producing nonsense”.

Also for good macro-economic policy and analysis, knowledge of national accounting is important but often lacking. According to Mankiw (2006, p. 30):

“While the early macroeconomists were engineers, the macroeconomists of the past several decades have been more interested in developing analytic tools and establishing theoretical principles. These tools and principles, however, have been slow to find their way into applications. As the field of macroeconomics has evolved, one recurrent theme is the interaction –sometimes productive and sometimes not– between the scientists and the engineers. The substantial disconnect between the science and engineering of macroeconomics should be a humbling fact for all of us working in the field. ... Just as the world needs both scientists and engineers, it needs macroeconomists of both mindsets.”

The widespread illiteracy in national accounting among researchers should therefore be regarded as a threat to economics as an empirical and policy relevant science.

Economic researchers and their textbooks educate those that become later users of national accounts statistics, e.g. policy-makers, journalists, financial analysts and teachers in economics. A common complaint of these courses is the treatment of national accounting: national accounts statistics are important for their jobs, but have been insufficiently discussed during their courses in economics.

The same applies to administrative concepts, like those in business accounts, government accounts and concepts of taxable business and household income. Understanding these administrative concepts and their relationship with the national accounts and economic theory is very important for a proper use of national accounts statistics and for meaningful applied economic analysis. For example, financial markets and managers of corporations are likely to react on annual or quarterly profits before and after tax and much less on theoretically superior notions of expected net return based on a proper valuation of risk and uncertainty. Similarly, governments are affected by figures on government deficit and debt (and much less on a complete balance sheet of the government or sophisticated calculations of sustainable public finance) and the supply of labour is influenced by (marginal changes in)

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<sup>3</sup> JEL-code E Macro-economics and monetary economics has been expanded with E01 Measurement and data on national income and production accounts and wealth.

administrative concepts of (taxable) income. Such important administrative concepts may also be improved by the input from economic theory.

National accounting has become a profession separate from economic theory and econometric model building. However, also national accountants often do not speak their own language fluently: many have problems in understanding the logic, merits and limitations of their own concepts. Even the most famous example to ridicule the national accounts, ‘marrying your housekeeper reduces national income’, seems not to be common knowledge anymore.

In their daily work, national accountants generally focus on compiling statistics. Compiling them timely and in an efficient and reliable way is already a very complicated and a challenging task. Explaining the concepts to data users and investigating their relevance for various types of data needs is usually not a priority. They are also often not fully aware of the many different and specific ways in which national accounts concepts and statistics are actually employed by the widely different types of users, e.g. researchers and politicians. As a consequence, giving adequate guidance to such data users becomes then also quite difficult.

The scope and variety of national accounts statistics published world wide is drastically expanding and the concepts become much more complex and subtle. This increasing complexity partly reflects a growing complexity in economic reality, e.g. all kinds of new financial instruments and mixes of public and private insurance and even more global production processes and financial markets. The increasing scope, variety and complexity of national accounts makes the problem of illiteracy in national accounting even more severe.

### *Central thesis*

This book’s central thesis is that official national accounts statistics are insufficiently serving specific data needs and have become incomprehensible and inaccessible for most data users. Three major causes can be distinguished:

1. The current universal guidelines are in general well designed and well founded, but there is still considerable room for improvement, in particular by a better link to specific uses and by taking more account of economic theoretic concepts.
2. The producers of national accounts statistics hardly disclose any information on the reliability of national accounts statistics, the concepts actually employed and their implications for various uses.
3. The users of national accounts statistics generally lack the knowledge and skills to use national accounts statistics properly and to serve as critical consumers.

### *Purposes*

This book serves two purposes. The first purpose is to reduce illiteracy in national accounting by clarifying to outsiders and insiders what is measured by official national accounts statistics, how it is measured and how it is used. The second purpose is to show how the national accounts and its use should be developed further. Meeting these purposes implies that the enormous gap between the users and the producers of the national accounts is bridged. This can then result in better economic research, better economic policy and more effective and efficient national accounting concepts and statistics.

## 1.2 The approach in this book

The book consists of three parts.

### *Part I: The development of the national accounts*

In the first part, the historical backgrounds of the present national accounts are described. Chapter 2 provides an overview of the developments from the seventeenth century unto the Second World War. This overview –in particular that on the early estimates- is to a great extent based on the work of Studenski (1958). The unique qualities of this book have made it a part of the history of the national accounts itself. Immediately after the Second World War, the first international guidelines on national accounting were issued. This started a new era in national accounting, an era dominated by international guidelines. In chapter 3 the conceptual developments since the Second World War are described, while chapter 4 is devoted to the developments of the national accounts as a statistic. This historical part serves as a general introduction to the major issues in national accounting.

### *Part II: The national accounts as a tool for analysis and policy*

In the second part of the book, the logic, merits and limitations of the present national accounts are investigated. Chapter 5 provides a general view on the national accounts. It clarifies in a general way the relationships with the real world, economic theory, administrative concepts, data sources and the various uses. According to this view, the accounting framework recommended by the international guidelines serves as a universal model underlying official national accounts statistics all over the world.

In chapter 6, this universal national accounting model is described and discussed. The model is explained starting from a set of simplified real-world national accounts statistics ('Polderland-statistics'). These statistics are presented and discussed for eight different perspectives (the national economy as a whole, non-financial corporations, financial corporations, government, households, Rest of the World, industries and other perspectives). Each of these perspectives reflects a major group of data needs. The Polderland-statistics comply with the concepts and tables in the new guidelines, but contain already many suggestions for improving the standard presentations and deriving alternative concepts. The standard concepts are discussed in view of their internal logic (the logic of the standard accounting framework) and in view of economic theoretic and administrative concepts. This reveals the various choices underlying the standard concepts and clarifies their relevance for various data needs. The discussion results also in proposals for the next SNA.

What is actually measured by national accounts statistics does not only depend on the universal model. It depends also on the data sources used and the national measurement process. They determine whether national accounts statistics are actually based on observations, assumptions or mere fabrications. For most fellow-statisticians and users of the national accounts compiling the national accounts is a black box; some label the compilation process even as obscure and non-scientific ("a voodoo ritual"). In chapter 7 the art and craft of compiling national accounts statistics and their implications for reliability is clarified.

National accounts statistics serve different roles, e.g. object of analysis, tool for analysis and tool for private and public decision-making. In chapter 8, the merits and limitations of national accounts statistics are investigated for these various roles.

### *Part III: The future of the national accounts*

The third part of the book explores the future of the national accounts. Data needs and data possibilities are changing dramatically due to trends like globalisation, more market-oriented government and automation. Chapter 9 investigates whether these changes should be regarded

as threats to the national accounts or as opportunities. A blueprint for the national accounts in the 21<sup>st</sup> century completes this look into the future. Chapter 10 presents a programme of work for drastically improving the national accounts and transforming it into a modern tool of information.



## **PART I.**

# **THE DEVELOPMENT OF THE NATIONAL ACCOUNTS**

*From incidental estimates to a universal tool for  
analysis and policy*



## 2. NATIONAL ACCOUNTING FROM THE SEVENTEENTH CENTURY UNTO THE SECOND WORLD WAR

*National accounting for specific purposes*

### 2.1 Introduction

In the second half of the seventeenth century, the history of national accounting started by some early estimates of national income. This is the period in which mercantilism started to decline, the first germs of liberal economic thought were popping up but where Adam Smith's *Wealth of Nations* is still 100 years to go. The early estimates are discussed in section 2.2<sup>4</sup>.

For national accounting, the 1930s and 1940s proved to be revolutionary decades in terms of the role and uses of national accounts, e.g. the discovery of input-output analysis, purchasing power parities, macro-econometric modelling and the Keynesian revolution in economic thinking. These decades were also a revolution in terms of the development of national accounting concepts and methods. This period is the topic of section 2.3. A summary of the developments unto the Second World War is provided by section 2.4.

### 2.2 The early estimates: from 'Political Arithmetick' to 'Social Accounting'

The origins of the present national accounting systems can be traced back to the first national income estimates by Petty and King in, respectively, 1665 and 1696<sup>5</sup>. At roughly the same time, in France estimates of national income were made by Boisguillebert and Vauban. It is not certain whether these estimates were influenced by the estimates in England. The estimates by Petty and King were unique milestones as they were not equalled in scope and quality in the next two hundred years(!); the only exception were the estimates by their 'intellectual debtor' Davenant in 1698 (see Studenski, 1958, p. 40).

#### *Petty and King*

In common with all early estimates of national income, the estimates of Petty and King were practical and directed at concrete policy issues. Petty "wanted [firstly] to prove mathematically that the State could raise a much larger revenue from taxes to finance its peace and wartime needs, and that it could do so by more equitable and less burdensome forms of taxation ... Secondly, Petty wanted to disprove once and for all the notion that England had been ruined by the Revolution and foreign wars and was no match, either militarily or commercially, for Holland and France" (Studenski, 1958, p. 27, 28). King also draws clear political conclusions from his estimates:

"the Warr cannot well be sustain'd beyond the year 1698 upon the Foot it now stands, unlesse

1. The Yearly Income of the Nation can be Increas'd.
2. Or the Yearly Expençe Diminish'd.
3. Or a Forreign or Home Credit be Obtain'd or Establish'd.
4. Or the Confederacy be Inlarg'd.

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<sup>4</sup> For a fuller account, we refer to Studenski (1958); about early English estimates, see also Stone (1997). Maddison (2003 and 2005) provides a historical overview mainly restricted to the measurement of economic growth.

<sup>5</sup> These estimates were published later: Petty's estimates were in 1691 and those of King in part by Davenant in 1698 and in full not until 1802.

5. Or the State of the Warr Alter'd.
6. Or a General Excise, in effect Introduced." (King, 1936, p. 47).

Nevertheless, Petty as well as King recognised also the more general advantages of estimating national wealth and income. King states that information on a country's wealth and population is a "Piece of Political Knowledge, of all others, and at all times, the most useful, and Necessary" (King, 1936, p. 13). Petty went even further by advocating that in socio-economic discussions "no word might be used but what marks either number, weight, or measure" (Studenski, 1958, p. 27).

The estimates by King can be regarded as improvements on those of Petty. We will shortly discuss the three main features of King's estimates.

Like the estimates of Petty and the earliest estimates in France, King employs a *comprehensive concept of production and income*. This concept is still used in the current international guidelines. According to this concept the production of goods as well as services generates income.

The second important feature of the estimates by King is that they already represented the three ways of estimating domestic product: net production, distribution of income and expenditure. The estimates of Petty and most estimates up till the 1930's only covered one or two ways.

The third important feature of the calculations by King was their remarkable coverage. He presented not only the total annual national income, expenditure, and saving, but also their distribution by social and occupational groups, a breakdown of national income by type of income and an estimate of wealth (gold, silver, jewels, furniture, livestock, etc.). Like Petty, King provided a comparison of the national incomes and wealth of England, Holland and France. International comparison, which is a major objective of the international guidelines, was therefore already present in Petty's and King's pioneering estimates. King's estimates contained also time series of the period 1688-1695 of national income, expenditure and taxes received.

The fourth important feature of King's work is that he used his time series to forecast income, expenditure and tax revenue for the years 1696, 1697 and 1698. This type of use of national accounting figures dates therefore also back to the earliest estimates of national income.

From a modern perspective, the major limitation of King's work is that all estimates are in current prices. The first price index numbers were invented only some years later by Fleetwood (1707)<sup>6</sup>. However, the idea of deflating national income is much more recent and originates from Lowe in 1823 (see Studenski, 1958, pp. 107-109).

Lowe used his national income estimates to calculate the tax burden. He related them to the taxable income remaining after deducting the subsistence incomes that could not bear any taxation. He did this for the national incomes of specific years in the preceding three decades, calculated first at current prices and next at prices of 1792. Lowe devoted considerable space to the effects of inflation on fiscal policy. He was particularly concerned over the increase in the burden of public debt on the shrinking money value of national income. He proposed that

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<sup>6</sup> The issue addressed by Fleetwood was the interpretation of values in old statutes, entitlements, laws and regulations (see Stone, 1997, 117-140). For example, according to fifteenth century college statutes in Oxford, a fellow should vacate his fellowship if he came in possession of an estate by inheritance or of a perpetual pension worth of 5 pounds per year. According to Fleetwood, corrections should be made for all price changes during the past two centuries. He also mentioned similar problems with the fines for stealing mentioned in old laws and the level of income which entitled to vote in parliamentary elections. To translate such figures into current prices of several centuries later, he provided an overview of price changes for five commodities (wheat, oats, beans, ale and cloth) and recommended to calculate an unweighted index of average price change.

the government enact a tabular standard that would control the value of money and the payments of interest and wages. This tabular standard was to be based on the “power of purchase” of money in terms of basic commodities and could be applied on a voluntary basis.

For calculating national income, King used net product estimates for agriculture, i.e. he deducted from the revenues of the crop the expenditure on the seeds. However, he did not systematically use value added as a concept. This concept originates from Young (1770; see Stone, 1997, pp. 141-181). For calculating value added in agriculture, Young did not only deduct the costs of seed, but also costs of maintenance and repair, e.g. of buildings, vehicles and horses.

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**Table 2.2.1 Major events in the early estimates of national accounting**

Year	Event
1660-1710	First national income estimates; in England by Petty, King and Davenant; in France by Boisguillebert and Vauban
1707	First index-numbers by Fleetwood
1760	Tableau économique by Quesnay: economic accounts used as a primitive growth and general equilibrium model; precursor of input-output tables
1770	The concept of value added invented by Young
1790-1800	First national income estimates in Russia
1798-1804	First national income estimates in the Netherlands
1805	First national income estimate in Germany
1823	First national income estimates in constant prices by Lowe
1843	First national income estimates in the USA
1886	First official national income estimates by the government (Australia, Coghlan)
1860-1900	First national income estimates in Austria, Australia, India and Greece
1915	W.I. King (USA): one of the last national income estimates with clear policy conclusions
1920	The economic consequences of the peace by Keynes: using national accounts statistics to assess the dramatic economic consequences of a major political agreement
1920-1930	Private institutions publish national income studies, e.g. university institutes in Sweden and Norway, USA: Brookings Institutions, NBER, National Industrial Conference Board; Austria WIFO;
1925-1940	More official national income estimates (e.g. Greece, Canada, Soviet Russia, Germany, Netherlands, New Zealand, USA and Turkey)

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### *Vauban*

In France, at the start of the eighteenth century, Vauban proposed a major tax reform (see Studenski, 1958, pp. 55-60). Most of current taxes were to be abolished, as they were inequitable—the small incomes carried nearly all the tax burden—and responsible for poverty. They should be replaced by an income tax, levied at a uniform rate of 5% to 10%, depending on general economic conditions. The income tax should consist of two parts: a levy in kind on agricultural produce and a levy on all money incomes, i.e. on the rent of houses, profits of businesses and grain mills, the operation of public properties, wages, pensions and the fees of government offices. In addition to the income tax, current taxes on salt, postal charges, customs duties and taxes on luxury goods like tea, coffee, chocolate, brandy and gilt coaches should be retained and a tax on wine, cider and beer consumed in public house should be added.

He then estimated the potential revenue of his tax reform. To this end, he made an estimate of the major elements of French national income, but did not present an estimate of

total French national income. He was also not aware of the need and fairness for tax purposes of distinguishing between the gross and net value of agricultural production.

Vauban was a military engineer world famous for his fortifications and tactics for attacking and defending them. He was decorated by the French king Louis XIV with every conceivable order of distinction. He made his proposals for tax reform after his retirement. However, these proposals were not all appreciated by the ruling class. At the court, Vauban fell therefore into disgrace and he died some months later.

### *Quesnay's zigzag diagram*

In 1758, nearly one century after the estimates by King and about half a century after the estimates by Vauban, Quesnay published his zigzag diagram (see Meek, 1963 and Spiegel, 1983, pp. 189-192). Its purpose was “to construct a fundamental Tableau of the economic order for the purpose of displaying expenditure and products in a way which is easy to grasp, and for the purpose of forming a clear opinion about the organization and disorganization which the government can bring about” (Translation by Meek, 1963, p. 108).

The zigzag diagram shows successive rounds of revenue and expenditure by farmers (“the productive class”), landlords (“the mixed class”) and artisans (“the sterile class”)<sup>7</sup>. In the first round, the landlords spend 2 thousand livres: 1 thousand livres on farm products and 1 thousand livres on manufacturing products. The farmers spend 5 hundred livres on own produce (e.g. as seeds and food) and 5 hundred livres on manufacturing products of the artisans (e.g. machinery, pottery, clothing). They are assumed to produce with these inputs 2 thousand livres on farm products. The net revenue over the production costs is thus 1 thousand livres. This surplus accrues to the landlords as rent on land or as interest on advances. The artisans spend 5 hundred livres on farm products (e.g. food) and 5 hundred livres on manufacturing products. The artisans are assumed to be not productive (“the sterile class”), i.e. the value of their output is equal to the value of their inputs and they do not generate a net surplus.

In the second round, the net surplus of 1 thousand livres is spend by the landlords in the same proportion as in the first round. This second round generates a surplus of 5 hundred livres. After approximately twelve rounds, each of the two working classes has reproduced its subsistence income; in addition, the farming class has produced another net revenue of 2 thousand livres for the landlord.

Quesnay's zigzag diagram can be interpreted as an input-output table for a closed economy<sup>8</sup>. This is shown in table 2.1. The farmers produce agricultural products with a value of 5 and the artisans produce products with a total value of 2 (see the first two columns). The farmers' intermediate inputs are agricultural products (1, e.g. seeds) and manufacturing products (1, e.g. pottery). The value added is 3: subsistence income is 1 and the net surplus of 2 accrues to the landlords. The artisans' intermediate inputs are only manufacturing products (1). The value added is 1 which consists fully of their subsistence income. All the income (value added = subsistence income and net surplus = 4) is spend on agricultural products. In this way, the use of agricultural products is equal to the supply of agricultural products (= output = 5). The same applies to the supply and use of manufacturing products.

<sup>7</sup> There are several versions of the zigzag diagram.

<sup>8</sup> This was first demonstrated by Phillips (1955). He showed that a particular form of the Tableau (the so-called formula form) could be transcribed into a closed Leontief-model. Our presentation is different and inspired by the supply and use tables in the current international guidelines on the national accounts (SNA93 and ESA95).

Table 2.2.2 Quesnay's zigzag diagram presented as an input-output table						
	<i>Inputs of production</i>		<i>Final consumption</i>			<i>Total</i>
	Farmers	Artisans	Farmers	Artisans	Landlords	<i>Use</i>
Use of agricultural products	1	0	1	1	2	5
Use of manufacturing products	1	1	0	0	0	2
Subsistence income	1	1				
Net surplus	2	0				
Output at basic prices	5	2				
P.M. The net surplus of farmers accrues to landlords and						
all income (subsistence income & net surplus) is spent on agricultural products						

In later editions, Quesnay's zigzag diagram becomes more complex: the mixed class contains next to landlords also other social groups like the clergy and soldiers. Their revenue does not only constitute of rent on land or interest on advances but also of taxes. The latter can be used to pay for public services provided by landlords, the clergy and the soldiers.

The ratios and rates of return in the diagram were no random figures, but drawn from detailed calculations made by Quesnay in earlier articles. The artisans were considered to be a sterile class, because the physiocrats observed that manufacturing and commerce only generated a (substantial) net surplus in case of clear monopolies.

Quesnay's *Tableau économique* was used as a primitive growth model that served to promote the idea that agriculture and not merchandising or manufacturing is the engine of economic growth<sup>9</sup>. According to the physiocrats, investments in agriculture should therefore be promoted, taxes and interest rates for agriculture should be reduced and tolls and other restrictions on trade in agricultural products should be abolished. The table also served to argue that the most efficient way of taxing is to directly tax the group that ultimately pays the tax, i.e. the landlords instead of the farmers or the artisans<sup>10</sup>. The table was therefore also a simple general equilibrium model.

Quesnay's *Tableau économique* is a clear economic accounting model. As such it can be regarded as the first precursor of both the input-output tables and the sector accounts. The estimates by King and Petty were systematic, but did not stress the circular flow of income and expenditure and the interactions between socio-economic groups.

### *Smith*

Adam Smith who had clear reservations about Political Arithmetick, in particular because he doubted "the exactness of ... these computations" (Smith, 1776, Book IV, chapter V, part b, paragraph 30). Nevertheless, for some purposes, Smith deemed the calculations sufficiently accurate. For example, he suggested to stimulate the supply of corn for the home market and the domestic production of corn by stimulating the inland corn trade and not by influencing foreign trade, because "the proportion of ... grain imported into Great Britain to that of ... grain consumed, it has been computed ... , ... does not exceed that of one to five hundred and seventy" and "the importance of the inland trade must be to that of the exportation trade as thirty to one" (Book IV, Chapter Vb, paragraph 29).

For three quarters of a century, Smith was very influential in his argument that labourers in agriculture as well as in manufacturing, commerce and the transportation of goods were to

<sup>9</sup> On the interpretation of Quesnay's *Tableau économique* as a growth model, see Eltis (1984), in particular the first two chapters.

<sup>10</sup> However, the physiocrats were certainly not enemies of the landlords, as they also argued that the net surplus of agriculture should be sufficiently high (e.g. by raising the prices of agricultural products) to pay the taxes and to give them sufficient income.

be regarded as 'productive'. However, unlike King, he still rated "the whole civil and military personnel of government, the professions, the domestics, and others engaged in the performance of personal services and the services of dwellings" (Studenski, 1958, p. 19) as unproductive labourers. "He considered the national product to be constituted solely of commodities, and the national income ... to be composed of wages, rent and profit (including interest) derived from the production of these articles" (Studenski, 1958, p. 19). Smith's view was supported by among others Ricardo, Malthus, James Mill and John Stuart Mill, but became increasingly subject to criticism by, e.g., Say, McCulloch, Senior, Walras and Marshall.

At the end of the nineteenth century, it appeared that Smith's material concept of production had received the final blow. But more than a half century later, this concept formed the basis of the Material Product System (MPS69), that is the accounting conventions used in the communist countries (see further sections 3.2 and 3.3). Studenski (1958, p. 22) argues that the MPS69 is based on the ideas of Marx, and, more in particular, based on a mistaken interpretation of it. However, it could also be argued that they are based on the ideas of the intellectual father of capitalism, i.e. Adam Smith.

### *The slow start of political arithmetic in the Netherlands*

Political arithmetic had a surprisingly slow start in the Netherlands<sup>11</sup>, by far the richest country in the world<sup>12</sup> in the seventeenth century. In 1798, on request of the national assembly of the new Batavian republic, Hora Siccama and van Rees made a plan for revising the tax system. Their task was to investigate how taxes could be levied efficiently, in proportion to personal wealth, with as low as possible tax rates and sufficient for financing government expenditure. Estimates of national income, government expenditure and current and potential tax revenue were included in the plan. The plan, including a proposal for introducing personal income and wealth tax, was not executed due to a revolt and a change in government.

In 1804, Metelerkamp published a study of 600 pages on the economic and military power of the Batavian republic over the last fifty years and in comparison with seven other countries (Great Britain, France, Russia, Prussia, Sweden, Denmark and Saxony). The study was published in Dutch and also translated in French. He compared the size of the country, the number of inhabitants, national income, national wealth, imports and exports, income and outlay of the government, government debt and the number of soldiers and warships. However, the comparison of national income was limited to the Netherlands (including Belgium), Great Britain, France and Saxony.

Metelerkamp's study was a reaction to the pessimistic mood in the Netherlands: people thought their country was in decline, full of debt, loosing morale and fighting spirit and with shrinking revenue from international trade and colonies (Metelerkamp, 1804, Introduction, part I). He wanted to investigate whether facts corroborated these feelings and opinions and what policies should be pursued. He concluded that:

- The example of Russia shows that government should interfere at least as possible with domestic trade (hunting, fishing, farming, craftsmanship and commerce); this stimulates employment, income and the supply of products.
- Dutch welfare did not decline during the past fifty years; some sources of income declined indeed, but were compensated by the increase in other sources of income;

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<sup>11</sup> On the history of the Dutch national accounts, see Bos (2006a).

<sup>12</sup> In 1700, Dutch GDP per capita was 70% higher than that of England and 130% higher than that of France (see Maddison, 2003, p. 58-59).



- Welfare in other European countries increased. This implied a relative decline of Dutch welfare. However, Dutch welfare still surpasses welfare in other European countries.
- During the last century, government revenue increased in other European countries much more than in the Netherlands. Relatively low taxes may have been the reason for the much more rapid increase in Dutch government debt. However, the tax burden in the Netherlands is now excessive and will in the long run certainly ruin the economy.

The relatively slow development of Dutch ‘political arithmetick’ is surprising considering the dominant role of Dutch republic in trade and science<sup>13</sup> in the seventeenth and eighteenth century. A related surprising fact is the very limited development of economic theory in the Netherlands compared to England and France. How can it be that the scientific revolution in the seventeenth century, in which experimentation and measurement played a major role, flourished in Holland, England and France, stimulated economic thinking and measurement in England and France but did not in Holland? How can it be that the by far richest country in the world did not develop sophisticated economic thinking and measurement?

Van Zanden<sup>14</sup> suggests that the richness of Holland and the decentralized state may explain this puzzle. The very favourable position of Holland and its decentralized form of government in the seventeenth century did not stimulate economic thinking and measurement. In contrast, in England and France the relatively backward position was regarded as a problem. Mercantilism with its policies of protection, government intervention and privileges for merchants and traders was first offered as a solution. However, these policies were not effective. Economic thinking and measurement in England and France were then in particular motivated by arguing against mercantilism and in favour of Dutch policy and institutions. According to Petty, Dutch institutions favoured economic growth. Religious tolerance encouraged skilled immigration. Economic enterprise was stimulated by clear property rights, an efficient legal system, sound banking and limited restrictions on international trade. Taxes were high but levied on expenditure rather than income. This encouraged savings, frugality and hard work (see Maddison, 2003, p. 80).

The negative influence of the decentralized government on data need is well explained by Klep and Verheusen (2002, p. 220): “As a consequence of the very loose federal nature of the Republic ... there was almost no ‘national’ organised control of the country that could have created a system of national measured data. There was nothing like the French system of regional statistics that would inform the centre about local conditions around the country in a systematic way. Most Dutch control was exerted in provincial and urban political bodies with high levels of autonomy. At the same time, power was increasingly concentrated in the hands of a closed patriciate. Therefore, ... the Dutch culture of control can be characterised as decentralised, segmented, and informal. Measured data mattered little unless this information pertained to financial problems; moreover, even when such data did exist they were kept secret. During the eighteenth century institutional change and social policy were not a characteristic of this country, and could therefore not inspire government statistics, apart from a handful of fiscal reorganization in certain provinces. ... The Batavian revolution of 1795 ... created a national political and scientific space as well as a great need for national information in which statistics could develop.”

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<sup>13</sup> Internationally famous scientists living and working in Holland were e.g. Huygens, Descartes, Swammerdam, van Leeuwenhoek and Linnaeus.

<sup>14</sup> He gave this explanation in a email to the author.

A supplementary explanation for the slow development of Dutch national income estimates is provided by Fritschy<sup>15</sup>. A general income tax was not being considered in any of the Dutch provinces. For discussing tax policy, national income estimates were thus irrelevant.

The first Dutch estimates, by Hora Siccama and van Rees in 1798, by Keuchenius in 1803 and by Metelerkamp in 1804, support these explanations. At the end of the eighteenth century, the Netherlands had lost most of its economic power, international trade was ruined by England, government debt had grown rapidly due to the successive wars and the republic became more a centralized state. These changed circumstances raised questions about economic performance, sustainability of government finance and the design of the tax system. This stimulated the development of national income estimates.

#### *Keynes' The economic consequences of the peace*

Directly after the first world war, Keynes wrote "The economic consequences of the peace" (Keynes, 1920). This polemic made him instantly world-famous. He was the official British representative at the start of the Paris Peace Conference, but resigned when it became evident that there was no hope for substantial modification of the draft terms of peace. He attacked the peace-treaty and the reparation payments imposed on Germany for not taking into account facts and economic logic.

On the basis of all kinds of statistics on national wealth in e.g. Belgium, France, Great Britain and Serbia, he estimated that the treaty implied that Germany had to pay the various allied powers 2 billion pound for direct war damage<sup>16</sup> and 5 billion for pensions and allowances. He also calculated that Germany's capacity to pay was not sufficient for this. Transferable wealth (e.g. gold, silver, ships and foreign securities) was only about 0.5 billion pound and the rest had therefore to be paid over a number of years out of the net revenue from exports. However, considering the loss of major parts of former Germany (e.g. Alsace-Lorraine) and the loss in capital stock (e.g. ships, livestock, wear and tear due to lack of repair), the transferable part of national income would be less than 0.1 billion pound per year. He proposed to limit Germany's reparation payments well within her capacity to pay, to ensure a fair distribution of coal and iron and to establish a free trade union under the auspices of the League of Nations. Only in such a way, the European economy could be revived, avoid the perils of mass inflation and ensure a proper standard of living for the whole population.

Keynes' polemic could be regarded as a revolt of economics against politics and in this revolt national accounts statistics played a major role. It is still a major example of the use of national accounts statistics for (economic) policy analysis. It marked a radical shift in Keynes thought and its prophetic lessons were learned after the second world war, e.g. the Marshall aid and the European union. All these developments turned out to be very important for national accounting (see chapter 4).

#### *The spread of the idea of estimation national income*

In the period from King till the 1930s, the idea of estimating national accounting figures spread over many countries and the number, frequency and timeliness of the estimates increased. In 1900, national income estimates had been constructed for 9 countries (England, France, United States, Russia, Austria, Germany, Australia, Norway and the Netherlands). In 1930, this number had increased to 23 and by 1940 the number had climbed to 33. The

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<sup>15</sup> Explanation provided by email to the author. She also pointed out the existence of the estimates by Hora Siccama and van Rees. These estimates were not mentioned in earlier overviews, like Den Bakker (1994).

<sup>16</sup> Considering that much guesswork was included, he argued that the amount would certainly be between 1.6 billion pound and 3 billion pound.

compilation of annual estimates by the government was another development. This occurred for the first time in 1886 in Australia and for the second time in 1925 in Canada. In 1933, the number of countries had increased to 6: adding then Soviet Russia, Germany, the Netherlands and New Zealand. At the end of the 1930s official estimates were also available for the United States, Turkey, Yugoslavia and Switzerland (see Studenski, 1958, p. 156).

All early estimates of national income were practical and directed at concrete policy issues; this was a common feature of national income studies up to the 1920's. The study by W.I. King on the size, sources and distribution of income and wealth in the USA (King, 1915) can be regarded as one of the last national income estimates combined with economic and political interpretation<sup>17</sup>. The policy issues addressed by these early estimates were national economic power and performance, poverty, unfair and inefficient taxation and sustainability of public finance. Often, several of these issues were discussed and the national accounts approach was essential for demonstrating that the various issues were intimately linked.

War, substantial economic decline and wide-spread poverty were circumstances that stimulated the early estimates. Also the availability of census data or income tax data was important; this partly explains the dominant role of the English estimates.

The ruling class was often not very happy with the national income estimates and the accommodating proposals for reform. Early national accountants were sometimes exiled (e.g. Radishchev in Russia) or fell into disgrace (e.g. Vauban in France); others may have feared the consequences of publishing their work and left it therefore unpublished. However, in the twentieth century -probably linked to advancements made in democracy- estimating national income became gradually to be perceived as a task of the government.

In many countries, also private institutions took the responsibility of regularly compiling national accounts statistics and producing national income studies. Examples are university institutes (e.g. in Sweden and Norway), economic research institutes (e.g. NBER, Brookings Institution and National Industrial Conference board in USA, Mitsubishi Economic Research Institute in Japan and WIFO in Austria<sup>18</sup>) or private and central Banks (e.g. the Bank of Nova Scotia in Canada). Such institutions reflect the interest of researchers, business, banks, pension funds and trade unions in national income estimates. They need such information for analyzing and monitoring the economy, calculating market shares and deciding on investment, loans, mortgages and wage negotiations.

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<sup>17</sup> The study focused on providing facts to answer questions like "If wealth and income are increasing, is not population increasing faster? Is not the increase of wealth recorded in the statistical reports of our government merely an illusion arising from fluctuations in the supply of the medium of exchange? If there has been an increase in the riches of the nation as a whole, has the increase been distributed to all classes of the population, or have the benefits been monopolized by a favored few? Are the landlords, the capitalists, the captains of industry, or the wage earners receiving the principal share of the fruits of progress?" (King, 1915, p. 2). It also gives clear policy advice against unlimited immigration in the USA: "The working man in this country is far more prosperous than in most nations of the globe ... But ... the lot of the unskilled labor ... is a hard one ... the real wage of labor can be kept up only by protecting our workmen directly against foreign importations of labor. Without such safeguards, there seems to be no reason to suppose that we can prevent the wage level in the United States from settling gradually down to that of Europe. This would mean a ruthless cut in wages ... and the forcing down of unskilled labor to a mere subsistence level, ... turning back a century or more the hands of progress. Against the continuance of such a ruinous policy, it has become the duty of every patriotic American to register an vigorous protest." (King, 1915, pp. 205-207).

<sup>18</sup> The WIFO was founded in 1927 by von Hayek and von Mises.

### 2.3 Revolutionary decades (1930-1950)

The period 1930-1950 turned out to be revolutionary decades for national accounting. Major features of this transitory period are:

- The start of official and regular national accounts statistics in a limited number of countries. These statistics were not directed at concrete policy issues, but were intended to provide information relevant more in general for policy and analysis.
- Invention of many new applications and uses of the national accounts approach, e.g. the Keynesian revolution in economic theory and policy, input-output analysis and econometric modelling.
- Revolution in national accounting concepts and methods, e.g. the birth of the first modern national accounting systems;
- Political and economic circumstances favouring a national accounts approach in policy and analysis (economic crisis of the thirties, the end of the gold standard, the second world war and the need for recovery afterwards).

#### *Major changes in uses*

In the period 1930-1950, national accounting was drastically transformed. It was a revolution in terms of the use of the national accounts (see table 2.3). Most of these new uses also reinforced each other. These uses were also closely linked to the economic circumstances: the economic crisis of the thirties, the second world war and the need for recovery afterwards stimulated an active role of the government. National accounts statistics turned out to be very useful in such circumstances for analyzing, monitoring, forecasting, discussing and planning the national economy.

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**Table 2.3 New applications and uses of the national accounts during 1930-1950**

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New application or use	Who?
Purchasing power parity: international comparison of real income	Clark
Systematic analysis of long term growth by using national accounts time series	Kuznets
Input-output analysis	Leontief
Econometric modelling of national economies	Tinbergen and Frisch
Keynesian revolution and the birth of macro-economics	Keynes
Analysing public finance in a macro-economic framework	Meade and Stone
Monetary policy linked to national income instead of gold	
Analysing balance of payments in a macro-economic framework	Meade

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#### *Clark and Kuznets*

Colin Clark (see e.g. Clark, 1937 and 1940) introduced purchasing power parities and showed how to make international comparisons of real income. He also demonstrated how to make intertemporal comparisons. He even made a comparison between the level of well-being in the ancient world (Egypt, Greece and the Roman Empire at the peak of their powers) and that in the nineteenth century and the first half of the twentieth century! The influence of Clark's estimates was notable in, for example, the constant price calculations for the Netherlands in 1948. In the latter, the choice of the base year was the same as that in Clark (CBS, 1948, p. 50).

Simon Kuznets<sup>19</sup> (see e.g. Kuznets, 1941) reconstructed national income and product accounts for the USA, first back to 1919 and eventually back to 1869. Such impressive measurement exercises were the input for investigating business cycles and long term economic growth. For example, what was the role of the various industries, what was the role of technology and innovations, what is the relationship between economic growth and inequality (the U-shaped Kuznets-curve) or between economic growth and urbanization, traffic congestion and pollution. These examples also illustrate that Kuznets was very well aware of the major differences between economic growth and welfare. According to Kuznets “As a general formula, the desirability of as high and sustained a growth rate as is compatible with the costs that society is willing to bear is valid, but in using it to judge economic problems and policies, distinctions must be kept in mind between quantity and quality of growth, between its costs and return, and between the short and the long run”<sup>20</sup>.

#### *Input-output analysis<sup>21</sup> and commodity-flow accounting*

Leontief developed input-output analysis, estimated detailed input-output tables for the USA and applied this new tool to all kinds of problems. For example, he estimated the resource costs of conversion to peace time production in 1945. “How will the cessation of war purchases of planes, guns, tanks, and ships ... affect the national level of employment? How many new jobs will be created by the consumers’ demand for an additional one million of passenger cars, how many of these jobs can be expected to be located in the automobile industry itself, and how many in other industries such as Steel and the Chemicals, the Coal and the Petroleum industries? How much additional freight traffic and revenue can the American railroads expect to derive from every billion dollars worth spent on post-war housing construction?” (Leontief, 1941, p.141). By calculating the relative factor intensities of imports and exports he discovered the Leontief paradox: why are American exports labour intensive, while American imports are capital intensive? On behalf of the United Nations, he developed a world input-output model with the environment as an “economic sector”. He used the model to study the environmental impact of expanding production as well as how to get more economic growth with limited additional environmental pollution.

For his seminal work on input-output analysis, Leontief was later awarded the Nobel Prize. Input-output analysis started not fully out of the blue. Precursors can be found amongst other things in Quesnay's zigzag diagram (“Tableau Economique”)<sup>22</sup> and some of the equations relating input and output by Walras (see Stone, 1984). The crucial innovation contained in Leontief's article was that it formulated for the first time a "model connecting inputs and output, which made it possible to calculate indirect as well as direct inputs and thus to carry out the many, now familiar, analyses which depend on being able to do this" (see Stone, 1984). The formulae for calculating the cumulative indirect effects is therefore labelled the Leontief-inverse.

Commodity-flow accounting can be regarded as the statistical counterpart of input-output analysis, as commodity-flow accounts are a type of input-output table. Commodity-

<sup>19</sup> About Kuznets and his work, see e.g. Carson (1975) and Lundberg (1984).

<sup>20</sup> Kuznets in the New Republic 1962, quoted by McDowall, 2008, p. 173.

<sup>21</sup> See also Baumol (2000), Kurz and Salvadori (2000) and Pressman (2006, pp. 217-229).

<sup>22</sup> Quesnay was a source of inspiration for Leontief: “The statistical study presented in the following pages may be best defined as an attempt to construct, on the basis of available statistical materials, a Tableau Economique of the United States for 1919 and 1929. One hundred and fifty years ago, when Quesnay first published his famous scheme, his contemporaries and disciples acclaimed it as the greatest discovery since Newton's laws. The idea of general interdependence among the various part of the economic system has become by now the very foundation of economic analysis. Yet, when it comes to the practical application of this theoretical tool, modern economists must rely exactly as Quesnay did upon fictitious numerical examples.” (Leontief, 1941, p. 9).

flow accounting started in Sweden (Lindahl), Denmark (Kampmann) and the United States (Kuznets). In Sweden, the results of a ten-year project under the direction of Lindahl were published in 1937. In this monumental and well-thought out study, the inputs of industries were calculated by some form of commodity-flow analysis, i.e. as the sum of inputs received by that industry from other industries as computed from the production statistics of the other industries (adjusted for imports and exports). The Swedish study inspired work in Denmark by Kampmann on input-output tables, that included also estimates on national aggregates in constant prices<sup>23</sup>.

In the forties and fifties, input-output analysis was developed more fully and many of its applications were proved to be successful analytical tools. In the international guidelines of 1968, input-output tables were explicitly linked to national accounting (see sections 3.2 and 3.3).

### *Econometric modelling*

Tinbergen and Frisch pioneered in econometric model building covering the whole national economy. These models need national accounts data as an input and can be used to forecast the national economy or to analyse the economy and the consequences of alternative policy proposals.

In 1936, in advising the Dutch government, Tinbergen constructed the first econometric model of the business cycle covering the whole economy (Tinbergen, 1936). His stylized representation of the Dutch economy was not intended to detect the causes of the economic crisis in the Netherlands. Unlike religious socialists as van Cleeff, the socio-economic order was not a topic of study but taken as a given. The purpose was purely instrumental: to find the conditions which could bring about an improvement of the business cycle. He compared various policy measures, like devaluation, public works and reducing wages. His famous conclusion was that devaluation was the best policy. This was very much against the politics of the time, i.e. not only against the official policy of the government but also against the opinion of the socialist party.

At a meeting of the Dutch economic association also Tinbergen's method was ridiculed and labelled the 'night train'. According to professor Goudriaan, "we have been transported on the night train of his mathematical machinery, but I am convinced that one of the carriages has been uncoupled during the night and has brought us to a station that we would never have reached through realistic economic insights" (Jolink, 2003, p. 136).

Nevertheless, in September 1936, the guilder was devalued without the disastrous consequences that had been predicted by many. This contributed enormously to the reputation of Tinbergen and his new method.

Tinbergen's revolutionary model of 1936 was not based on a national accounting scheme, e.g. concepts like national income and final consumption by the government were absent. Nevertheless, it gave the development of national accounting in the Netherlands a head start. In order to provide a better empirical grounding to the econometric model, new and longer time series were needed and the quality of existing estimates was to be improved. This was the major reason for compiling new and better figures.

After the Second World War, the Central Planning Bureau (CPB Netherlands Bureau for Economic Policy Analysis)<sup>24</sup> was founded with Tinbergen as its first director. However, in the early years, there was no role for econometric modelling. The Dutch economy was in ruins and an extensive system of rationing of imports, consumption and investment was put in

<sup>23</sup> More information on these developments in Scandinavia can be found in Aukrust (1994, pp. 26-31).

<sup>24</sup> The unique role of the CPB in the Dutch fiscal framework is described in Bos (2007a). Overviews of the successive CPB models are provided by Barten (1991) and Don and Verbruggen (2006). For a general overview of the history of the CPB, see Passenier (1994).

force to make the most out of what was available. A more or less refined model implicitly assuming free interaction among the major economic variables was then of little use. Instead, a national accounting scheme ('the national budget') served as the overall framework to analyse supply and demand.

Starting from 1946, following UK-practice (see Meade and Stone, 1941) an update of this scheme was also included in the government's annual report on the government budget. In this way, the government budget was presented in a macro-economic framework.

In the CPB's Central Economic Plan of 1946 (CEP1946), first total production was estimated on the basis of the total number of labourers and their labour productivity while taking into account bottlenecks like the lack of capital in one branch or the lack of labourers in another branch. When the total supply of goods and services was known approximately, the demand for these goods and services was investigated for private consumption at subsistence level, other private consumption, restoration and investments and the government.

The methodology of the CEP1947 was quite different from the 1946 plan. It was much more detailed and was built up of separate plans made by governmental agencies for the various branches (e.g. textile, coal and metal). The separate plans were totalised, checked on their consistency and modified in order to bring them in line with the level of the estimated possibilities of consumption, investment, imports and exports. This use of a national accounting scheme for bottom-up planning fitted well with van Cleeff's ideas on planning. However, as recovery proceeded, the extensive rationing system was gradually relaxed. As a consequence, the modelling approach and taking account of economic behaviour became much more meaningful. Furthermore, a model could focus on addressing the major policy issues.

The first CPB-model was operational in 1953. It served as a basis for prediction and policy advice by the CPB for most of the 1950s. This was path-breaking, as modelling was elsewhere an academic exercise and considered as not suited for the work of official government institutions.

The 1955 model consists of 27 equations describing the major macro-economic aggregates as defined by the system of national accounts. Compared to the 1936 Tinbergen model, it takes a step forward in its compatibility with the national accounts, its use of cumulated cost shares from the 1938 input-output tables and in the explicit presence of policy variables. However, it scores lower because of the virtual absence of dynamics, the very limited price-quantity interaction and the somewhat weaker empirical basis.

The model was used to draft a table indicating the consequences of particular measures of economic policy ('a railway table'). For example, the effect of an indirect tax or wage increase on employment, investment, consumer prices and the current account of the balance of payments. The table enabled decision-makers to choose their favourite policy menu. The table reflects Tinbergen's new view on planning: policy makers should define the targets of government policy and a model should be used to investigate which instruments are the most effective and efficient in meeting these targets. This approach was extended and formalized in his book "On the theory of economic policy" (Tinbergen, 1952). This book stresses also that politicians should be aware that one policy tool can not serve to achieve two policy targets simultaneously. More in general: the number of policy tools should be at least as large as the number of policy targets.

Tinbergen's purely instrumental approach fitted very well in the Dutch pillarized society, where the four pillars (catholics, protestants, social democrats and liberals/free) all had their own organizations, like political parties, trade unions, employers' organizations, newspapers, sports clubs, schools and universities. After the Second World War, all pillars agreed that a national economic policy was required for economic recovery. This required

pillar and class neutral insights. The national accounts framework and Tinbergen's modelling approach provided these.

Tinbergen clearly saw the necessity of a quantitative description of the national economy in terms of large groups of people, goods, etc. (Tinbergen, 1936, p. 67), but he did not present concrete proposals for a social accounting system, i.e. an accounting system in which the role of the various economic and social actors are explicitly shown. In the Netherlands, this role was played by Van Cleeff (1941a, 1941b). In 1941, he presented a simple set of accounts for the Dutch economy of 1938. Four sectors (trade, enterprises, government and consumers) and five accounts (a cash flow account, a financial account for shares, a commodity flow account, an income and outlay account and profit account) were distinguished in a simple double-entry bookkeeping system. The figures were rather crude and the detail in the transactions very limited. For example, revenue by the government consist only of 'taxes', 'taxes' are only paid by consumers, government expenditure is limited to 'various income components' and no transactions with the rest of the world are shown.

Van Cleeff's purpose was to demonstrate that it is possible to present a concise and systematic overview of the national economy. Provided sufficient statistics are available, this overview could be meaningfully elaborated in many respects. He mentioned further specification of the various purchases and expenditure, adding a breakdown by industry or region and including a national balance at the begin and end of the year.

van Cleeff's system of national accounts was inspired by the analogy with the business accounts and by his ideas on planning and organizing the national economy. He compared the national government with the directors of a big firm, regarded the national accounts as the business accounts of the nation and stated that the government should draw up a business plan for the nation. The national accounts should therefore play a major role in the socio-economic planning advocated by van Cleeff.

Socio-economic planning was presented as an alternative to an unorganised capitalist economy and a communist economy. The economy should be organized as a firm, but -in contrast to communism- individual norms, values and wishes for personal development should be respected.

After the Second World War, van Cleeff joined Tinbergen at the newly founded Central Planning Bureau (CPB). He started as head of department I "Research on Economics of Planning" (Planhuishoudkundig onderzoek). His views on planning were ideologically the basis for the first years of the CPB. However, Tinbergen's new ideas on planning and the role of the CPB gradually started to dominate. Van Cleeff's normative approach of planning lost the battle with the new mathematical and instrumental approach developed by Tinbergen (see Van den Bogaard, 1998, pp. 55-59).

In Norway, Frisch, another pioneer in econometrics, not only stimulated but also pioneered himself in the development of national accounting systems (see Bjerve, 1996 and Aukrust, 1994). From the middle of the 1930s, Frisch emphasised the need for standardising the macroeconomic concepts, inter alia to facilitate comparisons between theories by different authors. Furthermore, precise definitions and definitorial relationships were required in order to develop macroeconomic models for the explanation of business cycles. He saw the national accounts as an instrument for showing the interdependence between the central and local government budgets and the rest of the economy. This could then be used to influence government policy and to restrain the free market system, as the latter worked so disastrously during the Great Depression.

Frisch defined the national accounts as "a survey not only of the national income in a certain year, or the national wealth at a certain point of time, but a fairly complete overview of the entire national economic operations during a year, arranged in such a manner that the relationships between the various data clearly emerge. The set-up must be done in such a way



that the relationships in which we are particularly interested, appear with the necessity of bookkeeping. For instance, the change of wealth shall with the necessity of bookkeeping agree with the data on income, consumption, and saving" (Frisch, 1940).

Frisch devised a general accounting system in 1942 (the Ecocirc-system), which was more elaborated by Aukrust in 1949 (see Ohlsson, 1953, pp. 51-61). In Aukrust's system, a clear distinction was already made between current and capital transactions and between product flows and financial flows. Also the idea of quadruple-entry bookkeeping, i.e. double-entry bookkeeping which is also consistent for transactions between two sectors, was made explicit (see Aukrust, 1994, p. 41 and 42).

In 1943, Statistics Norway began calculations of the annual Gross National Product from 1935 on, and of the reduction of national wealth during the war. For the period 1940-1943, estimates were also made of exports and imports, the German use of goods and services and the residual public and private consumption. From 1946, estimates in the form of social accounts were published annually and presented as an integral part of the national budget transmitted to Parliament. In 1946 and 1947, Bjerve used national accounts as a pedagogical device in which he checked the internal consistency of forward-looking data in the national budget and the consistency of some historical data (see Aukrust, 1994).

A specific feature of the work by Lindahl and Frisch is that the development of national accounting concepts is regarded as an important step in improving and clarifying economic theory, e.g. of the Stockholm school. "Like Frisch, Lindahl strived to achieve a system of concepts as general as possible. ... the system had to be applicable both to ex ante and ex post values, and equally suitable for the description of micro-economic and macro-economic phenomena... the description at the micro level should be equally applicable to firms, households, or any subject" (Aukrust, 1994, p. 23).

At present, the link between econometric models and national accounting is still strong: the accounting logic is explicitly used in modelling national economies and national accounting figures are used as data input for estimating coefficients; the latter implies also that the concepts underlying these figures are used (see Klein, 1983).

### *The Keynesian revolution*

Keynes published his 'General Theory' in 1936. This launched the Keynesian revolution and gave birth to macroeconomics. This revolution in economic theory had an enormous impact on national accounting. The Keynesian type of analysis established a direct link between economic theory and national accounting as both came to use the same macro-economic identities. A direct effect on national accounting was that another definition of national income and product became most popular. In order to establish a closer linkage between national income and various categories of expenditure, net national income at factor costs was more and more replaced by gross national income at market prices<sup>25</sup>.

The Keynesian type of analysis also threw a new light on the role of the government: a new responsibility for stabilising the economy was added. Accounting for this role of the government became necessary for economic policy analysis. This induced the introduction of accounting per sector, in particular the introduction of a sector government. As a consequence of the Keynesian revolution, the importance of national accounting figures for economic theory and economic policy increased and was more widely recognised. At present, the link is much clearer. It is therefore not surprising that even introductory textbooks in economics, like that of Samuelson and Nordhaus (1985), include a chapter on national accounts.

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<sup>25</sup> The increased popularity of gross concepts was also due to the specific war circumstances: inasmuch the replacement of capital could be postponed till after the war, it was important to present national income figures gross of the related capital consumption (see Studenski, 1958, p. 153 and Bos, 1992b).

Keynes personally also stimulated the development of national accounting systems, in particular in the United Kingdom. He clearly saw the importance of national accounting for planning a national economy in times of war as well of peace. On his instigation, Stone and Meade prepared in 1941 estimates on national income and expenditure (Meade and Stone, 1941). These estimates were used to present government expenditure and revenue as part of a system of balanced tables describing the whole national economy. In this way, they became a tool in planning the British war economy (Stone, 1951, p. 84; Patinkin, 1976, p. 1109). A quote from Stone on his work during the war may illustrate this use:

"The main use of the work on national income and expenditure was to throw light on the magnitude of the problems of war finance, and for this purpose it was used both in discussions before the Budget and in the Chancellor's Financial Statement ... if substantial price increases in the free sector of goods and services and endless queues and confusion in the controlled sector were to be avoided, something had to be done to reduce the pressure of demand either by increasing taxation or by stimulating saving ... fiscal policy came to be directed not merely to the internal problems of financing government expenditure, but to the broader question of maintaining price and income stability throughout the economy" (Stone, 1951, pp. 86, 87).

#### *The abolishment of the gold standard*

In the thirties, countries left the gold standard. As a consequence, monetary policy needed a new anchor and was linked to national income. In order to avoid excessive inflation, the supply of money should grow in line with the nominal growth of domestic product corrected for changes in the velocity of circulation. During and directly after the second world war, several countries (e.g. USA, UK, France and the Netherlands) used the national accounts to estimate the inflation gap and investigate the size and effectiveness of various policy measures to be taken to avoid massive inflation, e.g. restrictions on the use of bank deposits or a big incidental capital tax. These studies include also Keynes' famous report *How to pay for the war?* (Keynes, 1940)<sup>26</sup>.

#### *The balance of payments and the national accounts*

In 1950, Meade wrote his book "The balance of payments" (see Meade, 1951). In the first three chapters, the basic concepts of the balance of payments are clarified and linked to those in the national accounts. The importance of the various types of consistency are stressed. For example the consistency between net exports and a country's indebtedness to foreigners, between the balance of payments of various countries or between the balance of payments and the national accounts, e.g. private and public expenditure and saving, monetary circulation and inflation. In the remainder of the book, he used these accounting identities to analyse the consequences of various types of monetary and fiscal policy on the balance of payments. His exposition of the balance of payments and the national accounts is still the basis of modern text book expositions on international economics (see e.g. Krugman and Obstfeld, 1994, chapter 13).

#### *Innovations in national accounting concepts and compilation methods*

These decades were not only a revolution in terms of many new uses of national accounts. They were also a revolution in terms of the development of national accounting concepts and compilation methods. Both revolutions were not independent: they reinforced each other and often also the same persons were involved.

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<sup>26</sup> This report also stimulated the work by Meade and Stone (1941), see above.

The works by Clark and Kuznets consisted of profound and detailed estimates that were accompanied by elaborate motivations of the concepts and statistical methods used. In the first chapter of "National Income and Outlay" (Clark, 1937), Clark expounds the purposes of national income measurement and its basic concepts. Examples of the latter are his discussion of the inclusion of the services of owner-occupied dwellings, the exclusion of the services of consumer durables, the exclusion of holding gains and losses and a possible 'deduction for any demonstrable exhaustion of natural resources' (Clark, 1937, p. 9). In "The National Income, 1924-1931" (Clark, 1932), he strongly complains about the condition of the British official statistics. He criticised for example the use of different classifications in various national statistics on employment (Clark, 1932, p. vii).

Much more than Clark, Kuznets was also a pathbreaking theoretician on accounting concepts and statistical techniques. Famous is his discussion in *Economica* with Hicks on subjects like the relation between changes in national income and welfare, the valuation of government output and the concept of intermediate and final product (Hicks, 1940 and 1948, Kuznets, 1948b). There are two other well known discussions in which Kuznets played the central role: the discussion in 1944 on his "National Product, War and Prewar" (Kuznets, 1944; Gilbert, 1944) and the discussion in 1948 on the New Department of Commerce Income Series (Kuznets, 1948a) with Gilbert, Jaszi, Denison and Schwartz (1948). Like Clark, international and inter-temporal comparison were a central focus of his work. As concerns statistical techniques, his contribution to the development of the commodity flow approach is most notifying<sup>27</sup> (Kuznets, 1938). Other examples in this respect are his discussion of data-processing techniques like interpolation and extrapolation and of the reliability of estimates (see e.g. Kuznets, 1941)<sup>28</sup>.

Clark and Kuznets did not play a role in developing national accounting systems, i.e. a system in which sectors as well as accounts are used in presenting data. Kuznets saw it even as a "dubious addition to the theoretical equipment" (Kuznets, 1948a, p. 154)! The development of national accounting systems occurred simultaneously in Britain, the Netherlands and the Scandinavian countries.

A common feature of the pioneering work in Scandinavia (e.g. Frisch and Aukrust), the Netherlands (van Cleeff) and the United Kingdom (Meade and Stone, Hicks) was that they were explicit about the idea to use double-entry bookkeeping for describing the national economy. Fisher had similar ideas some decades earlier in his "The Nature of Capital and Income" (1919) (see Kenessey, 1994). In the United States, Fisher's ideas were further expounded by Copeland and Morris in the 1930s. However, the influence of this work on the introduction of double-entry bookkeeping in the international guidelines is at most indirect, i.e. by influencing the ideas of Frisch and Stone. Furthermore, it is a bit awkward to note that even Fisher's influence on official US-estimates seems to have been minor: "in the United States ... the introduction of double-entry national accounting in 1947 has little to do directly with Fisher, Copeland or Martin but a great deal with the UK experience regarding this matter" (Kenessey, 1994, p. 116).

In 1939, the League of Nations had requested for a report with guidelines in order to improve international comparability of national accounting figures, but the war delayed the progress on the report. In September 1944, representatives of the UK, the USA and Canada met in order "to exchange views ... and, if possible, to bring about uniformity in terminology and the treatment of controversial items" (Denison, 1947, p. 3). As a result of this meeting, the national accounts of the United States and Canada were revised, which made them more compatible with the Stone/Meade proposals of 1941 and the British national accounts (see

<sup>27</sup> However, Lindahl already applied the commodity flow approach some years before Kuznets, see below.

<sup>28</sup> For a general overview of the work by Kuznets, we refer to Lundberg (1984). A discussion of his contribution to the development of economic statistics can be found in Studenski (1958) and Carson (1975).

Carson, 1975, p. 177). Immediately after the war, in December 1945, consultations on the United Nations report were resumed. This time also representatives from countries occupied during the war by Germany, like the Netherlands and Norway, could be present. The report was published in 1947 by the UN (UN, 1947) and consisted mainly of an appendix by Stone (1947).

This appendix can be regarded as the first fully worked out and detailed national accounting system (see Aukrust, 1986 and Carson, 1975, p. 178). Furthermore, the report was also path breaking in that it contained for the first time international recommendations on national accounting. However, the report should not be regarded as the first official guidelines of the United Nations: it was not approved by the statistical commission of the United Nations as official guideline, but referred to as a useful technical report; it was also not used as a guideline for submitting data to the United Nations.

## 2.4 Summary

In the last quarter of the seventeenth century, national accounting had a brilliant start in the work by Petty and King. Nearly one century later, Quesnay's zigzag diagram was the first precursor of modern input-output tables and sector accounts. Progress in national accounting was often slow and small and there were major cases of regress, like the production boundary used. Despite such unfortunate intellectual detours, at the beginning of the twentieth century, the common stock of knowledge on national accounting had already become considerable. It included for example a comprehensive production boundary treating e.g. agriculture and government services as productive, the notion of three basic ways to estimate domestic product and the concepts of value added and constant prices.

All early estimates of national income were practical and directed at concrete policy issues; this was a common feature of national income studies up to the 1920's. They were therefore not only the start of measuring national economies, but implied also the start of quantitative economic policy analysis. The policy issues addressed were national economic power and performance, poverty, unfair and inefficient taxation and sustainability of public finance. Often, several of these issues were discussed and the national accounts approach was essential for demonstrating that the various issues were intimately linked.

Directly after the first world war, Keynes wrote "The economic consequences of the peace" (Keynes, 1920). This polemic made him instantly world-famous. It is still a major example of the use of national accounts statistics for (economic) policy analysis.

The number of estimates gradually increased all over the world, in particular after the first world war. Substantial progress in national accounting as an applied science was mostly absent until the 1930s and 1940s.

The period 1930-1950 was a revolution in terms of the roles and uses of the national accounts, e.g. the discovery of input-output analysis, purchasing power parities and macro-econometric modelling and the Keynesian revolution in economic thinking. Most of these new uses also reinforced each other. These uses were also closely linked to the economic circumstances: the economic crisis of the thirties, the second world war and the need for recovery afterwards stimulated an active role of the government. National accounts statistics turned out to be very useful in such circumstances for analyzing, monitoring, forecasting, discussing and planning the national economy. These decades were also a revolution in terms of the development of national accounting concepts and compilation methods. For example, the first fully worked out and detailed national accounting system was published in 1947 (the famous annex of Stone in a UN-report).

### 3. CONCEPTUAL DEVELOPMENTS SINCE THE SECOND WORLD WAR

#### *Expanding and standardising the conceptual framework*

#### 3.1 Introduction

In 1947, for the first time a report on national accounting concepts was published by the UN (the 1947 UN-report). Some years later (in 1951), the first official guidelines were published. Since then, national accounting theory and practice have increasingly been dominated by these guidelines. The period since the Second World War can thus best be labelled as 'the era of the international guidelines'. About fifteen years ago, the third 'generation' of guidelines has been issued (the SNA93 and ESA95). At present, a revised set of guidelines (SNA08 and ES99) is being prepared. In section 3.2, the first UN-report and the four generations of official guidelines are introduced briefly. The constancy and change in these guidelines is discussed in section 3.3.

Many innovations in national accounting have been made since the Second World War. After gaining wider acceptance and maturity, a great deal of them have been included in the guidelines and some others have not. These post-war innovations are investigated in section 3.4. They also provide some backgrounds to the concepts in the international guidelines. A summary of the conceptual developments since the Second World War is provided in section 3.5.

In view of the current literature on national accounting, the value added of this chapter is twofold:

- It contains a rather unique comparison between the successive guidelines, including those currently being prepared;
- It provides a concise overview of the major conceptual developments since the Second World War. A somewhat similar, but much more extended, overview can only be found in Vanoli (2005).

#### 3.2 Four generations of international guidelines

##### *The first guidelines*

The era of the international guidelines started in 1947 with the publication of the UN-report, which mainly consisted of Stone's appendix. Although it was a report on behalf of the UN, the system recommended was "based essentially on the model of an advanced industrial economy in which transactions in money are dominant" (UN, 1947, p. 24).

On request of the OEEC (the precursor of the OECD), official guidelines were written under the direction of Stone. These were the first official guidelines. The guidelines were to be used in planning the Marshall-aid. In 1951, a "Simplified System of National Accounts" was published (OEEC, 1951). In comparison with the 1947 report, this was truly a simplified system: only a current and capital account were distinguished and the number of sectors was limited to three (government, enterprises and households), without any subsectoring.

Such a 'simplified system' was deemed necessary, as the proposed system in the 1947 report was far too ambitious for most OEEC-countries. In the beginning it was probably even unattainable for the countries most advanced in national accounting. The 1951 foreword contains a clear motivation of its choice of a very simple system: "any system of the kind described here must take account of the kind of information available in different countries. The standard taken is one which in a broad way should be well within the competence of those countries which are advanced in national accounting work but beyond what can be expected in those countries where this work is less advanced" (OEEC, 1951, p. 5).

In 1952, the 'Simplified System of National Accounts' was replaced by the "Standardised System of National Accounts" (OEEC, 1952). This new OEEC-guideline took account of the experience in implementing the simplified system. It contained more accounts, but in comparison to the 1947 report it was still very simplified.

Under the chairmanship of Stone, the UN issued a new guideline in 1953: "A System of National Accounts and Supporting Tables" (UN, 1953); this report is frequently referred to as the first 'SNA' (SNA53). The guideline looked rather similar to the OEEC Standardised System of National Accounts. In contrast to the 1947 report and the OEEC guidelines, the UN report was also intended to be of use for developing countries. This difference in orientation was only reflected in a somewhat extended production boundary, i.e. including also some types of non-market output. In 1956, a slightly revised version of the 1953 report was published.

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**Table 3.2 The successive guidelines on national accounting**

1947	Technical report by the UN containing recommendations; including the famous annex by Stone: the first detailed and fully worked out national accounting system
1951-1953	First generation of international guidelines: OEEC guidelines of 1951 and 1952; UN guideline of 1953 (SNA53); very simple tables and accounts
1968-1970	Second generation of international guidelines: UN guideline of 1968 (SNA68), the European guideline of 1970 (ESA70) and the Material Product System of 1969 (MPS69) for communist countries
1993-1995	Third generation of international guidelines: joint guideline of 1993 by the international organizations (SNA93 by UN, IMF, World Bank, OECD and EC) and the European guideline of 1995 (ESA95)
2008-2010	Fourth generation of international guidelines: updates of the joint and European guidelines (SNA08 and ESA09)

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*The second generation: SNA68 and ESA70*

In 1968, the UN published an entirely revised and much more detailed "System of National Accounts" (SNA68; UN, 1968). Aidenoff and Stone served as the main authors. The 1968 report takes a flexible view with respect to the attainability of its system: a very extended system is presented and countries can to a substantial extent determine their own priorities. For developing countries, a separate chapter is included with suggestions for priorities and some classifications especially useful for developing countries, e.g. the distinction between urban and rural areas or between modern and traditional modes of production.

In the late seventies, the UN published a number of supplementary guidelines. They clarified some issues not (well) covered in the SNA68, like balance sheets and reconciliation accounts, income distribution, constant prices and tangible assets.

In 1970, for the first time guidelines on national accounting of the European Communities were published (ESA70; Eurostat, 1970). The concepts in these guidelines were broadly the same as in the SNA68, but focused more on European circumstances, were a bit more precise, included also a concept of employment and may have reflected to some extent French national accounting practice<sup>29</sup>.

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<sup>29</sup> This French influence can be discerned e.g. in the preference given to homogeneous branches over industries.

*The second generation: MPS69*

In 1969, also a fundamentally different guideline on national accounting was published, the Material Product System. This guideline has a rather different background and history than the other guidelines.

After the Russian revolution, official national accounting figures of the Soviet Union came to be based on a 'Marxian' concept of production<sup>30</sup> (Studenski, 1958, pp. 350-353; see also section 2.2.). Since the fifties, also several other centrally planned countries adopted this concept for their national accounts. In 1969, the Comecon-countries adopted the "System of Material Product Balances" (generally referred to as 'Material Product System', MPS69) as the basis for compiling their national accounting figures (Standing Statistical Commission, CMEA, 1969; see also UN, 1986). In 1971, the United Nations accepted that the centrally planned countries use the MPS69 for their national accounts. This implied among others that the UN-questionnaires sent to these countries -and thus the figures published by the UN about these countries- employed the concepts and classifications of the MPS69 rather than those of the 1968 SNA.

*The third generation: SNA93 and ESA95*

A third generation has been issued about 15 years ago: the revised SNA was approved in 1993 (SNA93) and the revised ESA was approved in 1995 (ESA95). The major authors of the SNA93 are André Vanoli (in particular the new accounting framework) and Peter Hill (in particular prices and volumes and the overall drafting). These new guidelines present a very elaborate accounting framework and stress the importance of flexibility to take account of different data needs and different national circumstances.

For various reasons, the SNA93 can be regarded as the first really universal standard on national accounting concepts. Firstly, the SNA93 has been drafted under the joint responsibility of various international organisations, i.e. the UN, the Worldbank, the IMF, the OECD and the EU. They took also the responsibility to better harmonise the concepts in some related guidelines, like the IMF's Balance of Payments Manual, the IMF's Government Finance Statistics Manual and the ESA95 of the EU. However, the SNA53 and SNA68 have been drafted under the auspices of only the United Nations (UN). Secondly, the MPS69 has not been revised as the sudden collapse of communism made it an anachronism of the Cold War. All Eastern-European countries in transition have immediately started to implement the SNA93 and ESA95. Thirdly, compliance of national practice to the international standards is more strictly adhered to (see chapter 4).

A novelty of the ESA95 is that it is part of an official regulation of the EU and thus a legal document. This contrasts with all the other guidelines, like the ESA70 and SNA93: these are 'gentleman's-agreements; from a legal point of view their application is only binding in some situations.

The explicit legal character of the ESA95 is deemed necessary considering the many and important administrative uses made of national accounts figures in the EU, e.g. as entrance criteria for the European Monetary Union and for determining a major part of the own resources of the EU (see chapter 4). This administrative use necessitates that the ESA95 should be more accurate and precise than the SNA93 and that the Member States should follow it more strictly.

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<sup>30</sup> However, unofficial estimates based on SNA53-type of concepts were also made by individual researchers. Seton (1954) reconstructs the Soviet accounts for 1934, the last year for which national statistics had been compiled in a systematic form. This type of research is quite difficult, as had been published was very incomplete, often inaccurate and almost all in percentages. Because prices did not necessarily reflect scarcities it was difficult to obtain an overall picture.

*The fourth generation: SNA08 and ESA09*

At present, the major part of a new update of the SNA has already been finalized<sup>31</sup>, while work is still to be done on some chapters. The updating process of the European guidelines has just started and the final draft is intended to be completed in 2009; it will take then some years to make a legal act of this final draft.

These updates of the SNA93 and ESA95 do not involve major changes in basic concepts and scope. They are best regarded as further clarifying the framework developed fifteen years ago.

In section 3.3, the scope and basic concepts of the four generations of guidelines will be compared<sup>32</sup>. However, before starting this comparison, it is necessary to pay some attention to the role that the international guidelines have played in national accounting.

*The role of the guidelines*

International guidelines have been influential for several reasons. Firstly, the leading international experts of the profession have developed the systems in the international guidelines. They are therefore relatively well thought out and it is costly, time consuming and not easy to invent an alternative system.

Secondly, by keeping in line with the international guidelines, national figures can be compared with figures from other countries. This is important, as international comparison is a major use of national accounting figures.

Thirdly, in many countries, the national accounts have been set up by or improved with help from the international organisations issuing the guidelines (UN, OECD, EU) or with help from countries advanced in national accounting (Sweden, France). In the latter case, following the international guidelines is usually stimulated to the extent that the helping countries follow them.

As a final reason, we mention that all countries are obliged to compile some figures on the basis of the international concepts, as the contribution to the UN depends on the level of National Income. Besides, the questionnaires of the international organisations employ these concepts. In the EU, due to some important administrative uses, the guidelines are even legally binding; the same applies to the extended statistical programme linked to these guidelines.

The international guidelines are very successful in standardising the concepts and classifications used in compiling national accounts figures. The guidelines achieved that all over the world official figures came to be based on uniform notions of the production boundary, asset boundary, the distinction between intermediate and final consumption, etc. From 1947, countries have adapted their concepts in order to be (more) in line with the international guidelines (see section 4.2).

Next to the official guidelines on the national accounts, over the years many other reports, handbooks and guidelines have been published on specific parts of the national accounts. Recently, more specific guidelines have been issued on e.g. price and volume measurement (Eurostat, 2001), quarterly national accounts (Eurostat, 1999) and input-output tables (Eurostat, 2008). A very welcome novelty is that also the users' perspective (how to use the national accounts for analysis?) starts to be addressed, e.g. by the guidelines on productivity analysis (OECD, 2001), by the EU-KLEMS-project for detailed and internationally

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<sup>31</sup> Anne Harrison is the editor.

<sup>32</sup> For a more detailed comparison of the first three generations, see Bos, 1992a and Bos, 1994.



comparable productivity data and analysis by industry and by the report on national accounts and policy analysis (UN, 2002).

### 3.3 Comparison of the successive international guidelines

The successive international guidelines have many differences in purpose, concepts, scope and amount of detail. In this section, they will be compared. The background and concepts of the MPS69 are fundamentally different than those in all the other guidelines. This section starts therefore with a comparison of all the other guidelines. At the end of this section, they will then be compared with the MPS69.

#### *Purposes*

A simple chronological sequence can be found in the successive generations of official guidelines: in time they grow bigger and merely add subjects and detail. This culminates in the SNA08 and ESA09, which are the most encompassing and detailed. The 1947 UN-report does not fit in this picture: it is much more ambitious, detailed and complex than the first official guidelines.

In the 1947 UN report, relatively much attention is paid to the purposes and advantages of national accounting. In general it is stated that: "It is necessary to know in quantitative terms how the national income is related to its constituent transactions and to other totals of transactions. Thus modern enquiries which had their origin in an attempt to measure certain broad totals have changed their emphasis and now concentrate more on the structure of the constituent transactions and on the mutual interdependence of these transactions. It has come to be realised that for different purposes certain related but distinct aggregates are useful" (p. 24). Thus, the computation of national aggregates is just one of the main concerns of the 1947 UN report.

In contrast, the compilation of broad totals seems to be the only objective in the SNA53 and OEEC-guidelines. This is evidenced by the sector accounts: these should be recorded in a very specific way in order to obtain national aggregates directly. The SNA68, the ESA70 and the most recent set of guidelines adopt an approach similar to the 1947 UN report. For example, the SNA68 states that "For many purposes of both analysis and policy, however, it is not sufficient to work with aggregates alone; it is also necessary to look at many aspects of the economy in greater detail. As a result, economic models are now built in which the main aggregates are subdivided, or disaggregated" (para 1.10).

In the SNA93 and ESA95 and their newly drafted updates (SNA08 and ESA09) also the multi-purpose character of the guidelines is stressed, e.g.: "The System is primarily intended to provide disaggregated data to meet the needs of analysts and policy makers interested in the behaviour of markets and factors responsible for major disequilibria such as inflation and unemployment. The design of the System and its coverage of economic activities has to be a compromise intended to yield the maximum benefits to users of all kinds and may not therefore be ideally suited for any purpose taken in isolation" (SNA93, Chapter I, p. 22).

The limitations of GDP and national income as measures of welfare are discussed only in the SNA93 and ESA95 and their newly drafted updates. For example, "[a]ggregate indicators such as GDP do not reflect any changes in distribution [of wealth and income] that may be taking place over time, so that such indicators need to be supplemented by micro-data for purposes of analysing changes in welfare (SNA93, Chapter I, p. 21). Similarly, "a natural disaster may well lead to an increase in GDP by creating extra demands, even though the community may be no better off than in the previous period if the loss of welfare caused by

the disaster exceeds the increase in welfare from the extra production and consumption" (SNA93, Chapter I, p. 20).

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**Table 3.3 Major changes in the scope of the successive universal guidelines**

SNA53	Simple set of tables and accounts in current prices
SNA68	Extended accounting system, including input-output tables, general principles on prices and volumes and financial accounts
SNA93	Inclusion of balance sheets, employment and purchasing power parities More detailed accounting structure (more accounts, more sub-sectors and detailed supply and use tables) Separate chapters on satellite accounts and flexible adjustments for national circumstances Detailed discussion of general principles on prices and volumes (e.g. chaining and index formulae)
SNA08	More detailed discussions of many topics, e.g. government accounts, the informal sector and capital services (important for productivity measurement) But no detailed discussion of price and volumes by industry/product and no separate chapters on quarterly national accounts and regional accounts (unlike ESA95 and its forthcoming update)

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### *Explanation of the concepts*

In the 1947 UN report, the SNA93 and SNA08, concepts are quite extensively discussed. Both guidelines can be regarded as introductions into the logic and basic principles of national accounting.

The ESA95, the ESA09 and the guidelines of the second and third generation like the SNA53, the SNA68 and ESA70 are better characterised as a systematic enumeration of recommended booking conventions. In these guidelines, the considerations underlying the choice of concepts are in general discussed much more sparingly. However, in the SNA68, some topics are well discussed, i.e. the structure of the accounting system, prices and volumes and the input-output tables (all drafted by Stone). Furthermore, in the ESA95, eight characteristics of the basic concepts and the structure of the accounting system are discussed in the introductory chapter. In the ESA09, this introductory chapter will be more elaborate.

A major motivation for revising the SNA68 was that "its manner of exposition makes it inaccessible to many users especially those new to the System of National Accounts" (Harrison, 1990, p. 336). So, in the SNA93, "key concepts are defined by rationale and not by enumeration" (Harrison, 1990, p. 336). From this point of view, the ESA95/ESA09 can be regarded as supplementing the SNA93/SNA08, i.e. providing a systematic enumeration of what is included in and excluded from the concepts.

### *Observation and imputation*

The accounting systems recommended in all the guidelines, contain flows for which the values can readily be observed as well as flows for which values have to be imputed. This applies for example to income in kind and the services of owner-occupied dwellings. The fundamental problems with such imputations are already noted in the 1947 UN report:

"The items in the tables may be divided, from one point of view, into cash terms and imputed items, the former being those elements which reflect market transactions, and the latter being those for which a calculation has to be made in the absence of market transactions. In view of the difficulty of finding a commonly accepted basis for the second type of estimate it is desirable that, as far as possible, items of this kind, should be shown separately" (p. 18).

In the SNA93 and ESA95, the distinction between imputed items and other items is explicitly incorporated in its supplementary classifications.

The distinction between what can be observed and measured and what can only be inferred on the basis of some theory or convention, was also the reason for the distinction in the SNA68, SNA93 and ESA95 between, on the one hand, supply and use tables and, on the other hand, symmetric input-output tables. The SNA68 states:

"it is possible to carry the processing (of data) to a point where the results are no longer data. For example, the supply of a commodity may be allocated to users on the assumption that each user draws his supply from domestic production and imports in a common proportion. The result may be something quite different from what is obtained by observing the proportions in which different users actually make use of domestic production, and it may be seriously misleading. While ... assumptions are almost always needed in processing data, it should be recognised that when they come to play a major role the result is no longer an observation but an inference. At the same time the main purpose of making observations is to enable us to make inferences; all that is important is that we should not confuse the two" (SNA68, paragraphs 1.96 and 1.97).

### *Flexibility*

According to the 1947 report, guidelines on national accounting should be a flexible instrument. Flexibility is required because national accounting conventions can not take account of all institutional differences in the world and all specific uses of national accounts figures. For example, it is clearly expressed that "in applying this national accounting system it will frequently be necessary to extend and adapt it to the particular circumstances of different countries" (p. 18, paragraph 11). Furthermore, "experience shows that unavoidable differences of opinion arise in the treatment of certain transactions due in large measure to institutional differences in different countries" (p. 18, paragraph 10). As a final case in point:

"where income and expenditure components are used to work out behaviouristic or institutional coefficients such as the propensity to consume, the relation of imports to national income, etc. it may be argued that .... those definitions should be chosen which give rise to the simplest enduring regularities. Thus such questions as whether corporate taxes should or should not be included in national income may, if they cannot be settled on theoretical grounds, be decided by econometric analysis" (p. 24).

In the guidelines of the first and second generation, such remarks on the interaction between national accounting concepts on the one hand, and particular circumstances and uses on the other are absent.

The SNA93/SNA08 and the ESA95/99 return to the philosophy of the 1947 UN report: "A prominent new feature of the revised SNA is that it emphasised flexibility. The revised SNA includes a description of how the central framework can be applied to policy and analytical requirements, data availability and other specific circumstances of different countries. Also, it describes how satellite accounts with alternative product and income concepts can be elaborated as an extension of the central framework" (Annex on changes, SNA93).

### *Accounting structure and sector classification*

Drastic changes occurred in the accounting structures and sector classifications. The 1947 report shows a detailed and fully worked out accounting system. The first generation of official guidelines, like the SNA53, advocate a much simpler accounting system with only a very limited number of accounts and sectors. The SNA68 and the ESA70 of the third

generation employ a number of accounts and sectors rather similar to the 1947 report. In the SNA93/98 and the ESA95/99, the amount of detail offered is drastically increased. For example, in the SNA68 only one account is used for describing the distribution and use of income, while in the SNA93 six accounts are used.

In the 1947 report and the first official guidelines, the sector classifications are fully functional, e.g. the sector households contains only consumers and does not include households in their function as producers like the activities of self-employed. In the SNA68 and ESA70, the sectors are functional for the production account and the generation of income account but institutional for the other accounts. In the SNA93 and ESA95, the sectors are fully institutional.

A novel feature of the SNA68 was that the national accounting system was explained on the basis of a matrix. This matrix presents an overview of the accounts and their main classifications. It integrates the supply and use tables with the sector accounts. However, it should be noted that the matrix was more complete than the accounting system actually described by the SNA68: in the matrix, balance sheets and a revaluation account are shown, but they are not at all discussed in the remainder of the SNA68. In the SNA93/98 and ESA95/99, the matrix is one of the alternative types of presenting national accounts. The other types are balancing statements (T-accounts), diagrammatic presentation and equations.

### *Scope*

Major changes also occurred in the scope of the guidelines. In the SNA68 and ESA70, for the first time recommendations concerning constant prices and input-output tables are presented. In the ESA70, only a symmetric input-output table product by product (homogeneous branch) is presented. In the SNA68, two types of input-output tables are distinguished: supply and use tables on the one hand and symmetric input-output tables on the other hand. It is shown how supply and use tables can be transformed into symmetric input-output tables, both of the industry by industry type and of the product by product type. In the ESA70, the SNA93 and ESA95 also the concept of employment is included. The SNA93 and the ESA95 introduce for the first time balance sheets, other changes in assets accounts, actual final consumption and actual disposable income, purchasing power parities; the SNA93 includes in addition Social Accounting Matrices and satellite accounts. Both the SNA93/98 and ESA95/99 greatly extend their discussion of the input-output framework.

In the SNA08, six new chapters have been added for discussing the perspective of various sectors: Measuring corporate activity (perspective of non-financial corporations), General government and public sectors, Non-profit institutions, Households sector, Rest of the world accounts and Links to monetary and financial statistics (= perspective of financial corporations). Furthermore, new chapters have been introduced for capital services and the national accounts (about measuring the volume of capital services for a better measurement of productivity) and the informal economy.

In ESA09, also new chapters will be introduced for the perspective of some specific sectors: Insurance and pensions, Rest of the World accounts, Government accounts and Links between business accounts and national accounts (= perspective of non-financial corporations). Furthermore, a new chapter discusses European accounts, i.e. how to add up and consolidate the national accounts of the EU-member states to arrive at true European accounts.

In the SNA93, quarterly accounts and regional accounts are only referred to in the chapter on Special adjustments for national circumstances. In the ESA95, they are given a much more prominent place, as they constitute two of the thirteen chapters. This is more in line with the importance attached by data users to quarterly accounts and regional accounts. However, it should be added that the ESA95 chapter on quarterly accounts is not a serious

chapter in terms of size, as it amounts only to two pages. The ESA95 chapter on regional accounts is also brief (ten pages), but captures nevertheless in a serious way some of the essential problems of regional accounting.

In the SNA08, quarterly accounts and regional accounts are only briefly mentioned as part of the chapter on satellite accounts. This contrasts clearly with the ESA09: this includes separate and substantially expanded chapters on the quarterly accounts and regional accounts.

In the satellite accounts chapter in the SNA93 and SNA08, only few specific satellite accounts are discussed. In the SNA93 only environmental accounts are discussed. In the draft SNA 98, also the tourism satellite account, health satellite account and unpaid household account are covered. The (draft) ESA09 provides a somewhat broader overview of satellite accounts.

The merits of Fisher indices and the chaining of indices are already acknowledged by the SNA68. However, only in the SNA93/98 and ESA95/99, they are actually recommended as the best strategy for deflating. The ESA70 proposes to use Laspeyres indices for volumes and Paasche for prices. The SNA68 recommends a mixture of both Laspeyres and Paasche as this will better fit the existing data. Both the ESA70 and ESA95 recommend to rebase every five years. The SNA93 is not explicit about this.

#### *Changes in basic concepts*

A change in concept, in particular important for developing countries, was the inclusion of primary production for own-account. This is included in all official guidelines. Other important changes are:

- Only in the 1947 report, government output is valued at costs including some interest paid on government debt;
- Only in the 1947 report, realised holding gains are included in national income;
- Only in the guidelines of the fifties, gross rent is imputed for buildings owned and occupied by the government;
- Only in the SNA68 and ESA70, Financial Intermediation Services Indirectly Measured (FISIM, i.e. all banking services not explicitly charged to clients) is not allocated to sectors and thus not split in intermediate and final consumption (and exports).
- Only in the 1947 report and the SNA93/08 and ESA95/09, some intangible durables are included in capital formation. In the 1947 report this may also include the cost of a massive advertisement campaign.
- Output is valued at basic prices since SNA68 (i.e. also in ESA70, SNA93/08 and ESA95/09).
- All guidelines recommend a different set of central aggregates of income and product.
- Many new financial instruments, like deep discounted bonds, have been taken account of in the SNA93 and ESA95;
- the SNA93/08 and ESA95/09 have substantially improved the links with other statistics and their guidelines, like the Government Finance Statistics Manual and the Balance of Payments Manual.

It is the irony of history that it now and then repeats itself, i.e. not only progress but also some clear steps backwards. In the preliminary drafts of the SNA93, some of the concepts in the SNA68 were abandoned and replaced by concepts from the earlier reports. Cases in point are the allocation of FISIM and the imputation of rent on government buildings. However, in the final draft, the allocation of FISIM is left open to the compilers and no rent is imputed for government buildings. In the ESA95, one issue was left undecided: whether or not compilers should allocate FISIM (and if so, according to which method); this was later resolved by a separate regulation prescribing how FISIM should be allocated. In SNA08 and ESA09, FISIM is to be allocated to the various uses.

Notwithstanding some important changes in concepts, the most characteristic feature of the guidelines is their constancy in basic concepts. This is evidenced by the production boundaries. The production boundaries of all guidelines exclude unpaid household services and do-it-yourself-activities and they all include imputed services of owner-occupied dwellings. Even specific national accounting conventions like the imputed charge for banking services, the valuation of government output at costs and recording government production as final consumption<sup>33</sup> are all advocated since 1947. Considering that the guidelines have just been revised, they will most probably constitute an established set of core conventions for more than 75 years.

#### *Changes in concepts in SNA08 and ESA09*

The changes in basic concepts in SNA09 and ESA09 are limited. The three major changes are:

- Expenditure on Research and Development should not be recorded as intermediate consumption but as fixed capital formation and subsequently written-down as consumption of fixed capital;
- Expenditure on military weaponry should not be recorded as intermediate consumption, but as fixed capital formation and subsequently written down as consumption of fixed capital.
- Unlike the output of other financial corporations, the output of the central bank should be treated as non-market and valued at the sum of costs<sup>34</sup>.

In addition, the recording of many specific items/issues has been clarified, e.g. the treatment of employee stock options (= income in kind), non-life insurance in case of catastrophes like 11 September, index linked debt and the concomitant interest payments, public-private partnerships, water as an asset and payments from public corporations to government (and vice versa).

#### *Links with major specific statistics*

For decades, the international guidelines on national accounts statistics were partly inconsistent with the international guidelines on three specific types of macro-economic statistics: balance of payments, government finance statistics and statistics on employment and population. However, most of these inconsistencies have now been resolved.

Also the links with international statistics on specific policy areas (e.g. health care, social security, environment) have been improved. International guidelines on these specific statistics explicitly refer to the national accounts concepts and classifications, discuss similarities and differences and propose satellite accounts to bridge the gap between the national accounts and these specific policy areas.

#### *Comparison with the MPS69*

The major conceptual difference between the MPS69 and the other guidelines pertains to the production boundary, which is confined to 'material production' in the MPS69. For example, the services of owner-occupied dwellings and collective services like government health care, education and defence are not regarded as production in the MPS69. Nevertheless, some important services were included, e.g. all transport and communications (even if they relate to persons).

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<sup>33</sup> This excludes of course the part of government output explicitly sold or used for own-account capital formation.

<sup>34</sup> This only applies when market output is not separated from non-market output; otherwise, the market output, e.g. some financial intermediation services, should be recorded and valued separately as market output.

The choice of a different production boundary is reflected in the sector classification of the MPS69. The sectors distinguished are: Branches of the material sphere, Branches of the non-material sphere serving individuals, Branches of the non-material sphere serving society as a whole and Households.

The production boundary of the MPS69 does not compare favourably to the other guidelines. Furthermore, financial and income flows were shown with hardly any detail, which reflected their minor role in central planning in communist and socialist countries. Quantities of products were the focus of the plans and statistics and not prices, profitability, saving and net lending.

However, in some important respects, the MPS69 was well advanced and even anticipated some of the major extensions introduced by the SNA93 and ESA95. For example, the MPS69 already included the concept of actual consumption (labelled 'Total consumption of the population'), balance sheets on national wealth and capital assets, balance sheets on the employment by activity and sectors, and indicators of real income by main socio-economic groups. Detailed discussions of the MPS69 can be found in Ivanov (1987) and Arvay (1994).

### **3.4 Modern innovations in national accounting**

This section will discuss briefly the innovations with respect to the following topics:

- Financial Accounts and Balance sheets;
- Prices and volumes;
- Input-output framework;
- Welfare, alternative indicators and extended accounts;
- Design of the accounting system, SAMs and satellites.

#### *Financial accounts and balance sheets*

A full set of financial accounts was introduced for the first time in the guidelines of the third generation, i.e. the SNA68 and ESA70. The description of financial flows was influenced in particular by the work of Copeland (1952) and that at the Norwegian Bureau of Statistics (see e.g. Bjerve and Selsjord, 1959). Reference can also be made to the Reserve Account in the 1947 report (UN, 1947).

Balance sheets have only been introduced in the most recent set of international guidelines, i.e. the SNA93 and the ESA95. However, several of the early estimates of national income were already accompanied by estimates of national wealth, e.g. those of Petty and King. In the Netherlands, the important estimates of 1938 were also accompanied by a presentation of balance sheets (see Derksen, 1946, p. 15). Of the more recent work, in particular Goldsmith (1951, 1962 and 1985) is outstanding. He also invented the Perpetual Inventory Method in estimating capital stock (see Goldsmith, 1951).

The absence of balance sheets limits the usefulness of the national accounts for various types of applied economic analysis. To name a few: growth accounting and productivity analysis, testing the portfolio theory, estimating vintage models and -more in general- the analysis of intertemporal decisions on investment, saving and consumption (see also Goldsmith, 1985, pp. 65, 66).

The other changes in assets account cover both holding gains and losses due to price changes and changes in the volume of assets which are not related to economic transactions. An examples is damage due to earthquakes, flooding or tornado's. This account is very important for completing the whole national accounting system, and for their links to the financial accounts (revaluation) and to balance sheets. Its information can be crucial to economic analysis and policy. For example, final consumption expenditure of households can

be drastically influenced by their holding gains on equity and dwellings. The introduction of the other changes in assets account in the SNA93 and ESA95 was therefore a major innovation in the international guidelines.

### *Prices and volumes*

Price and volume-data were discussed for the first time in the SNA68 and ESA70. Stone drafted the chapter in the SNA68. It reflected his report "Quantity and price indexes in the national accounts", which he wrote in 1956 at the request of the OEEC (Stone, 1956). A distinctive feature of this report is that it addresses the problem of deflating in the context of a complete set of accounts. It also discusses the problem of measuring real national income when terms of trade are changing. In most other respects, the chapter in the SNA68 on prices and volumes is best regarded as a brief overview of the state of the art. It contains thus a synthesis of all the work done by great pioneers in index-theory and price-measurement, like Fisher, Edgeworth and many others.

Purchasing power parities have only been included for the first time in the current recent set of international guidelines (SNA93 and ESA95). There are two reasons for using purchasing power parities in international comparisons: firstly, the relative prices underlying the national accounting figures may be widely different and, secondly, converting national accounting figures into a common currency by using official exchange rates may lead to misleading results.

In Clark (1940), figures of consumption were made more comparable by using one set of relative prices and by employing purchasing power parities in converting national currencies. In the fifties, under the direction of the OEEC, this work was continued (e.g. Gilbert and Kravis, 1954). In 1968, the UN launched the International Comparison Project (ICP). The purpose of the project was to develop the methods for international comparison of figures of product, income and expenditure and to make such comparisons for a selected group of countries. The ICP has gradually evolved into a joint effort of several international organisations (UN, World Bank, EC, OECD) and many individual countries. The number of countries involved has increased to 139. For a general overview of the ICP, we refer to Kravis (1984).

Also the chapter on prices and volumes in the SNA93 by Peter Hill should be recalled: "In twenty-seven pages, Hill has managed to accurately summarise a vast literature in an elegant and readable fashion... It will be an invaluable reference for not only national accounting specialists but also for students and practitioners of economics in general" (Diewert, 1996, p. 271). Detailed references to the literature summarised by this chapter can be found in Diewert (1996).

### *Input-output tables*

Input-output tables were introduced for the first time in the SNA68 and ESA70. Stone drafted the chapter on input-output in the SNA68. It reflected his report "Input-output and national accounts", which he wrote in 1961 at the request of the OEEC (Stone, 1961). This report showed how input-output tables could be fitted in a complete system of national accounts. For this purpose, he used the matrix, which is the standard way of presenting input-output tables, for presenting the whole accounting system. This matrix is now commonly referred to as Social Accounting Matrix or National Accounting Matrix (see below). In the SNA68, the matrix-presentation was used to present an overview of the whole accounting system.

An important element in linking input-output tables to the national accounts, was Stone's distinction between input-output tables that contain observations (supply and use tables) and input-output tables useful for analysis (symmetric input-output tables). Only the former have a direct link to the rest of the national accounts. He also showed which



assumptions are needed to transform the tables that contain observations into one useful for analyses.

Stone's report of 1961 includes also a detailed discussion of valuation problems. It introduces the concepts of basic prices and purchasers' prices to supplement the traditional distinction between market prices and factor costs. These new valuation principles were also adopted by the SNA68 and ESA70.

In the ESA70 no distinction is made between input-output tables for observation and for analysis. Only one type of symmetric input-output table is presented: a product by product table ("homogeneous branch by homogeneous branch") which does not have any straightforward relationship to the rest of the accounting system. So, the innovation suggested by the SNA68 was not incorporated in the ESA70 but only much later, i.e. in the ESA95.

In both the SNA68 and ESA70, a rather formal and mathematical approach is taken for presenting input-output tables. In the SNA93 and ESA95, the presentation is much more operational and concrete. In this respect, they differ fundamentally from standard textbook discussions on input-output tables (e.g. Miller and Blair, 1985). In the ESA95, it is stressed that not only symmetric input-output tables but also supply and use tables can be used for economic analysis: both tables have different merits for economic analysis (ESA95, 9.13). In the SNA08 and ESA09, the supply and use tables are presented as the core of the input-output framework.

### *Welfare*

In the late sixties and the beginning of the seventies, national income was frequently criticised for not being a welfare measure<sup>35</sup>. However, the authors of the international guidelines did not intend to provide a measure of economic welfare. For example, Jaszi even regards as one of his principal contributions to have resisted successfully to "the will-o'-the-wisp of forging national output into a measure of economic welfare. I was a minority of one in a company that included such mental giants as Simon Kuznets and John Hicks, and at one point I had to defy a forceful Secretary of Commerce who had instructed the BEA [Bureau of Economic Analysis of the USA] to prepare a measure of welfare"<sup>36</sup>. According to Okun (1971), "[the] beauty of ... present practice is that no sensible person could seriously mistake the GNP for [a measure of total social welfare] ... Producing a summary measure of social welfare is a job for a philosopher-king". Also Denison (1971) stressed some fundamental problems for a welfare measure: "relations between environmental conditions and welfare are rarely linear, and nonlinear relationships are hard to establish. A little air pollution is harmless, more an annoyance, a great deal is lethal".

In 1972, Nordhaus and Tobin illustrated in an impressive way what accounting aimed at measuring welfare would imply. They calculated a Measure of Economic Welfare (MEW) by modifying traditional national income figures in several respects. For example, they deducted an estimated value of the disamenities of urbanisation and they added tentative estimates for the value of unpaid household services.

Since then, many measures similar to MEW have been calculated (see Eisner, 1988). Frequently, these measures were presented as part of extended or total accounts. Measuring the contribution of economic activity to welfare is only one of the reasons for drawing up such accounts. Some other motives are to obtain: "more inclusive and relevant measures of capital formation and other factors in economic growth, and better and/or additional data to fit concepts of consumption, investment, and production relevant to economic theory and structural econometric relations" (Eisner, 1988, p. 1612).

<sup>35</sup> For example, Mishan (1969). An example of an earlier critique is Margolis (1952). For an overview of major studies stressing the limitations of GDP as a proxy of welfare, see van den Bergh (2008).

<sup>36</sup> Jaszi (1986), p. 411. A similar opinion is expressed by Stone, 1974, and by Stone, 1986, p. 457.

The increased use of social indicators like the Human Development Index (UNDP, 1991) is a somewhat related development. In these social indicators, national income (per capita) is only one of the variables, other variables being e.g. infant mortality, life expectancy and adult literacy rates. In contrast to measures like MEW and National Income, social indicators are not measures in money terms; they serve solely as indexes.

Also several partial approaches have been developed. Such partial approaches start from standard national accounting concepts and statistics and introduce then modifications stressing one specific issue or perspective, e.g. unpaid household services and the environment.

In 1978, Adler and Hawrylyshyn, calculated that unpaid household services was equivalent to about 40% of Canada's GNP in 1961 and 1971. They suggested that the relative importance of unpaid household services was not declining and that therefore any retrospective inclusion of such services would not alter past patterns of growth in Canada.

Similar calculations have now been made for many other countries. For example, Bruyn-Hundt (1995) estimated the value of unpaid households services in the Netherlands for 1975, 1980, 1985 and 1990 on the basis of time use surveys. She employed three different valuation principles: minimum wages, wages of home help and average earned wages. The estimates varied from 67% of GNP in 1975 to 108% of GNP. According to all three valuation principles, the value of unpaid household services had declined substantially in 1990: the estimates ranged now from 51% of GNP to 91% of GNP. This decline reflects the increased participation of women in paid work. The estimates for the Netherlands are higher than for other countries, as labour market participation of women in the Netherlands was then still relatively low.

Hueting (1980) stressed the economic importance of pollution and depletion of natural resources. Hueting (1991) developed a concept of Sustainable National Income (SNI): the maximum income that can be sustained without technological development and excluding the use of non-renewable resources. According to Verbruggen et al. (2000), Dutch Sustainable National Income was in 1990 56% below the official Dutch national income. The purpose of the SNI is not to provide the policy-makers with a goal for national income as such, but to indicate the sustainability gap based on current technology.

### *Design of the accounting system*

In Sweden, in the beginning of the fifties, Ohlsson argued that the design of the ideal accounting system should depend on the specific purpose served (see Ohlsson, 1953 and Aukrust, 1994). For example, for analysing economic behaviour, the production boundary should only include monetary transactions. However, for analysing 'results', non-market production should be included whenever feasible. He concluded that there are three alternatives for presenting official national accounting statistics:

"1. the construction of a general purpose NA-system from which to extract the special purpose systems

2. the construction of different NA-systems for different purposes

3. the construction of one special purpose NA-system with a list of corrections for the main items for which different treatment for different purposes is required.

... Ohlsson admitted, that a general purpose system (alternative 1) could be constructed ... "for all reasonable purposes". However, this would be "an extremely complex matter". For his empirical work Ohlsson preferred different systems for different purposes (alternative 2)" (Aukrust, 1994, pp. 39 and 40). However, Ohlsson's work in these directions was not followed up internationally and remained for long an episode even in Sweden.

### *SAM and micro-macro linkage*

The Social Accounting Matrix (SAM) concept originates from the sixties and was developed as part of the "Programme for Growth" at the university of Cambridge (UK) (Stone, 1962)<sup>37</sup>. This work was also supervised by Stone. In SAMs, the national accounting system is presented in a matrix format and the input-output tables are fully integrated in the accounting system. Using a matrix for presenting a national accounting system was a distinctive feature of Stone's work.

In 1976, Pyatt and Thorbecke, in a project on behalf of the International Labour Office (ILO), used SAMs as an instrument for development planning (see Pyatt and Round, 1977). They gave a fresh and new view on the content and applications of a SAM (see also Pyatt, 1991). In their view, compiling a SAM is the best way to obtain a rather complete and consistent set of data for modelling the national economy. Furthermore, in particular for developing countries, it is necessary to introduce income distribution, poverty and demographic changes in models and accounting systems. In order to explain income distribution, also employment should be included. In all these respects, they judged the scope of the SNA68 as too narrow. Or, to put it in other words, they preferred a system which integrates aspects of the 1968 SNA as well as of Stone's System of Social and Demographic Statistics (SSDS; UN, 1975 and Stone, 1971). A distinctive feature is that achieving internationally comparable figures is of secondary importance: international concepts and classifications should be used only to the extent that they suit the national data needs and possibilities. This reflects the focus on modelling the national economy for policy purposes.

Until recently, SAMs have only been compiled for developing countries that are more or less Anglo-Saxon in orientation, like Pakistan and Indonesia. The SAM has not yet been implemented in the more French oriented developing countries, like those in Africa.

The Social Accounting Matrix-concept was included for the first time in the most recent set of guidelines. In 1994, under the supervision of the author of the SAM-chapter in the SNA93 (Steven Keuning), the SAM was introduced for the first time in the national accounting practice of a developed country, i.e. the Netherlands<sup>38</sup>. A distinctive feature of this SAM is the absence of a direct link to modelling for policy purposes. A major reason is that Dutch model-builders do not meet the data problems common in developing countries: they can make use of a wide range of readily available national accounts statistics and of various sets of micro-economic data (tax records, survey results). As a consequence, they do not need an intermediate data set and can analyse income distribution much better and in much more detail (e.g. reflecting the specific features of the Dutch tax and social security system). For developed countries, compiling a SAM boils therefore mostly down to compiling labour accounts, i.e. a detailed and systematic breakdown of the values and volumes related to employed and unemployed labour.

Since the seventies, the importance of micro-macro linkages for households and business has been stressed by Richard and Nancy Ruggles (see e.g. Ruggles, 1971, 1990 and 1996; Ruggles and Ruggles, 1970, 1986, 1992 and 1999). In their view even the basic concepts in the national accounts should be close to micro-economic concepts for households

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<sup>37</sup> An interesting off-shoot of the Cambridge Programme for growth was the development of the RAS-method for balancing input-output tables. The name giving of this method reflects the role of Richard Stone. The method consists of multiplying the general matrix A with two other matrices. The latter are called R and S, because these are Stone's initials. However, unknown to Stone and many of his contemporaries, Deming already suggested this algorithm twenty years before (Deming, 1943).

<sup>38</sup> It was not the first time that a SAM was compiled for the Netherlands. Already in 1982, inspired by Pyatt and Thorbecke, an incidental estimate of a SAM for the Netherlands was made by the scientific council for government policy (von Eije, 1982).

and business, i.e. closer to market transactions and containing much less imputations and attributions. They propose e.g.:

- to exclude employers' contributions to pension reserves from household income but include the payment of pension benefits.
- to treat interest not as a transfer, but as the purchase of financial service<sup>39</sup>;
- to regard the purchase of consumer durables as capital formation and to make imputations for these services.

They also stress the importance of a relatively simple set of accounts and criticize the complexity of the new universal accounting framework<sup>40</sup>:

“These ... accounts are designed to answer “Who does What by means of What for What purpose with Whom in exchange for What with What changes in stocks?” Given this level of complexity, there is a distinct danger that when the revised SNA is actually put in place, it, like the Hubble telescope, may not be successful in bringing into focus a clear view of what it was designed to examine. Only professional national accountants will be able to fathom the national accounts. Furthermore, the establishment of such an elaborate system as the standard to be adopted by national and international statistical offices may result in the SNA becoming a statistical behemoth independent of its creators and with an illogic of its own-not unlike a Frankenstein monster. One of the major virtues of national accounting systems used by many countries is that they do provide a relatively simple macroeconomic overview of the economic system” (Ruggles, 1990, p. 419).

#### *Satellites and modules*

In the mid-seventies, the French statistical office developed several satellites supplementing the national accounts. Each of these satellites describes a specific aspect of a national economy, e.g. education, health or transport. These satellites were focused on serving the data needs of specific Ministries (INSEE, 1976, see also Vanoli, 1986).

A decade later, the notion of a building-block system for the national accounts was taken up by the Dutch Central Bureau of Statistics<sup>41</sup>. They advocated that the structure of the revised SNA should be made more flexible. In their view, the SNA should contain a multi-purpose core supplemented with special modules. This core is a full-fledged, detailed system of National Accounts with a greater institutional content than the 1968 SNA and a more elaborate description of the economy at the meso-level. The modules are more analytic and reflect special purposes and specific theoretical views. Such a system has some clear advantages: there would be room for extended measures, linkages to other accounting systems

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<sup>39</sup> The major advocate of this proposal is actually Sunga (1984).

<sup>40</sup> Two decades before, a similar criticism about the complexity and cost-inefficiency of the international guidelines was made by Denison: “for every series of any real interest that is developed, at least a dozen series of trivial or no value must be estimated to fill out the “accounts”. Because most of the series called for are of no appreciable interest, existing systems of data collection do not provide the information required by the new SNA (F.B.: SNA68); either collection of trivial data would be required or the number would have to be imaginary. The new SNA has another weakness: it is so complicated that not even serious and expert users of national income and product data (and few producers for that matter) can be expected to understand it or the meaning of the numbers it is to contain. A very simple set of account ..., supplemented by supporting tables to provide analytically interesting detail and alternative breakdowns, is a far better approach, in my opinion” (Denison, 1971, p. 38).

<sup>41</sup> On the Dutch view on national accounting, see e.g. Van Bochove and Van Tuinen (1986), Gorter (1988), Gorter and van der Laan (1992), Reich (1993), Den Bakker (1994) and Bos (2006).

like the SDSS (UN, 1975) could be explicitly shown, a clear micro-macro link could be established and national data needs and possibilities could be taken into account.

A problem with understanding the Dutch view, e.g. vis-à-vis the old or current international guidelines, is that most of the papers are mainly about general principles and desiderata. The only concrete proposal for a Dutch core can be found in Gorter and van der Laan (1992, pp. 200-209). They propose to omit imputations like the services of owner-occupied dwellings, transfers in kind and the rent imputed to insurance policy holders as property income. The consumption of the services of pension funds and life insurance companies should be registered with the financial institutions themselves. These proposals do indeed reduce the number of imputations. However, it should be realized that many important imputations in the SNA68 and SNA93 are not disputed, e.g. the valuation of government output and the output of financial institutions. Furthermore, various suggestions for a more micro-economic perspective (see above) are not included in this Dutch core.

In the SNA93 and ESA95, the general idea of a building-block system has been incorporated. For example, the SNA93 contains a separate chapter on satellite accounts which is to be supplemented by various handbooks, e.g. on environmental accounting. The proposals for a closer linkage to micro-economic concepts and less imputations in the basic set of accounts have not been honoured. In fact, even some new imputations have been added, e.g. reinvested earnings on direct foreign investment.

The SNA08 and ESA09, the general idea of a building-block system has been further developed in two ways. Firstly, for some major standard uses (e.g. government finance and balance of payments) separate chapters are now incorporated. Secondly, in ESA09 now also a chapter on satellite accounts has been introduced. This chapter and the one in SNA08 are more elaborate and specific than the old chapter on satellite accounts in SNA93.

### 3.5 Summary

Directly after the Second World War, the major innovations of the 1930s and 1940s were tested and further improved. On request of the OEEC, in 1951 a guideline on national accounting was written which was to be used in planning the Marshall-aid. This guideline and its two immediate successors (1952, OEEC and 1953, UN) can be regarded as the first generation of official international standards. In contrast to the 1947 UN report, rather simple accounting systems were aimed at. In fact, a systems approach was nearly absent as only some aggregates and their composing parts are to be compiled; the financial flows in the national economy are even nearly fully ignored.

A second generation of official guidelines was issued at the end of the sixties and beginning of the seventies. It consisted of two guidelines by the UN: the Material Product System (MPS69) used by communist countries and the System of National Accounts of 1968 (SNA68) used by the rest of the World. For the special purposes of the European Communities, also separate guidelines were issued for EC-countries, i.e. the European System of economic Accounts of 1970 (ESA70). The SNA68 and ESA70 followed mainly the trails set by their predecessors but greatly expanded the accounting system, e.g. by including also input-output tables and constant prices. The MPS69 differed fundamentally from all the other guidelines by its anachronistic concept of production that focuses on measuring only material production. Nevertheless, with respect to the other concepts and the scope covered, the MPS69 was sometimes even more advanced than the SNA68 and ESA70 (e.g. total consumption of the population).

In 1985 Richard Stone was awarded the Nobel price in economics for this contributions to the national accounts, in particular for his leading role in the development of the first and second generation of international guidelines.

About a decade ago, a third generation was issued, the SNA93 and ESA95. The SNA93 and ESA95 have again greatly expanded the scope of the international guidelines by including e.g. balance sheets, purchasing power parities and satellites. A revised version of the MPS69 was not necessary due the collapse of communism in Eastern-Europe. All countries in transition in Eastern Europe are now implementing the SNA93 and, for those who want to apply for membership of the EU, the ESA95.

At present, the major part of a new update of the SNA (SNA08) has already been finalized, while work is still to be done on some chapters. The updating process of the European guidelines has just started and the final draft is intended to be completed in 2009 (ESA09).

By their rapid expansion of scope since the guidelines of the fifties, the most recent set of guidelines have incorporated most of the major innovations in national accounting since the Second World War. If we disregard the MPS69, basic concepts in the guidelines have shown a remarkable consistency, e.g. excluding the services of unpaid household services. Some of the criticism on unchanged basic concepts has been met by introducing satellites, e.g. on the link between environmental indicators and national accounts statistics. Nevertheless, some important changes in concept have also occurred, e.g. the introduction of chain indices or the expansion of the concept of capital formation to include software, mineral exploration and Research and Development.

## 4. STATISTICAL DEVELOPMENTS SINCE THE SECOND WORLD WAR

*Expanding, standardising and institutionalising national accounts statistics*

### 4.1 Introduction

Since the Second World War, the national accounts statistics published by countries all over the world have changed drastically in scope and concepts. These developments in national practice do not have a straightforward relationship to the international guidelines. They are discussed in section 4.2.

Since 1989 national accounting in Europe has been revolutionised as a consequence of the ongoing European unification. These very recent developments are the topic of section 4.3. A summary of the statistical developments since the Second World War is provided in section 4.4.

In view of the current literature on national accounting, the value added of this chapter is in particular the overview provided of the recent developments in Europe. The revolutionary nature of these developments (e.g. the emergence of real jurisprudence and the active monitoring of the reliability of the national accounts statistics) is hardly recognized by national accountants and non-national accountants.

### 4.2 General trends

Since the Second World War, the number of countries for which estimates of national income are available increased from 42 in 1946, to 92 in 1957 and at present national accounts figures are available for over 150 countries. However, the scope, detail, reliability and frequency of these data differ widely.

#### *Scope*

For example, since the fifties countries like Norway, Denmark, the Netherlands and France<sup>42</sup> publish annually input-output tables. As indicated in section 3.3, input-output tables were incorporated for the first time in the international guidelines in the SNA68 and ESA70. However, even now, several decades later, only a few more countries publish annually input-output tables, e.g. the UK has recently started (again). For a somewhat larger group incidental but usually rather outdated input-output tables exist. This applies e.g. to the USA.

A similar story can be told for the detailed sector accounts proposed by the SNA68, the ESA70 and the most recent international guidelines. Even now, a great majority of the countries in the world only apply rather simple accounting systems of the SNA53-style. However, the appearance of the most recent set of guidelines seems to be a great stimulus for introducing more detailed sector accounts.

Substantial differences in country practices exist also with respect to specific national accounts statistics, like regional accounts, quarterly accounts, satellites and balance sheets. In some countries, all of them are regularly published (e.g. in the Netherlands, France and Canada). In a somewhat larger group, some of them are regularly published, while in most countries hardly any data are regularly published on any of these topics.

Our remarks with respect to the input-output tables and the sector accounts reveal that most of the international guidelines have been much more ambitious and encompassing than

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<sup>42</sup> A very interesting survey of the post-war developments in France can be found in Demotes-Mainard and Bournay (1994). A more extended overview is given by Vanoli (2005).

the national accounting practice of their time. This partly reflects their role as a pedagogical device and innovative instrument<sup>43</sup>. The only exceptions are the very simple guidelines of the fifties and the MPS69. In the case of the MPS69, even the reverse situation seemed to hold: the accounting systems of most communist countries had a larger scope than the MPS69 and provided more detail (see Arvay, p. 224).

The guidelines also interact with successful compilation practice. For example, in the Netherlands, the oil crisis of 1973 stimulated the transition towards chain indices for price and volumes in the early eighties (see Al et al., 1985, Boer et al. 1997 and Bos, 1994c). The use chain indices is now recommended by SNA93 and ESA95. Some other examples, e.g. with respect to satellites, can be found in section 3.4.

#### *Harmonisation due to the guidelines*

The guidelines have greatly contributed to harmonisation of the concepts used by countries in compiling major aggregates, like National Income.

This is evidenced by some of the earlier country practices. They all differed fundamentally from the basic concepts in the successive guidelines:

- In Sweden in 1937, Lindahl published two alternative estimates of national product, one including the services of unpaid household services and one excluding. However preference was given to the latter. In Norway in 1946, the value of unpaid household services was included in output and national product. However, since 1951 they are excluded (see Aukrust, 1994).
- In some official Scandinavian studies (1937, 1951, 1953), the services of consumer durables like cars were included in output (see Aukrust, 1994).
- In France, until 1975 when the ESA70 was implemented in the French national accounts, the value of the output by banks, insurance companies and general government was not included in output and domestic product (1971 base; see Demotes-Mainard and Bournay, 1994).

Due to the influence of the international guidelines, country practice to include in the national accounts' estimates unpaid household services and the services of consumer durables was gradually extinguished.

However, as the French case shows some drastic differences between country practice and the international guidelines existed unto the seventies. Furthermore, if we look at the changes in the international concepts, some important differences continued to exist for many years. For example, in contrast to the SNA68 and ESA70,

- Many countries continued up to 1995 to apply concepts of the SNA53, i.e. to include an imputation for the services of government buildings and to allocate financial intermediation services indirectly measured (FISIM). In the EU, in order to bring their estimates in line with the ESA70, Greece and Belgium had to abolish this practice. Now a new EU-regulation prescribes that FISIM is to be allocated.
- Before implementing SNA93, the USA did not classify government expenditure on durables as capital formation (and capital consumption) but as intermediate consumption by the government.

The transition to the concepts of the new international guidelines will bring about a greater degree of harmonisation, e.g. the USA will change its treatment of government expenditure on durables and many countries are starting to fully rebuild their accounting systems according to the most recent international standards. Nevertheless, some differences are likely to continue, e.g.:

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<sup>43</sup> It also reflects the totally different amounts of resources in countries available for statistics in general, and for national accounts in particular.



- Some countries will allocate the services of financial intermediation services indirectly measured and others will not, as the SNA93 does not choose between both alternatives.
- The USA has identified two potential departures, "treating purchases of weapons and weapon delivery systems as capital formation and estimating a general government operating surplus to reflect a net return to the use of government capital" (see Dobbs and Pitzer, 1994, para 82).

For international comparisons, the differences between the concepts in the guidelines and those in country practice imply that modifications to national data are necessary. This can be done by the country itself when reporting its international questionnaires or by the international organisations involved, like the UN, the EU and the OECD.

### *Reliability*

For a proper use of national accounts figures, it is necessary to know their reliability, e.g. in order to assess whether some changes are statistically significant. Therefore, at the end of the forties, in the Netherlands, Sweden and Norway, official estimates were accompanied by indications of reliability<sup>44</sup>. In the Netherlands, for "every item of the sector accounts the uncertainty margin was given. This margin ranged from 2-5% (reliable estimate) to >20% (crude estimate)" (Den Bakker, 1994, p. 76). In Sweden and Norway, a scale from 1 to 5 was used. Separate indicators were used for the level and trend of time series (see Aukrust, 1994, p. 45). However, this practice was not continued.

The famous study by Stone and Rowe (1954) on the measurement and behaviour of consumers expenditure in the United Kingdom during the period 1920-1938 also pays attention to assessing reliability. For each item of expenditure, a qualitative assessment was made of the reliability and major potential biases of the estimates. Furthermore, for all items, the reliability of the estimates of the quantity, price and value in 1920 and 1938 is indicated by four error classes: A Firm figure (less than 5% margin of error); B Good estimate (between 5 and 10% margin of error); C Rough estimate (between 10% and 25% margin of error) and D Conjecture (more than 25% margin of error). Finally, also a comparison was made with alternative estimates.

Stone (1981 and 1986b) showed that indicators of reliability can also be used for balancing the accounts. This idea seems to have been applied in Italian compilation practice. In other countries, like France and the Netherlands, the balancing procedure is not based on explicit indicators of reliability. The experience and knowledge of the national account's specialists on the reliability of the various estimates is exploited as an integral part of the balancing process. A major element in this balancing process is the plausibility of the estimated development of the national economy and its major components over time. This crucial element was not addressed by Stone's article.

### *Unofficial statistics, often inspired by research interests*

Though national accounts statistics is dominated by official statistics, also some important non-official statistics have been published. Some of them we already discussed under the label of "innovations". This was mostly work that anticipated concepts in the international guidelines or that proposed fundamentally different ones. However, also non-official statistics based on the international concepts play an important role.

They usually intend to fill the *gaps in the officially published national accounts statistics and serve a major role in economic and historical research*. Some major examples can illustrate this.

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<sup>44</sup> The use of reliability indicators was not an original idea. Josiah Stamp's estimates on national income of 1919 already used them systematically. This has inspired their use in Sweden and Norway.

For decades, historical time series on economic growth all over the world are being compiled, collected and commented by Maddison (see e.g. Maddison, 2003). These time series include official estimates but are drastically extended by Maddison for years and countries for which no official estimates are available. For most researchers on long term economic growth, the data sets of Maddison are now the standard reference. A similar situation exist for the Penn-series on purchasing power parities (Summers and Heston, 1991). All these figures have played an important role in systematically examining the validity of alternative theories of economic growth (e.g. new growth theory). They have also been used for testing via cross-country growth regressions the importance of an sheer endless range of variables that might influence economic growth (e.g. education, health, war, monetary policy, corruption, democracy, geography, ethnicity and inequality).

The classic study *A Monetary History of the United States 1867-1960* by Friedman and Schwartz (1963) is a major example of compiling statistics for research. Based on analysis of these statistics, they argued that money plays an important role in generating cyclical fluctuations and that the severity of the Great Depression was in large part due to the mistakes of the Federal Reserve. The book launched monetarism, had a major impact on monetary policy all over the world and demonstrated that historical study combined with compiling statistics can be an important tool of macro-economic research.

Inspired by the work of Kuznets, a national accounts approach has also been applied to Dutch economic history. The national accounts framework is very suitable to check, combine and complete the limited, patchy and heterogeneous historical information, like tax returns, household budget data, import and export figures, occupational censuses and company archives with price lists, wage-rates and company accounts. In 1990, Dutch economic historians started a major project to reconstruct historical national accounts for the Netherlands. This has resulted in numerous publications and a data base with national accounts figures on the development of the Dutch economy in the period 1500-1913 (see e.g. van Zanden, 1993 and Smits, Horlings and van Zanden, 2000). These Dutch historical accounts include a breakdown of national income by industry (agriculture and various types of manufacturing and services), by type of income (wage income and income from capital) and by type of expenditure (capital formation, government final consumption and private final consumption). In contrast to current official national accounts, national income includes – partly for practical reasons– all production, income and consumption both inside and outside the market sector, e.g. unpaid household services. This work, and similar work in other European countries, has put an end to the simple idea that there was a one-off break in the economic development which separated the traditional and static economy prior to the industrial revolution from the dynamic and modern economy after it.

Non-official figures based on the international concepts may also *try to improve the official estimates* by using other data sources or other estimation procedures. Examples of this are:

- the standardised productivity estimates compiled by Maddison and van Ark (1994): in order to obtain consistent productivity estimates, they use the same data source for estimating output and employment; this link between output and employment is indeed a frequent weakness of the official figures, see above;
- the estimates of harmonized price indices for ICT capital goods in nine OECD-countries by Collechchia and Schreyer (2002). The price indices of ICT capital goods of various countries are only partly or not at all based on hedonic methods. In order to control for such differences in statistical methodology, the price indices were calibrated around the United States ICT prices indices. In this study also estimates are made for missing data, e.g. time series and separate price indices for the business sector.

- official estimates of GNP corrected by adding guesstimates of the black economy assumed to be missing in the estimates (the Economist).

Another group of national accounts statistics are those based on alternative concepts. Major examples are the extended –more welfare oriented accounts- by Eisner (1988) and estimates of economic growth corrected for Douglas North’s notion of transactions costs (see Fuess and van den Berg, 1996).

A special category are the KLEMS databases on growth and productivity, which combine official and unofficial statistics. For better measuring, analyzing and monitoring growth and productivity, KLEMS Growth and Productivity Accounts are being developed all over the world. A key-objective is to move beneath the aggregate economy level and examine the productivity performance of individual industries and their contributions to economic growth. In order to reveal the enormous heterogeneity in output and productivity growth across industries, a very substantial amount of different industries (e.g. 72 in EU-KLEMS) are distinguished. The accounts will include quantities and prices of output, capital (K), labour (L), energy (E), material (M) and services (S) inputs at the industry level. Output and productivity measures are provided in terms of growth rates and (relative) levels. Additional measures on knowledge creation (R&D, patents, embodied technological change, other innovation activity and co-operation) will also be developed. These measures are developed for individual European Union member states, and will also be linked with “sister”-KLEMS databases in the US, Canada, Asia, Africa and Latin-America.

The accounts will consist of two interdependent modules: a statistical module and an analytical module. The analytical module provides a (research) data base at the highest possible quality standards for use in the academic world and by policy makers. It uses “best practice” techniques in growth accounting, focuses on international comparability, and aims at full coverage (in terms of number countries, industries and variables). It will also consider alternative or pioneering assumptions regarding statistical conventions, e.g. with respect to ICT goods, non-market services or the measurement of capital services.

The statistical module of the data base will be developed parallel to the analytical module. It includes data which are as much as possible consistent with those published by national statistical institutes. Its methods will usually correspond to those in the central framework of the national accounts, e.g. supply and use tables are used as the coordinating framework for productivity analysis, chain indices are applied and software is capitalized. However, minor deviations may occur, e.g. the output of non-market services may be modified by taking capital services into account (differently). The statistical module may not only include national accounts data, but also various supplementary information, e.g. employment statistics on the quantity (persons and working hours) and quality (distribution of quantities by age, gender and education level) of labour input per industry.

#### *National data needs*

The official national accounts statistics of various countries differ substantially in terms of scope, detail, frequency and reliability. These differences reflect substantial differences in the roles played in national policy. Relatively encompassing, detailed, frequent and reliable national accounts statistics generally reflect that they play a relatively important role in national policy. This applies e.g. to France and the Netherlands. Relatively simple national accounts statistics reflect a minor role.

Nevertheless, rather similar sets of official national accounts statistics may still correspond to rather different roles in national policy. Compare for example the role of national accounts statistics in Netherlands and France. The role of the national accounts in France is much more important as it has permeated the whole French government administration and even the French business accounts. In the Netherlands, the central

government administration employs national accounting concepts since the fifties. However, national accounting concepts are considered irrelevant for the administration of the local government and the business accounts.

### 4.3 The European revolution

The ongoing process of European unification has created a large and increasing demand for economic and social statistics on Member States. This pertains to national accounts statistics as well as to many specific economic and social statistics. A European Statistical Office (Eurostat) was established in 1958 (on the European Community and its statistical system, see DeMichelis, 1993). The first European guidelines on national accounting were issued in 1970; a second edition appeared in 1979. Now regularly a limited set of national accounts statistics on the Member States are published.

Since 1989, five major developments have revolutionised European national accounting:

1. The GNP Committee;
2. New European requirements on major inputs for the national accounts, e.g. new regulations on business registers and various statistical surveys;
3. The new European guidelines on national accounting (ESA95);
4. The European statistical programme for national accounts statistics.
5. The European Monetary Union.

#### *The GNP Committee*

In 1989, the Member States' GNP figures became the basis for a new, fourth, own resource of the Commission. This fourth resource will gradually become the Commission's largest financial (budgetary) resource. A committee consisting of representatives from all Member States was created to validate and help improving the quality and comparability of the Member States' GNP estimates.

This GNP Committee has initiated a lot of pioneering work:

- Discussions and jurisprudence on the proper interpretation of ESA concepts. For example, Commission Decisions on the interpretation of the ESA79 were issued with respect to taxes on products and services of owner-occupied dwellings;
- Documentation of the Member States' data sources and methods for compiling GNP. Such quite accurate, complete and up-to-date descriptions did not exist in most Member States and hardly exist anywhere in the world.
- Auditing missions to validate the quality of the Member States GNP figures and the compliance with the ESA79;
- Discussions of the Commission's auditing reports in the GNP Committee;
- Discussions on the merits and limitations of various types of data sources and estimation methods for compiling GNP figures;
- Discussions and concrete proposals on how to estimate some well-known problem areas in the national accounts, e.g. the underground economy, services of owner-occupied dwellings, income in kind and inconsistencies between the Foreign Trade Statistics of EU-member states; a Commission Decision even prescribed how to estimate the services of owner-occupied dwellings;
- Validation of employment underlying the Member States' GNP estimates on the basis of alternative estimates of employment.
- Conceptual modifications in order to comply with the ESA79 instead of the SNA53 (i.e. the guidelines of 1953 were still applied by some Member States!).

- Drastic revisions of the national accounts in some Member States; they also resulted in sizeable adjustments in the GNP estimates, e.g. 10%.

The success of the GNP Committee has been possible thanks to a combination of various factors:

- The political and financial pressure on making clear progress;
- The existence of a legal framework for the GNP Committee and the possibility to legalise some of its proposals in the form of Commission Regulations;
- Confidentiality of the country-specific discussions, reports and inventories<sup>45</sup>;
- Money to compensate the Member States for all the extra work imposed by the GNP Committee, e.g. the writing of inventories and reports, responding to detailed questionnaires, validating employment underlying GNP estimates and improving the estimation methods. For some Member States, also a substantial amount of technical assistance was arranged.

**Table 4.3 Use of national accounts statistics for European policy**

Policy area	Which national accounts statistic?
Monetary policy and public finance	Government deficit and debt as a percentage of GDP Financial accounts showing e.g. the size of new mortgages and loans by corporations
Productivity and growth policy (Lisbon agenda)	Economic growth, expenditure on Research and Development as a percentage of GDP, EU-KLEMS
Social policy	Social protection statistics closely linked to national accounts concepts
Regional policy	Regional product per capita is yardstick for granting regional funds
Agricultural policy	Agricultural accounts showing also the development of farmer income
Development aid	Low domestic product per capita is a yardstick for granting aid
Defense policy	Expenditure on defense as a percentage of GDP
Maximum total expenditure by EC	Percentage of GNI (about 1%)
Member states contribution	Percentage of GNI (but some other EC-own resources exist, e.g. import duties)

#### *New requirements on inputs for the national accounts*

A major change also took place in the inputs for the national accounts. For good-quality GNP estimates, an up-to-date and complete business register and statistics covering major parts of output, expenditure or income are indispensable. The work of the GNP Committee revealed that in many Member States business registers needed improvement and that the coverage of their basic statistics showed some major lacunae, in particular with respect to the services industries. Recently, regulations were issued by the Commission covering also these weak and for the national accounts very important areas. So, in some years time, it will be much easier for EU-national accountants to make good GNP estimates.

The degree of involvement of Eurostat with the Member States' statistics range widely. Traditionally the role was limited to disseminating the Member States data, to issue guidelines on concepts and classifications and to initiating regulations on the scope of the data to be submitted. The fourth own resource has started the active monitoring and auditing of the concepts, data sources and statistical methods used by the Member States in compiling GNP

<sup>45</sup> However, several inventories of Member States have been made public by the Member States themselves, e.g. by the Netherlands (Bos and Gorter, 1993).

figures. The European experience also reveals an even more active role by Eurostat in achieving comparable statistics: *the processing of the Member States' data by Eurostat*. The latter occurs now for the harmonised Labour Force Survey, the purchasing power parities and the estimates for the EU as a whole, e.g. quarterly accounts.

Deregulation is also part of the process of European unification. In particular the removal of the customs formalities at the intra-EU borders is having significant consequences for compiling the national accounts (see Bos, 1992c and 1996b). The European experience can teach about the consequences of customs-unions and free trade zones for the national accounts.

In order to establish a single European market, on 31 December 1992 customs formalities at the intra-EU borders were been abolished. At the same time, a new system to register imports and exports of goods between Member States has come into force: the Intrastat-system. Under the Intrastat system, enterprises are obliged to send a monthly statistical declaration on intra-community trade in merchandise to the relevant administration in each Member State. The replacement of customs data on intra-EU trade by Intrastat-information has had direct effects on the Foreign Trade Statistics: they became in most Member States less detailed, less accurate and less timely.

The Foreign Trade Statistics are a major data source for the national accounts statistics. They are not only used for estimating imports and exports, but -as they are very detailed and available monthly and with limited delay- they also play a major role in balancing the accounts and in compiling figures on other variables via commodity-flow estimates (e.g. production and value added). This applies both to short term figures, to the annual accounts and to the detailed input-output tables. Furthermore, imports and exports figures play an important role in the expenditure estimates of GDP.

The quality of the Foreign Trade Statistics changed due to the abolition of the intra-EU customs borders (see Bos, 1996). However, assessing the net effect of the introduction of the Intrastat-system is not straight-forward, for various reasons:

- some of the problems are temporary;
- some Member States do not seem to have serious problems;
- the Intrastat-system offers opportunities that are perhaps not fully exploited by the national accountants (e.g. for linking imports and exports figures with other data at the enterprise level);
- the Intrastat-system is now being reconsidered;
- and inconsistencies between the imports and exports figures of trading partners already existed before the Intrastat-system.

The Intrastat-system may therefore also be a stimulus to reconsider present national accounts compilation strategies and be more critical about the former Foreign Trade Statistics: their detail and timeliness suggested an illusory degree of accuracy and completeness (see also van Bergeijk, 1995).

### ESA95

The third major development in European national accounting was the ESA95. Immediately after the completion of the SNA93, the drafting of the new European guidelines on national accounting (ESA95) started. The final draft was officially approved by the Member States's statisticians in 1995; it will be published in 1996. The ESA95 is fully consistent with the SNA93 but has some clear value added for EU Member States, and also for national accounting in general.

A novelty of the ESA95 is that it is part of an official regulation of the EU and thus a *legal document*. This contrasts with the SNA93 and ESA79: these are 'gentlemen's-agreements' (although their application is binding in some situations). The explicit legal

character of the ESA95 is necessary considering the many and important administrative uses made of the national accounts figures.

This pertains not only to the fourth own resource and the entrance criteria for the European Union. Examples of other administrative uses by the European Union are:

- The ceiling for the total own resources of the European Commission is determined as a percentage of the Member States' GNP figures;
- At present, the major own resource of the Commission is the VAT-own resource. The contributions by the Member States for this resource are largely affected by the national accounts figures (in order to calculate the average VAT-rate);
- The sizeable expenditure for the Structural Funds of the European Union (granted to 'poor' and backward regions) are based on regional national accounts figures (regional domestic product per capita);
- Several other types of expenditure by the Commission are indexed or linked to national accounts figures, e.g. those on Research and Development.
- The contributions by the national central banks for financing the European Monetary Institute ('the European central bank') are based on GDP figures (and on population figures).

In several respects, the ESA95 is *more accurate and precise* than the SNA93 (for a comparison of the ESA95 and the SNA93, see also ESA95, paragraph 1.24). This reflects not only the different styles of presentation. It reflects also the focus of the ESA95 on economies in Europe instead of on the whole world and the fact that ESA95 was written some years later (accurate phrases in SNA93 were often copied and several inaccurate ones and minor errors were modified for the ESA95; lessons were also learned from the conceptual and practical problems raised in the GNP Committee). It also reflects *the European need to have stricter rules and a greater degree of conceptual harmonisation than exist at the world level*.

The major example of the latter pertains to the distinction between market and other non-market. This distinction is important for both the sector classification (e.g. the sector government) and the measurement of output, value added, GDP and GNP. In drafting the SNA93 no agreement could be reached on a clear-cut definition and a rather general and vague phrasing was introduced. For European purposes, such a definition was not acceptable considering the uses made of the national accounts figures, e.g. for the GNP own resource and the European Monetary Union. The ESA95 contains therefore a much clearer and stricter distinction between market and other non-market (though there are still some problems of interpretation and application). Another example pertains to the consumption of the Financial Services Indirectly Measured: the SNA93 leaves a choice, while the ESA95 chooses one method of allocating these services.

#### *New European statistical programme for the national accounts*

The fourth major European development pertains to the European statistical programme for national accounts statistics. The ESA95 was accompanied by a statistical programme for the national accounts statistics. This programme obliges Member States to compile an extensive set of national accounts statistics, e.g. quarterly accounts, supply and use tables, a whole range of sector accounts and regional accounts. For most Member States, meeting the demands of this statistical programme will imply a massive effort, as it amounts to a drastic extension and speeding up of the national accounts statistics presently compiled. As a consequence of this ambitious statistical programme, a much more balanced set of national accounts statistics is available for the EU-Member States.

### *European Monetary Union*

The fifth major development in Europe was the use of national accounts figures as criteria for the European Monetary Union. Government deficit (i.e. net lending by the sector general government) should not exceed 3% of GDP and government debt should not exceed 60% of GDP or show a downward movement towards this percentage. This has stimulated the work of the GNP committee<sup>46</sup> and other Eurostat forums, induced discussions on the proper interpretation of the national accounts concepts involved (e.g. how to account for privatisation? and what is the sector General government?) and has accelerated in most Member States the compilation of financial accounts and balance sheets, in particular for the sectors General government. Moreover, several auditing missions have been held.

A stable rate of inflation is another entrance criterion for the European Monetary Union. This has led to the development of an European, harmonised, consumer price index. Such harmonisation was urgently needed, because the concepts and product ranges used by the Member States for their national consumer price indices differed substantially. This work may also induce improvements in the quality and comparability of other price statistics used for compiling the national accounts.

In 1997, the EU-Member States decided to use also figures on the volume growth of GDP for managing and monitoring the European Monetary Union. As a consequence, work has been launched on harmonising and improving the Member States figures on GDP volume growth. The first priority is achieving in a relatively short term (some years) international comparability of these figures. The second more long term priority is to improve the reliability of the figures and the quality of the concepts used to measure volume growth. In 2001, a Handbook was published providing much more operational guidelines for measuring price- and volume changes (Eurostat, 2001). A basic distinction is made between three categories:

- A. Recommended estimation methods ('best practice');
- B. Estimation methods which can be used in case an A-method can not be applied;
- C. Estimation methods which should be avoided.

The handbook is a major contribution to the literature on measuring price- and volume measures in a national accounts context: it gives detailed guidelines by product and transaction-category, incorporates best practice from within the EU and from other experienced countries and provides references to the major articles on the various topics (e.g. about index formulae, the level of aggregation, quality changes and the measurement of the prices of computers and medical services).

In 2000, the EU-Member States decided to develop quarterly accounts for revenue and expenditure of the sector general government. This led also to European definitions of government revenue and expenditure in terms of national accounting concepts. Such definitions are absent in the SNA93, ESA95 and in all earlier national accounts' guidelines.

The European Monetary Union is now the major political project of the EU. The entrance criteria in terms of national accounts figures created a large political interest in these national accounts figures, in particular at the Central Banks and the Ministries of Finance. As a consequence, the national accountant's work on the sector government is now much more actively monitored. In discussing and deciding on the national budget, national accounts statistics on the government deficit have become the central figures in all EU-countries. They have often taken over this role from specifically nationally defined concepts.

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<sup>46</sup> Conceptually and in estimation practice GNP and GDP are very close: GNP is just one extra step, i.e. GNP is GDP plus net primary income flows with the Rest of the World.



#### 4.4 Summary

Under the influence of the international guidelines and the international organisations, national accounts statistics are now available for all countries. For most countries, they have also gradually extended in scope and detail. Nevertheless, still enormous differences in scope, detail, quality and frequency exist between the national accounts statistics published by countries. This applies even to a rather homogeneous block of countries, like the EU.

The introduction of the new guidelines seems to be a great stimulus for many countries to transform their rather simple, SNA53-style, national accounting system into more extended and detailed accounting systems, approaching more the scope and detail of the SNA68 and ESA70. In the next decades only some countries will come near to the scope and detail offered by the most recent guidelines. These guidelines can best be regarded as a menu with some common dishes but where every country can select supplementary dishes according to their own needs and resources.

The guidelines have greatly contributed to the harmonisation of the basic concepts and classifications used by countries. Nevertheless, some differences have continued to exist. Only in the EU, strict compliance to the basic concepts in the international standards is now being enforced.

The ongoing European unification is revolutionising European national accounting. National accounts figures, like GNP, government deficit and GDP volume growth have been selected to play a special role in monitoring and managing the European unification. This role in European policy has also drastically increased the importance of national accounts statistics in national policy. In discussing and deciding on the national budget, national accounts statistics on the government deficit have become the central figures in all EU-countries. They have often taken over this role from specifically nationally defined concepts.

The Member States and the European Commission have been aware that the national accounts statistics did not suffice for such usage. They have therefore launched an ambitious programme for improving the quality and comparability of present national accounts figures and for drastically extending the set of national accounts statistics that are available for all EU-Member States.

From a universal perspective, these European developments are in two respects revolutionary. Firstly, the development of jurisprudence on the interpretation and application of the international guidelines is a totally new development for the national accounts. Secondly, the European experience gives a concrete example of how the quality and comparability of national accounts statistics can be improved.

In order to serve research interests, also unofficial national accounts statistics are being compiled. They usually intend to fill the gaps in the officially published national accounts statistics. Major examples are the historical times series on cross-country economic growth by Maddison (e.g. 2003), the Penn-series on purchasing power-parities (Summers and Heston, 1991) and the classic study by Friedman and Schwartz on the monetary history of the United States. Another group of national accounts statistics are those based on alternative concepts. Major examples are the extended –more welfare oriented accounts- by Eisner (1988) and estimates of economic growth corrected for Douglas North's notion of transactions costs (see Fuess and van den Berg, 1996). A special category are the KLEMs databases on productivity, which combine official and unofficial statistics.



**PART II.**

**THE NATIONAL ACCOUNTS AS A TOOL  
FOR ANALYSIS AND POLICY**

*Logic, relevance and reliability*



## 5. A GENERAL VIEW ON THE NATIONAL ACCOUNTS

In the second part of this book (chapters 5-8), the national accounts as a tool for analysis and policy will be described and discussed. Its major purpose is to reveal the logic, reliability and relevance of official national accounts statistics.

### *National accounts as a barometer or thermometer?*

National economies can not be observed directly, but can only be observed via the national accounts. National accounts statistics make the size, development and composition of these national economies visible by translating them in monetary terms indicating their economic importance. The national accounts is therefore often referred to as the barometer of the national economy.

However, the national accounts is in many respects a much more complex measuring tool. Scheme 5.1 shows that national accounts statistics are – unlike a barometer and a thermometer – not a mechanical and direct translation of events in the real world.

The universal guidelines of the national accounts are the model underlying national accounts statistics all over the world. For thermometers, there seem to be two competing measurement models, i.e. that of Celsius and Fahrenheit. However, they are identical with the exception of the measuring units, because the temperature indicated by Celsius can be simply translated into those by Fahrenheit and vice versa (an example by Stone, 1951b). This contrasts with the universal national accounting model: this selects what is to be measured and how it is to be measured. Without universal national accounting concepts the national economy is not defined and can thus not be measured. Changes in the universal model also change what is measured by national accounts statistics.

The national accounts is also in several other respects different from a barometer, because it interacts with economic theory, with data sources and administrative concepts, with the real world and with the various uses.

### *The universal model and economic theory*

The universal national accounting model is influenced by economic theory in four respects:

1. It can be regarded as a mix of various types of applied economic theory, e.g. accountancy, government finance, balance of payments, input-output tables, index number-theory, monetary analysis and Keynesian analysis.
2. It gives a concrete and specific meaning to concepts used in economic theory, e.g. taxes, economic growth, national income, capital formation, government and government deficit.
3. Economic theory can be used for defining national accounting concepts, e.g. the notion of price discrimination is used for distinguishing between prices and volumes.
4. Economic theory can clarify the relevance of national accounts statistics for various uses, e.g. by demonstrating that Domestic Product should not be regarded as a welfare measure. These insights from economic theory may also influence the design of the universal model. Economic theoretic concepts are designed to be meaningful for economic analysis and decision-making. They can also help to see through the complex, heterogeneous and misty administrative realities.

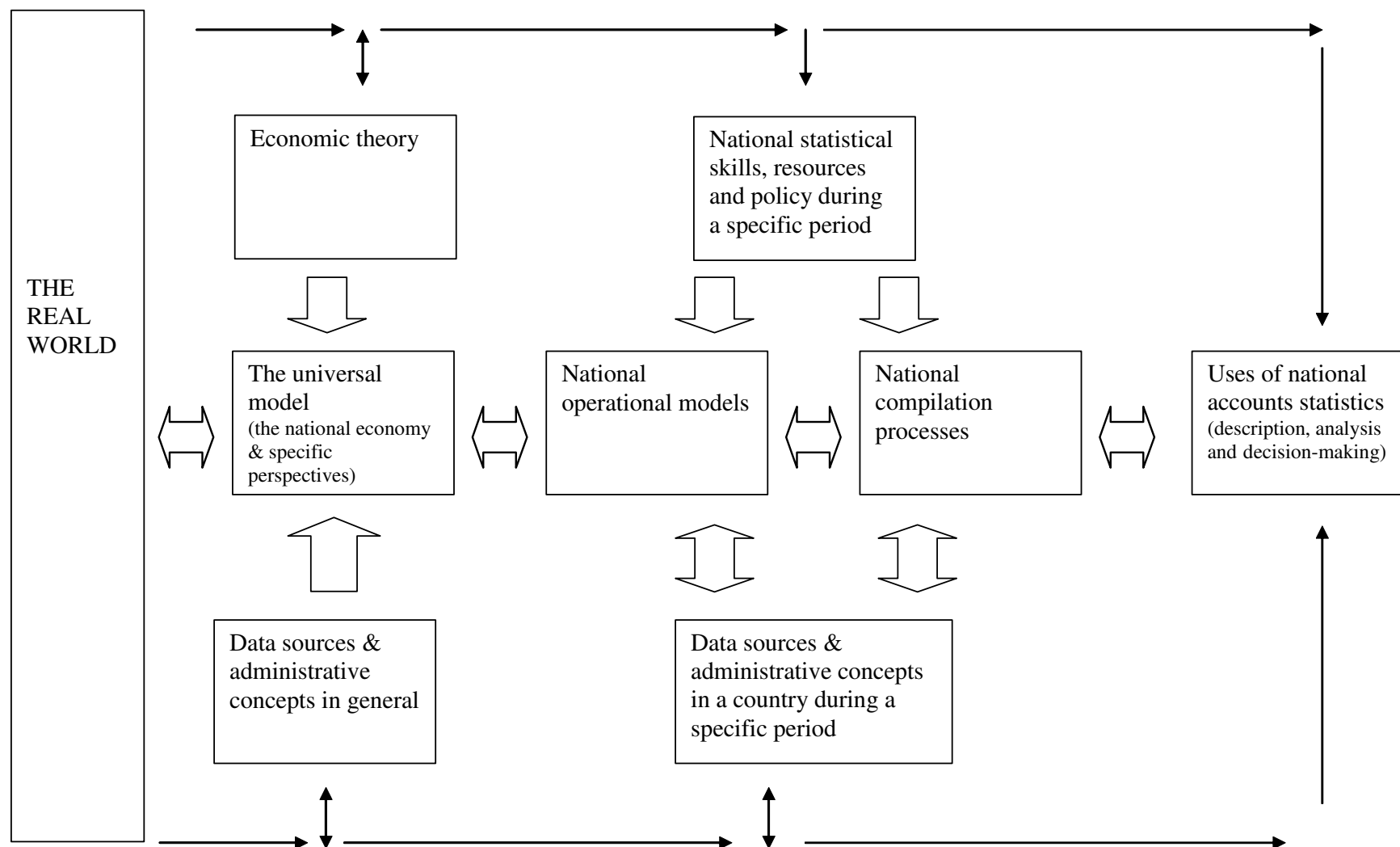
However, economic theoretic concepts may for various reasons also be disregarded by the national accounts, because:

- They may not be suitable for compiling regular statistics; though they may be suited for measurement as a research exercise;
- They can conflict with alternative theoretic concepts;
- They can deviate too much from administrative concepts;
- They can not be reconciled with the ex post accounting logic of national accounts statistics.

*The universal model, data sources and administrative concepts*

The universal model is also influenced by the data sources and administrative concepts. Concepts in national accounts statistics should have a good link to those in administrative data sources, like various tax data (VAT, personal income tax, import levies), business accounts, social security records and data from supervisory boards on banking and insurance, etc. This is essential because they serve often directly or indirectly as inputs for compiling the national accounts statistics. Furthermore, administrative concepts are an important part of economic reality, as they are also the basis for

Scheme 5.1 A general view on the national accounts



decision-making by government, enterprises and households. Therefore, if the national accounts concepts diverge too much from these administrative concepts, they are difficult to understand, difficult to compile and are less likely to meet the data needs for economic analysis and decision-making.

Nevertheless, national accounting concepts usually differ in some respects from the administrative counterparts, because the latter:

- differ between countries, which hampers international compatibility;
- change over time, which hampers comparability over time;
- are usually not consistent with each other. As a consequence, administrative concepts can not be linked and aggregated meaningfully.
- are often not optimal for economic analysis and decision-making.

#### *Interactions between the universal model and the real world*

The universal model is an empirical model. It does not only define what the national economy is, but incorporates also inherent features of current national economies. Put in other words: the universal model is not a random definition of a national economy, but a definition which is selected on being relevant for describing the current national economies. For example, the universal model is in particular designed to describe national economies in which the use of money as a means of exchange, hoarding and accounting plays a dominant role. Similarly, the product-classification in the universal model also reflects the economic importance of the various products in national economies all over the world. As a consequence, important economic and institutional changes can also necessitate changes in the universal model, e.g. the rapidly growing economic importance of new financial derivatives induced their explicit treatment in the new universal model.

The universal model can also influence the real world and the available data sources. This occurs e.g. when government policy is formulated in terms of national accounting concepts or when the business accounts or government accounts in a country are (partly) based on the universal model of the national accounts. Similarly, economic theory may also be affected by national accounts statistics and their concepts, e.g. Keynesian analysis and growth theory were stimulated by the presence of national accounts statistics.

#### *The universal model and the uses of national accounts statistics*

Official national accounts statistics are based on one universal accounting model. This contributes substantially to the quality, stability, neutrality and international comparability of their concepts. It is also essential for describing groups of national economies or showing links between different national economies.

The universal model incorporates two types of perspectives on the national economy. Firstly, it describes the national economy in terms of its major components (groups of actors, various types of flows and stocks and several economic processes). This is the general perspective of the universal model. However, the universal model describes also each major component in a macro-economic context and in relation to the other major components. These are the specific perspectives incorporated in the universal model. Cases in point are the government in the national economy or the role of financial transactions and assets in the national economy.

The history of the national accounts demonstrates that these specific perspectives, and in particular that of the government, are a major motivation for compiling national accounts statistics. For example, King estimated National Income in order to know whether sufficient taxes could be raised in order to finance the war expenditure. Similarly, since the classical article by Stone and Meade (1941), the government budget in many countries is presented in an explicit macro-context, i.e. including statistics and forecasts on the major national accounts



aggregates. So, the national accounts have become a major tool for preparing the government budget.

#### *The national measurement process*

The national measurement process consists of a conceptual part, i.e. the formulation of the operational model, and the actual measurement, i.e. the compilation process. The operational model is formulated on the basis of the universal model, the data sources available and the national skills, resources, policies and demands. The compilation process is the result of measuring the national operational model by applying national skills, resources and policies to the data available nationally.

National accounts statistics are atypical statistics in purpose and method. No other statistic intends to provide a complete picture of the national economy. To this end, national accounts statistics use other statistics, administrative data and qualitative information (e.g. developments reported by branch organisations) as inputs. These very heterogeneous, incomplete, inconsistent, partly outdated and frequently changing data are transformed into one complete, consistent and up-to-date picture of a national economy. Sampling theory and mathematical statistics play only a minor role in this transformation.

Like all statistics outside the textbook-world, national accounts statistics are also influenced by the specific conditions and circumstances of production (skills, resources and policies) and by the specific national demand for data.

The compilation process and the operational model may also influence the available data sources, e.g. when a statistical survey is conducted in order to compile national accounts statistics.

#### *Uses of the national accounts*

National accounts statistics and their underlying model are more than a description of the national economy. Three primary roles can be distinguished:

1. Description and object of analysis, e.g. analysis of economic growth according to national accounts statistics;
2. Tool for analysis and forecasting. This applies for example to an explanation of the volume growth of domestic product in terms of the volume growth of the outputs and inputs of the various industries. Another case in point is an analysis or forecast of the impact of increasing oil prices on producer and consumer prices.
3. Tool for communication and decision-making. For example, wage negotiations and international investments of financial and non-financial capital are influenced by the developments indicated by national accounts statistics. Furthermore, for monitoring and managing the European Monetary Union national accounts statistics like volume growth of domestic product and government deficit as a percentage of National Income are employed.

Official national accounts statistics can also play a secondary role, i.e. serve as input for alternative descriptions and budgetary rules. Examples are an overview of the revenue and expenditure by the government, regional accounts, historical time series including the most recent official statistics, extended accounts, green national income, generational accounts and budgetary expenditure ceilings. Some national accounts statistics are part of official statistics in one country and are alternative descriptions in other countries, because they are compiled in a non-official way (e.g. regional accounts compiled by a research institute) or not presented as part of the regular national accounts statistics. So, the concept of alternative descriptions depend on what is included in the official national accounts statistics of a country. Like official national accounts statistics, alternative descriptions can play three different primary

roles: description and object for analysis, tool for analysis and forecasting and tool for private and public decision-making (see above).

In order to assess the relevance of official national accounts statistics, for each of these roles the merits and limitations should be investigated. This concerns clarifying the absolute merits and limitations, i.e. how relevant and reliable are official national accounts statistics for a specific purpose. To this end also the intended and unintended consequences of using official national accounts statistics for specific purposes should be investigated. However, it covers also revealing the relative merits and limitations, i.e. what are the merits and limitations in view of alternative models (economic theoretic models, administrative models and alternative national accounting models) and alternative data (statistics, administrative data sources and research estimates). This amounts to investigating whether official national accounts statistics are more relevant and reliable for a specific purpose than alternative models and data are.

Assessing merits and limitations indicates the potential relevance of official national accounts statistics. However, national accounts statistics not used at all or not used in a proper way are not very relevant. So, the actual relevance of official national accounts statistics depends also on their actual use and their proper use.

#### *National accounts statistics as an econometric model?*

As a measurement tool, the national accounts has much more in common with econometric models than with barometers. Both national accounts and econometric models have to bridge the gap between economic theory and economic data. Both national accounts and econometric models have witnessed a period of joint development with economic theory and both have become products quite independent from economic theory. A quote about the history of econometric models may illustrate this:

“In the first half of the twentieth century, the econometricians found themselves carrying out a wide range of tasks: from the precise mathematical formulation of economic theories to the development tasks needed to build an econometric model; from the application of statistical methods in data preparation to the measurement and testing of models. Of necessity, econometricians were deeply involved in the creative development of both mathematical economic theory and statistical theory and techniques ... the changing nature of the econometric enterprise in the 1940s caused a return to the division of labour favoured in the late nineteenth century, with mathematical economists working on theory building and econometricians with statistical work. By the 1950s the founding ideal of econometrics, the union of mathematical and statistical economics into a truly synthetic economics, had collapsed” (Morgan, 1990, p. 264).

Both large national accounting systems and large econometric models have a very substantial risk to become incomprehensible, impossible to manage and very cost-inefficient. In modern times, there are therefore strong demands for simple and small models focused on specific issues. This applies to econometric models as well as to national accounts statistics. The major merit of large national accounting systems and large econometric models is that they provide a general overview in which various issues can be linked. Both large national accounting systems and large econometric models should not be driven to extremes, as one giant model can never efficiently and adequately serve all purposes<sup>47</sup>.

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<sup>47</sup> On the merits and limitations of large econometric models, see e.g. Okker (1998).

Compiling national accounts statistics and building econometric models have also much in common, as they both depend to a great extent on skills and tacit knowledge<sup>48</sup>. Building econometric models does not amount to simply following the methods recommended by text books. According to Bodkin, Klein and Marwah (1991, p. 533): “in the present state of the discipline, macro econometric model-building is at least as much of an art as it is a set of scientific procedures”.

This was clearly illustrated by two experiments in the practice of econometrics (Magnus and Morgan, 1998). The first experiment was a field trial experiment: participating teams, with different methodological positions, answer specific economic questions using a given data set. The second experiment was a tacit knowledge experiment: an “apprentice” tries to emulate the approaches of three “master” econometricians on the same applied problem. The two experiments confirmed the findings of other experimental studies of practice and tacit knowledge. Applying econometric methodologies involves a large element of choice and judgement decisions which rely on tacit knowledge rather than on rule following. This can be clarified by the following quote:

“The importance of tacit knowledge can not be appreciated fully by describing it as the ability to make decisions in the absence of written rules. The decision often involve situations where many different aspects of personal knowledge have to work together: methodological and procedural concerns about how to do applied science; econometric knowledge (part statistical, part economics) about how to do applied econometrics; economic theory knowledge (if modelling and interpretation are involved); knowledge of the data or raw material and knowledge of the tools (software, etc.), and so forth. Situations within which practical decisions have to be made are usually extremely complex ... These decisions depend on personal or tacit knowledge (a combination of intellectual knowledge, cognitive skills and more obviously tacit or manual skills), which is partly hidden even to the person who holds the knowledge and thus cannot easily be articulated into rules” (Magnus and Morgan, 1998, p. 378).

Tacit knowledge plays also an important role in the national accounts’ practice. Tacit knowledge is important in defining the operational model and in compiling national accounts statistics. The national accounts’ practices also differ substantially among countries and change over time, e.g. because compilers move to other jobs or because new tools and data become available. Experiments in the national accounting practice may also clarify the role of tacit knowledge in national accounts statistics. For example, ask different teams (from various countries, but also from the same national accounts department) to compile national accounts statistics on the basis of a specific data set.

Also the process of defining and agreeing on the universal model will reflect to a substantial extent tacit knowledge of the persons involved. A major merit of the universal guidelines is that much personal knowledge is translated into publicly available information. The same applies in fact to this thesis: it is an effort to make my personal knowledge explicit and generally accessible.

Large econometric models used for the official forecasts or analyses of the government are part of a political decision-making process in which policy makers and empirical modellers interact (see Den Butter and Morgan, 1998; Boogaard, 1998). The quality of

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<sup>48</sup> On the importance of skills and tacit knowledge for science, see e.g. Collins (1985), Polanyi (1962) and Turner (1994).

forecasts in such a context depends not only on purely statistical criteria. This is illustrated by a quote from the Director of the Dutch CPB:

“Statistical criteria for forecast quality in practice have limited relevance. Three non-statistical criteria for forecast quality are put forward: logical coherence, economic coherence and stability. ... a forecaster must enable his client to form his opinion on the uncertainty associated with the forecast. To this end, uncertainty variants and alternative scenarios appear adequate.” (Don, 2001, p. 155).

National accounts statistics are also part of a political decision-making process<sup>49</sup>. As a consequence, non-statistical criteria of quality, like stability, economic coherence and reputation, are also very important for national accounts statistics.

These non-statistical criteria also reflect technical features of the national accounts, like the overall complexity of national accounts statistics and the non-sampling features of many data sources. Balancing the national accounts in view of all available information is many respects similar to the calibration of an econometric model on the basis of stylised facts<sup>50</sup>. Like for large econometric models, the reliability of national accounts statistics should not only be investigated by purely statistical methods but also by conducting sensitivity analysis like the uncertainty variants and alternative scenarios.

#### *The general view applied*

The more detailed discussions in the subsequent chapters are embedded in this general view on the national accounts. In chapter 6, the universal model underlying all official national accounts statistics (i.e. the prescriptions by the international guidelines) is described and discussed. The national measurement process is the topic of chapter 7. The relevance of national accounts statistics for the four major roles is investigated in chapter 8.

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<sup>49</sup> Econometric models, national accounts and their relationships with politics and society can also be viewed from a wider perspective, i.e. as part of the role of quantification in politics and society. There is a whole literature on this, see e.g. Alonso and Starr (1987), Porter (1995) and Desrosières (1998). A somewhat separate literature exists on accounting, organizations and society, see e.g. Hopwood and Miller (1994).

<sup>50</sup> On calibration of economic and econometric models, see Boumans (2001).

## 6. THE UNIVERSAL MODEL: EIGHT INTERRELATED MODELS

### *Balancing relevance and measurability*

#### 6.1 Introduction

The conceptual framework in the international guidelines serves as the universal model of the national accounts ('the standard national accounts'). It indicates in general terms how national accounts statistics should describe the national economy. It defines which parts fall outside the accounting system (e.g. unpaid household services) and prescribes how to record what is inside (e.g. what is the value of government output and what classifications are to be used). In this chapter the standard national accounts (SNA93 and ESA95) are described and discussed.<sup>51</sup>

#### *Eight perspectives*

National accounts statistics describe the national economy. The major perspective of the national accounts is to describe the national economy as a whole. However, in addition to this general perspective, there are seven important specific perspectives incorporated in the standard national accounts.

The standard national accounts describe the national economy as a set of three interacting economic processes (I. Production, II. Distribution and use of income and III. Accumulation and financing) in which different roles are played by five main groups of economic actors (the institutional sectors Non-financial corporations, Financial corporations, General government and Households<sup>52</sup> plus the Rest of the World). The roles played by these five groups of economic actors are five major specific perspectives.

The different economic processes could also be regarded as major specific perspectives. However, these perspectives overlap to a great extent with that of the four institutional sectors, as different economic processes are dominated by different sectors. For example, the government is the major re-distributor of income and the financial corporations are involved in most financial transactions. Only the perspective of production and generation of income qualifies as being sufficiently distinct. From this perspective, producers should be grouped by industry and not by institutional sector. This perspective is therefore best labelled as the role of industries. All other perspectives with their own data needs can be regarded as the eight perspective. Cases in point are the role of the environment, social protection or regions.

This implies that the eight perspectives of the national accounts are:

1. The national economy as a whole;
2. Non-financial corporations;
3. Financial corporations;
4. Government;
5. Households;
6. Relations with the Rest of the World;
7. Industries;
8. Other perspectives.

These eight perspectives reflect the major groups of data needs.

#### *Structure of the chapter*

In this chapter, the standard national accounts are explained and discussed in view of these eight perspectives. Each section is devoted to one perspective (sections 6.2-6.9). The only

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<sup>51</sup> The international guidelines are being revised. These new (draft) guidelines (SNA08 and ESA09) are discussed in chapter 3 and in the concluding section of this chapter (6.10).

<sup>52</sup> In the international guidelines, Non-profit-institutions serving households, like churches, trade-unions and consumer organisations are a separate sector, as they are fundamentally different in character from households. However, all over the world, the relative size of this sector is very small. For example, in the Netherlands, this sector was in 1998 only responsible for 0.3% of GDP. The sector non-profit-institutions serving households is therefore not given a role as one of the important specific perspectives. In explaining the standard national accounts it is described and discussed as part of the sector Households.

exception is the role of industries. This perspective is embedded in the input-output framework. The role of industries and the input-output framework are therefore the topic of one section. As a consequence, the section on the national economy as a whole does not include the input-output framework.

All sections (/annexes) consist of three subsections:

- Description: this subsection describes the concepts and tables of the standard national accounts. It also contains some supplementary concepts and tables.
- Discussion: this subsection discusses these concepts and tables.
- Summary.

#### *Description and Polderland statistics*

The heart of the descriptive subsection is always a set of national accounts statistics. This puts the concepts in the guidelines in terms of real world-figures and makes it is easier to see what matters and what not. These statistics describe the national economy of the fictitious country Polderland. In terms of structure and income per capita, Polderland is broadly similar to the Dutch economy, but it is about twice as big.

For explaining and discussing the national accounts, Polderland statistics have been preferred to official Dutch national accounts statistics, as they are a much more flexible tool. They can be adjusted for pedagogical reasons and for analytical reasons and can also incorporate statistics on detail or aspects where no official Dutch statistics are available.

The Polderland statistics comply to the concepts and classifications in the new international guidelines. However, the presentation is:

- simpler, e.g. by showing less accounts and less detail;
- shows more explicitly underlying logic, e.g. by emphasising more the distinction between actual and imputed flows.

Furthermore, also many supplementary concepts and tables are included, e.g. tables on prices, volumes and key-ratios per perspective or alternative concepts on income and final consumption. In this way it is clearly demonstrated how each perspective can be better served.

The *terminology* in the Polderland-tables is in most respects that of the international guidelines. However, some adjustments have been made in cases where the official terminology was misleading or just too long. An example of misleading official terminology is the concept 'actual social contributions'. This label is misleading, as it can include substantial amounts of imputations, i.e. property income attributed to holders of pension fund reserves. In several other instances, the official terminology is simply too long. A case in point is the concept 'acquisitions less disposals of non-financial non-produced assets'. We prefer to label this concept 'acquisition of other non-financial assets'. Another example of too lengthy terminology is the balancing item 'changes in net worth due to saving and capital transfers'. We prefer 'saving and capital transfers'.

#### *Discussion*

In the second subsection of each perspective, the standard national accounts are discussed from five different angles:

1. as a model of the real world;
2. as a model as such;
3. as a model in view of economic theory;
4. as a model in view of administrative concepts;
5. as a model for various types of economic analyses, policy and private decision-making.

In this way, the absolute and relative merits and limitations of the standard national accounts can be revealed.

Systematic evaluation of the standard national accounts requires evaluation in view of all data needs and data possibilities. This evaluation can be formalised by defining the utility of the standard national accounts as a function of data needs and data possibilities.

$$U(\text{SNA}) = f(W_{\text{up}}, R_{\text{up}}, M_{\text{up}}, F_{\text{up}}) \quad (1)$$

Equation 1 indicates that the utility of the standard national accounts is a function of:

- the relative importance of the various uses and perspectives ( $W_{up}$ );
- the relevance of the standard national accounting concepts for each use and perspective ( $R_{up}$ );
- the quality of the measurement for each use and perspective ( $M_{up}$ );
- the user-friendliness of the standard national accounts for each use and perspective ( $F_{up}$ ).

The function makes explicit that there can be trade-offs between different data needs and that relatively important data uses should have a bigger say in deciding on specific conventions.

$$\sum W_{up} = 1 \quad (2)$$

Equation 2 indicates that the relative weights of all uses and perspectives add up to 1 (100%).

$$R_{up} (SNA) = g (N_t, SD, ET, A, CP, CO) \quad (3)$$

Equation 3 indicates that the relevance of the standard national accounting concepts for a specific use and perspective depends also on the national circumstances all over the world; these circumstances can change over time ( $N_t$ ). For example, hyper-inflation drastically reduces the relevance of the standard national accounts in current prices.

The relevance of the basic concepts for a specific use can be judged on the basis of five criterions:

1. The relevance of the scope and detail in general (SD);
2. The relevance from an economic theoretic point of view (ET);
3. The relevance from an administrative point of view (A);
4. Comparability (CP); this encompasses both comparability over time and international comparability;
5. Consistency (CO) (about the importance of consistency, see section 6.2.2).

$$M_{up} (SNA) = h (MB_t, C_t, N_t) \quad (4)$$

Equation 4 indicates that the quality of measurement for a specific use and perspective ( $M_{up}$ ) depends on measurability in general ( $MB_t$ ), the costs of measurement in general ( $C_t$ ) and the national circumstances ( $N_t$ ). For example, in some countries a high quality of measurement can be possible at cheap costs, while in other countries even high compilation costs can not help attaining this quality.

Equation 4 implies that two different criterions for evaluating the standard national accounts are added:

6. Measurability;
7. Cost-efficiency.

$$F_{up} (SNA) = i (AC_t, AT_t, FL_t, N_t) \quad (5)$$

Equation 5 states the user-friendliness of the standard national accounts can be defined in terms of three additional criterions:

8. Accessibility ( $AC_t$ );
9. Suitability as an analytical tool ( $AT_t$ ), in particular for conducting simple analyses like bookkeeping type of explanations (see section 8.3);
10. Flexibility to adjust for specific data needs and circumstances ( $FL_t$ ).

The user-friendliness depends also on the specific national circumstances, e.g. because the skills and resources of data users, like that of government officials, differ all over the world.

In this chapter, the ten criterions for the utility of the standard national accounts will be the general frame of reference to evaluate specific conventions and the standard national

accounts as a whole. Our central thesis is that the standard national accounts are in general well designed and well founded, but that there is still considerable room for improvement, in particular by a better link to specific uses and by taking more account of economic theoretic concepts. Systematic biases exist but merely reflect the natural focus of a regular statistic, i.e. a focus on what can be readily measured.

Conclusions about the logic, merits and limitations of the standard national accounts are drawn in section 6.10.1. Proposals for the next SNA are put forward in section 6.10.2.

### *Value added*

This chapter contributes in various ways to current literature and insights on national accounting. Four innovative and distinctive features can be distinguished.

Firstly, an alternative view on the logic of the universal model is put forward. The universal national accounting model is regarded and presented as a synthesis of the general perspective (the national economy as a whole) and seven specific perspectives. This approach contrasts with the way the standard national accounts is presented in the SNA93 and ESA95<sup>53</sup>. For example, in the SNA93 the accounting system is first briefly described for the national economy as a whole. The subsequent chapters then provide a description of the sectors and separate descriptions of the flows and stocks by account and the accounting system as a whole. The approach in this chapter contrasts also with that of the limited number of textbooks on national accounting. These focus fully on the national economy as a whole and discuss only to a very limited extent the corresponding accounting concepts.

Secondly, the concepts are discussed in view of economic theoretic concepts. In the SNA93 and ESA95 only very limited references are made to economic theoretic concepts; there is only one major exception: the treatment of prices and volumes is well grounded in most recent index number theory. Books on national accounting are generally confined to discussing the most basic concepts of product, income and expenditure in view of welfare. A major exception is the recent book by Vanoli (2005).

Thirdly, the discussion of the concepts is embedded in a general view on national accounting. This general view explicitly takes account of the links with economic theoretic concepts, administrative concepts, the consequences for the reliability of national accounts statistics and the relevance for various specific uses. As a consequence, also the important trade-offs between the various requirements are demonstrated and clarified.

Fourthly, many proposals are put forward for improving the standard national accounts. Tables give concrete examples how to better clarify underlying national accounting logic and how to better serve specific data needs. Furthermore, several suggestions are made for improving the basic national accounting concepts. Finally, three satellites are presented in order to demonstrate how the basic national accounting concepts can be adjusted to serve specific data needs.

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<sup>53</sup> However, it does not contrast that much with the new international guidelines (SNA08 and ESA09); this is discussed in section 6.10.



## 6.2 The national economy

### 6.2.1 Description (including supplementary tables)

The national economy as a whole is the major perspective of the national accounts. This perspective does not only cover national totals for each economic process (e.g. Domestic Product), flow (e.g. taxes paid) and stock (e.g. Net worth of the National Economy). It covers also the national totals broken down by sector or industry, e.g. value added, taxes paid and net worth by sector. As a consequence, the national economy is regarded as the total of the economic processes, flows and stocks of five interacting sectors and a large number of industries.

The national economy as such, i.e. without links to the underlying sectors and industries, is described by five tables (6.2a-f): a current account<sup>54</sup>, an accumulation account, a balance sheet, a table on the supply and use of products, a table with prices, volumes and key-ratios and a macro-economic overview table. The relationship with the four domestic sectors and the Rest of the World is shown in the following five tables (6.2g-k). The last three tables (6.2l-n) provide an overview of the redistribution of income and capital.

The national accounts description of the national economy consists in fact of two overlapping frameworks, i.e. the sector accounts and the input-output framework. This section focuses on the sector accounts, as the input-output framework will be discussed in section 6.8.

The sector accounts describe the national economy, its four domestic sectors (non-financial corporations, financial corporations, general government and households) and their relationships with the Rest of the World. These sectors are described and discussed in other sections and in the three annexes to this chapter. This section focuses on the general logic of the sector accounts. A more detailed discussion of the sequence of accounts can be found in section 6.3.

#### *Sequence of accounts*

The sector accounts provide a complete and systematic description of a national economy in terms of a set of inter-linked accounts. Each of these accounts describes an economic sub-process. The eight sub-processes distinguished are subsequently:

1. Production;
2. Generation of income (value added and its components);
3. Allocation of primary income (e.g. property income and compensation of employees);
4. Secondary distribution of income (taxes, social contributions, social benefits in cash and other income transfers in cash);
5. Use of disposable income (final consumption expenditure);
6. Acquisition of non-financial assets and redistribution by capital transfers;
7. Financing;
8. Other changes.

Together they account for all possible changes in stocks, i.e. in non-financial and financial assets and in liabilities.

The balancing items of the accounts represent the net result of each sub-process. These eight net results are:

1. Domestic Product at market prices;
2. Operating surplus/mixed income;
3. National Income;
4. Disposable Income;

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<sup>54</sup> National accounts and business accounts are conventionally presented in the form of t-shaped accounts with uses on the left and resources on the right. A major use of national accounts figures is comparison of the data for several years. However, the traditional t-shaped accounts are not very suitable for presenting data for several years. For example, developments in balancing items can only be understood by looking first at the developments in the resources on the right side, then switching to the uses on the left side and then combining these. We prefer therefore a format which shows both resources and uses (including balancing items) on the same side: resources (R) first and then the uses (U).

5. Saving;
6. Net Lending (Accumulation account);
7. Net Lending (Financial account);
8. Net Other Changes.

Table 6.2a Current account for Polderland

	2007	2008	08/07	08/07
I. Production account				
R Output at basic prices	1369	1430	61	4%
Taxes on products	85	90	5	6%
minus Subsidies on products	-8	-8	0	0%
U Intermediate consumption	712	737	25	4%
Consumption of fixed capital	109	114	5	5%
Value added market prices	625	661	36	6%
II.1.1 Generation of income account				
R Value added at market prices	625	661	36	6%
U Compensation of employees	372	393	21	6%
Taxes on products	85	90	5	6%
Other taxes on production	8	8	0	0%
Subsidies on products	-8	-8	0	0%
Other subsidies on production	-7	-7	0	0%
Operating surplus/mixed income	175	185	10	6%
II.1.2 Allocation of primary income account				
R Operating surplus/mixed income	175	185	10	6%
Compensation of employees	372	392	20	5%
Taxes on products	77	82	5	6%
Other taxes on production	8	8	0	0%
Property incomes receiveable	314	331	17	5%
Interest	181	193	12	7%
dividends (incl. withdrawal from quasi-corp.)	53	55	2	4%
reinvested earnings on direct foreign investment	13	15	2	15%
property income of insurance policy-holders	60	63	3	5%
rent on land and subsoil assets	7	5	-2	-29%
U Subsidies on products	5	6	1	20%
Other subsidies on production	6	6	0	0%
Property incomes payable	296	317	21	7%
Interest	182	192	10	5%
Dividends	44	51	7	16%
reinvested earnings on direct foreign investment	3	6	3	100%
property income of insurance policy-holders	60	63	3	5%
rent on land and subsoil assets	7	5	-2	-29%
Balance of primary incomes	639	669	30	5%

## 6.2a Current account for Polderland (continued)

	2007	2008	08/07	08/07
II.2 Secondary distribution of income account				
R Balance of primary incomes	639	669	30	5%
Current transfers in cash receiveable	598	625	27	5%
social insurance contributions	203	212	9	4%
actual	138	144	6	4%
imputed (incl. supplements)	65	68	3	5%
social insurance benefits in cash	124	126	2	2%
current taxes on income, wealth, etc.	92	95	3	3%
social assistance benefits in cash	21	22	1	5%
other current transfers n.e.c.	158	170	12	8%
U Current transfers in cash payable	605	631	26	4%
social insurance contributions	203	212	9	4%
actual	138	144	6	4%
imputed (incl. supplements)	65	68	3	5%
social insurance benefits in cash	126	128	2	2%
current taxes on income, wealth, etc.	90	93	3	3%
social assistance benefits in cash	21	22	1	5%
other current transfers n.e.c.	165	176	11	7%
Disposable income	632	663	31	5%
II.4 Use of disposable income account				
R Disposable income	632	663	31	5%
U Final consumption expenditure	532	563	31	6%
collective	81	87	6	7%
individual	451	476	25	6%
final cons. exp. by households	362	384	22	6%
social security benefits via market producers	46	48	2	4%
social assistance benefits via market producers	8	8	0	0%
other non-market output	35	36	1	3%
Saving/Current account of ROW	100	100	0	0%

Table 6.2b Accumulation account for Polderland

	2007	2008	08-07	08/07
III.1. Capital account				
A Gross capital formation	158	169	11	7%
minus Consumption of fixed capital	-109	-114	-5	5%
Acquisition of other non-financial assets	0	0	0	
Capital transfers payable	23	20	-3	-13%
capital taxes	2	2	0	0%
investment grants	10	10	0	0%
other capital transfers	11	8	-3	-27%
L Saving/Current account of ROW	100	100	0	0%
Capital transfers receivable	20	17	-3	-15%
capital taxes	2	2	0	0%
investment grants	9	9	0	0%
other capital transfers	9	6	-3	-33%
Net borrowing	-48	-42	6	-13%
III.2 Financial account				
A Net acquisition of financial assets	396	437	41	10%
L Net incurrence of liabilities	348	395	47	14%
Net lending	48	42	-6	-13%
III.3 Other changes in assets account				
A Other changes in non-financial assets	135	162	27	20%
volume changes	-21	-23	-2	10%
nominal holding gains	156	185	29	19%
neutral holding gains	85	29	-56	-66%
non-neutral holding gains	71	156	85	120%
Other changes in financial assets	323	356	33	10%
volume changes	3	4	1	33%
nominal holding gains	320	352	32	10%
neutral holding gains	116	41	-75	-65%
non-neutral holding gains	204	311	107	52%
L Other changes in liabilities	414	463	49	12%
volume changes	1	1	0	0%
nominal holding losses	413	462	49	12%
neutral holding losses	115	43	-72	-63%
non-neutral holding losses	298	419	121	41%
Net other changes in assets	44	55	11	25%

Table 6.2c Balance sheets for Polderland

	2007	2008	08/07	08/07
IV.1 Opening balance sheet				
A Non-financial assets	3905	4089	184	5%
Financial assets	5264	5983	719	14%
L Liabilities	5201	5963	762	15%
Net worth	3968	4109	141	4%
IV.2 Changes in balance sheet				
A Changes in non-financial assets	184	161	-23	-13%
Changes in financial assets	719	793	74	10%
L Changes in liabilities	762	858	96	13%
Changes in net worth	141	96	-45	-32%
IV.3 Closing balance sheet				
A Non-financial assets	4089	4250	161	4%
Financial assets	5983	6776	793	13%
L Liabilities	5963	6821	858	14%
Net worth	4109	4205	96	2%

Table 6.2d Supply and use of goods and services

	2007	2008	08-07	08/07
S Output at basic prices	1369	1430	61	4%
actual market output	1172	1221	49	4%
imputed market output (FISIM&Insurance)	45	48	3	7%
own-account capital formation	6	7	1	17%
for own final consumption	30	31	1	3%
other non-market output	116	123	7	6%
Imports (actual market output)	405	430	25	6%
Taxes on products	85	90	5	6%
minus Subsidies on products	-8	-8	0	0%
Total supply	1851	1942	91	5%
U Intermediate consumption	712	737	25	4%
use of actual market output	1135	1182	47	4%
use of imputed market output (FISIM&insurance)	26	28	2	8%
Final consumption expenditure	532	563	31	6%
use of actual market output	367	389	22	6%
use of imputed market output (insurance)	19	20	1	5%
use of output for own-final consumption	30	31	1	3%
use of other non-market output	116	123	7	6%
Gross capital formation	158	169	11	7%
use of actual market output	152	162	10	7%
own-account capital formation	6	7	1	17%
Exports (actual market output)	449	473	24	5%
Total use	1851	1942	91	5%

Table 6.2e Prices, volumes and key-ratios for Polderland

	2007	2008
Price-changes		
1 Output	2.1%	0.9%
2 Intermediate consumption	2.6%	0.2%
3 Consumption of fixed capital	1.7%	1.7%
4 Value added	2.0%	2.1%
5 Imports	2.6%	1.5%
6 Exports	2.6%	1.2%
7 Capital formation	1.7%	1.7%
8 Final consumption expenditure	2.0%	1.9%
9 Compensation of employees	2.1%	2.6%
10 General price-change of goods and services	2.2%	0.7%
11 Nominal interest rate (long term)	5.2%	4.4%
12 Real interest rate (long term)	3.0%	3.7%
Volumes and purchasing power		
1 Output (% change)	4.4%	3.6%
2 Intermediate consumption (% change)	5.2%	3.7%
3 Consumption of fixed capital	3.1%	2.9%
4 Value added (% change)	3.7%	3.7%
5 Imports	9.0%	7.7%
6 Exports	9.0%	6.4%
7 Capital formation	5.9%	5.2%
8 Final consumption expenditure	2.9%	3.9%
9 Labour (% change)	1.3%	2.6%
10 Labour (abs. change)	0.2	0.3
11 Labour (level, millions)	11.9	12.3
12 Labour, employees (level, millions)	10.35	10.67
13 Labour productivity change	2.3%	1.1%
Keyratios		
1 Output per employee (full-time eq.)	132.2	134.0
2 Value added per employee	60.4	61.9
3 Compensation of employees per employee	35.9	36.8
4 Operating surplus per employee	16.9	17.3

Table 6.2f Macro-economic overview of Polderland in 2008

	2007 Value prices t	2008 Volume- change	2008 Value prices t-1	2008 Price- change	2008 Value prices t
Net Domestic Product at market prices	625	3.8%	649	1.8%	661
=					
<i>Production approach</i>					
Net Domestic product at basic prices	548	3.5%	567	2.1%	579
output at basic prices	1369	3.5%	1417	0.9%	1430
intermediate consumption (minus)	712	3.7%	738	-0.2%	737
consumption of fixed capital					
(minus)	109	2.8%	112	1.7%	114
Transition to market prices	77	6.5%	82	0.0%	82
taxes on products	85	5.9%	90	0.1%	90
subsidies on products (minus)	8	0.0%	8	2.0%	8
=					
<i>Expenditure approach</i>					
Final consumption	532	3.9%	553	5.0%	563
households	362	4.1%	377	1.8%	384
government	170	3.5%	176	1.9%	179
social benefits in kind via market					
producers	54	1.9%	55	1.8%	56
other non-market output	116	4.3%	121	1.7%	123
Capital formation	158	5.1%	166	1.7%	169
government	21	4.8%	22	1.7%	22
other	137	5.8%	145	1.7%	147
Net exports	44	-4.1%	42	1.9%	43
exports	449	6.6%	479	-1.2%	473
imports (minus)	405	7.8%	437	-1.5%	430
Consumption of fixed capital (minus)	109	2.8%	112	1.7%	114
=					
<i>Generation of income approach (by sector)</i>					
Compensation of employees	372	2.6%	382	2.9%	393
government	75	1.8%	76	2.6%	78
other	297	3.0%	306	2.9%	315
Net operating surplus/mixed income	175	6.3%	186	-0.5%	185
government	0		3		0
other	175	4.6%	183	1.1%	185
Taxes on production	93	3.2%	96	2.0%	98
Subsidies on production (minus)	15	0.0%	15	0.1%	15
=					
<i>Industry-approach</i>					
Domestic product at basic prices	548	3.5%	567	2.1%	579
goods producers	177	4.5%	185	-1.6%	182
trade & transport producers	128	2.3%	131	2.3%	134
financial & business services					
producers	136	5.1%	143	5.6%	151
social & personal services producers	127	1.6%	129	3.9%	134
FISIM-correction at the national					
level	-20	5.0%	-21	4.8%	-22
Transition to market prices	77	6.5%	82	0.0%	82

Table 6.2f Macro-economic overview of Polderland in 2008 (continued)

	2007 Value prices t	2008 Volume- change	2008 Value prices t-1	2008 Price- change	2008 Value prices t
NNI	639	2.8%	657	1.8%	669
=					
NDP at market prices	625	3.8%	649	1.8%	661
Net primary incomes with the ROW	14	-43.8%	8	1.7%	8
Taxes on production paid to ROW					
(minus)	8	-1.8%	8	1.8%	8
Subsidies received from ROW	4	-26.4%	3	1.8%	3
Net compensation of employees with ROW	0		-1	1.8%	-1
receivable	1	-1.6%	1	1.8%	1
payable	1	96.7%	2	1.8%	2
Net property income with the ROW	18	-23.5%	14	1.8%	14
receivable	80	5.7%	85	1.8%	86
payable	62	14.0%	71	1.8%	72
Trading gain changes in terms of trade			0		
net exports deflated by prices final expenditure			42		
net exports deflated by import&export prices			42		
Current external balance	51	-13.3%	44	1.8%	45
=					
Net exports (deflated by import&export prices)	44	-4.1%	42	1.9%	43
Trading gain from changes in terms of trade			0		
Net primary incomes with the ROW	14	-43.8%	8	1.7%	8
Net income transfers with Rest of the World	-7	-15.8%	-6	1.8%	-6
receivable	7	12.3%	8	1.8%	8
payable	14	-1.8%	14	1.8%	14



Table 6.2g Current account for Polderland in 2008

Current resources (R) and current uses (U)		Sectors						
		NFC	FC	GG	HH	NE	ROW	Total
I. Production account								
R	Output at basic prices (/Imports)	1004	70	147	209	1430	430	1860
	Taxes on products					90		90
	minus Subsidies on products					-8		-8
U	Intermediate consumption (/Exports)	557	29	49	80	737	473	1210
	Consumption of fixed capital	66	5	20	23	114		114
	Value added basic pr./market pr.)	381	36	78	106	661		
II.1.1 Generation of income account								
R	Value added at basic prices (/market pr.)	381	36	78	106	661		
U	Compensation of employees	265	22	78	28	393	1	394
	Taxes on products					90		90
	Other taxes on production	4	1	1	2	8		8
	Subsidies on products					-8		-8
	Other subsidies on production	-5	0	-1	-1	-7		-7
	Operating surplus/mixed income	117	13	0	77	185		
II.1.2 Allocation of primary income account								
R	Operating surplus/mixed income	117	13	0	77	185		
	Compensation of employees				392	392	2	394
	Taxes on products			82		82	8	90
	Other taxes on production			8		8	0	8
	Property incomes receiveable	38	159	17	95	331	72	403
	interest	14	156	6	17	193	47	240
	correction for FISIM		-22			0		
	dividends (incl. withdrawal from quasi-corp.)	15	19	6	15	55	19	74
	reinvested earnings on direct foreign investment	9	6			15	6	21
	property income of insurance policy-holders				63	63	0	63
	rent on land and subsoil assets	0	0	5	0	5		5
U	Subsidies on products			6		6	2	8
	Other subsidies on production			6		6	1	7
	Property incomes payable	85	154	38	40	317	86	403
	interest	40	75	38	39	192	48	240
	dividends	36	15			51	23	74
	reinvested earnings on direct foreign investment	5	1			6	15	21
	property income of insurance policy-holders		63			63	0	63
	rent on land and subsoil assets	4	0	0	1	5		5
	Balance of primary incomes	70	18	57	524	669		

## 6.2g Current account for Polderland in 2008 (continued)

Current resources (R) and current uses (U)		Sectors						
		NFC	FC	GG	HH	NE	ROW	Total
II.2 Secondary distribution of income account								
R	Balance of primary incomes	70	18	57	524	669		
	Current transfers in cash receiveable	16	100	332	177	625	14	639
	social insurance contributions	10	74	127	1	212		212
	actual	0	26	118	0	144		144
	imputed (incl. supplements)	10	48	9	1	68		68
	social insurance benefits in cash				126	126	2	128
	current taxes on income, wealth, etc.			95		95	0	95
	social assistance benefits in cash				22	22	0	22
	other current transfers n.e.c.	6	26	110	28	170	12	182
U	Current transfers in cash payable	46	68	217	300	631	8	639
	social insurance contributions				212	212		212
	actual				144	144		144
	imputed (incl. supplements)				68	68		68
	social insurance benefits in cash	11	37	79	1	128		128
	current taxes on income, wealth, etc.	29	5	0	59	93	2	95
	social assistance benefits in cash			22		22		22
	other current transfers n.e.c.	6	26	116	28	176	6	182
	Disposable income	40	50	172	401	663		
II.4 Use of disposable income account								
R	Disposable income	40	50	172	401	663		
	Correction for pension fund reserves		-37		37	0	0	0
U	Final consumption expenditure			179	384	563		563
	collective			87		87		87
	individual			92	384	476		476
	final cons. exp. by households				384	384		
	social security benefits via market producers			48		48		
	social assistance benefits via market producers			8		8		
	other non-market output			36		36		
	Saving/Current account of ROW	40	13	-7	54	100	-45	55

Table 6.2h Accumulation account for Polderland in 2008

Changes in assets (A) and changes in liabilities (L)		Sectors						
		NFC	FC	GG	HH	NE	ROW	Total
III.1. Capital account								
A	Gross capital formation	89	8	22	50	169		169
	minus Consumption of fixed capital	-66	-5	-20	-23	-114		-114
	Acquisition of other non-financ. assets	2	0	-4	2	0	0	0
	Capital transfers payable	0	0	13	7	20	2	22
	capital taxes				2	2		2
	investment grants			10		10	0	10
	other capital transfers	0		3	5	8	2	10
L	Saving/Current account of ROW	40	13	-7	54	100	-45	55
	Capital transfers receivable	2	2	10	3	17	5	22
	capital taxes			2		2		2
	investment grants	3	0	6	0	9	1	10
	other capital transfers	-1	2	2	3	6	4	10
	Net borrowing	-17	-12	8	-21	-42	42	0
III.2 Financial account								
A	Net acquisition of financial assets	87	292	-34	92	437	246	683
L	Net incurrence of liabilities	70	280	-26	71	395	288	683
	Net lending	17	12	-8	21	42	-42	0
III.3 Other changes in assets account								
A	Other changes in non-financial assets	15	2	11	134	162		
	volume changes	-7	0	-2	-14	-23		
	nominal holding gains	22	2	13	148	185		
	neutral holding gains	9	1	6	13	29		
	non-neutral holding gains	13	1	7	135	156		
	Other changes in financial assets	29	159	2	166	356	170	526
	volume changes	1	2	-1	2	4	-1	3
	nominal holding gains	28	157	3	164	352	171	523
	neutral holding gains	4	22	1	14	41	10	51
	non-neutral holding gains	24	135	2	150	311	161	472
L	Other changes in liabilities	268	195	2	-2	463	63	526
	volume changes	2	1	1	-3	1	2	3
	nominal holding gains	266	194	1	1	462	61	523
	neutral holding gains	13	22	4	4	43	10	53
	non-neutral holding gains	253	172	-3	-3	419	51	470
	Net other changes in assets	-224	-34	11	302	55	107	

Table 6.2i Balance sheets for Polderland in 2008

Assets (A) and liabilities (L)		Sectors						
		NFC	FC	GG	HH	NE	ROW	Total
IV.1 Opening balance sheet								
A	Non-financial assets	1266	109	788	1926	4089		
	Financial assets	635	3108	187	2053	5983	1433	7416
L	Liabilities	1680	3184	558	541	5963	1453	7416
	Net worth	221	33	417	3438	4109	-20	
IV.2 Changes in balance sheet								
A	Changes in non-financial assets	10	1	-13	163	161		
	Changes in financial assets	116	451	-32	258	793	416	1209
L	Changes in liabilities	338	475	-24	69	858	351	1209
	Changes in net worth	-212	-23	-21	352	96	65	
IV.3 Closing balance sheet								
A	Non-financial assets	1276	110	775	2089	4250		
	Financial assets	751	3559	155	2311	6776	1849	8625
L	Liabilities	2018	3659	534	610	6821	1804	8625
	Net worth	9	10	396	3790	4205	45	

Table 6.2j The supply and use of goods and services in Polderland 2008

Resources (R) and uses (U)		Sectors						Total
		NFC	FC	GG	HH	NE	ROW	
R	Output at basic prices	1004	70	147	209	1430		1430
	actual market output	1000	22	23	176	1221		1221
	imputed market output (FISIM&Insurance)	0	48	0	0	48	0	48
	own-account capital formation	4	0	1	2	7		7
	fow own final consumption				31	31		31
	other non-market output	0	0	123	0	123	0	123
	Imports (actual market output)						430	430
	Taxes on products					90		90
	minus Subsidies on products					-8		-8
U	Intermediate consumption	557	29	49	80	737		737
	use of actual market output	554	28	48	79	709		1182
	use of imputed market output	3	1	1	1	28	0	28
	Final consumption expenditure			179	384	563		563
	use of actual market output			56	333	389		389
	social security benefits in kind			48				
	social assistance benefits in kind			8				
	other				333			
	use of imputed market output (insurance)				20	20		20
	use of output for own-final consumption				31	31		31
	use of other non-market output			123		123		123
	collective			87				
	individual			36				
	Gross capital formation	89	8	22	50	169		169
	use of actual market output	85	8	21	48	162		162
	own-account capital formation	4	0	1	2	7		7
	Exports (actual market output)						473	473
	P.M. Total resources (= supply of products)							1942
	Total use (= use of products)							1942

Table 6.2k Prices, volumes and key-ratios for Polderland in 2008

		Sectors						
		NFC	FC	GG	HH	NE	ROW	Total
Price-changes								
1	Output	0.5%	3.0%	1.9%	1.8%	0.9%		
2	Intermediate consumption	-0.6%	2.0%	1.6%	0.8%	-0.2%		
3	Consumption of fixed capital	1.7%	1.7%	1.6%	1.7%	1.7%		
4	Value added	1.6%	6.9%	2.0%	3.1%	2.1%		
5	Imports					-1.5%		
6	Exports					-1.2%		
7	Capital formation	1.7%	1.7%	1.6%	1.7%	1.7%		
8	Final consumption expenditure			2.3%	1.8%	1.9%		
9	Compensation of employees (contractual price per full-time eq.)					2.6%		
10	General price-change of goods and services					0.7%		
11	Nominal interest rate (long term)					4.4%		
12	Real interest rate (long term)					3.7%		
Volumes and purchasing power								
1	Output (% change)	4.0%	5.6%	2.4%	1.7%	3.6%		
2	Intermediate consumption (% change)	4.6%	8.0%	-1.6%	4.6%	3.7%		
3	Consumption of fixed capital	3.1%	-1.7%	3.7%	2.8%	2.9%		
4	Value added (% change)	3.9%	2.2%	2.0%	4.0%	3.7%		
5	Imports					7.7%		
6	Exports					6.4%		
7	Capital formation	6.8%	12.6%	3.2%	2.5%	5.2%		
8	Final consumption expenditure			3.3%	4.1%	3.9%		
9	Labour (% change)	3.2%	5.0%	1.8%	1.1%	2.6%		
10	Labour (abs. change)	0.24	0.02	0.03	0.03	0.3202		
11	Labour (level, millions)	7.44	0.42	1.93	2.47	12.256		
12	Labour, employees (level, millions)	7.44	0.42	1.93	0.89	10.675		
Keyratios								
1	Output per employee (full-time eq.)	135.0	165.3	76.3	234.9	134.0		
2	Value added per employee	51.2	85.0	40.5	119.2	61.9		
3	Compensation of employees per employee	35.6	51.9	40.5	31.5	36.8		
4	Operating surplus per employee	15.7	30.7	0.0	86.6	17.3		
5	Relative size in Domestic employment	61%	3%	16%	20%	100%		
6	Relative size in Domestic Product	58%	5%	12%	16%	100%		
7	Relative size in National Net worth beginning	5%	1%	10%	84%	100%		
8	Relative size in National Net worth end	0%	0%	9%	90%	100%		

Table 6.2I Redistribution of income by insurance (supplementary table)

Resources (R) and uses (U)		Sectors						Total
		NFC	FC	GG	HH	NE	ROW	
R	Social insurance contributions	10	74	127	1	212	0	212
	social security contributions			118		118	0	118
	pension contributions		72			72	0	72
	actual		23			23	0	23
	supplements		49			49	0	49
	other private social contributions	10	2	9	1	22	0	22
	actual		2			2	0	2
	imputed employers' social contributions	10	0	9	1	20	0	20
	Casualty insurance premiums		25			25	0	25
	actual		23			23	0	23
	supplements		2			2	0	2
	Social insurance benefits				174	174	2	176
	social security benefits in cash				69	69	1	70
	social security benefits in kind				48	48	0	48
	pension benefits				35	35	1	36
	other private social benefits				22	22	0	22
	Correction for pension fund reserves		-37		37	0	0	0
	Casualty insurance claims	4	2	0	19	25	0	25
U	Social insurance contributions	0	0	0	212	212	0	212
	social security contributions				118	118	0	118
	pension contributions				72	72	0	72
	other private social contributions				22	22	0	22
	Casualty insurance premiums	4	1	0	20	25	0	25
	Social insurance benefits	11	37	127	1	176	0	176
	social security benefits in cash			70		70	0	70
	social security benefits in kind			48		48	0	48
	pension benefits		35			35	0	35
	other private social benefits	11	2	9	1	23	0	23
	Casualty insurance claims		25			25	0	25
	Redistribution by insurance	-1	1	0	-2	-2	2	0
	in cash	-1	1	48	-50	-2	2	0
	in kind	0	0	-48	48	0	0	0

Table 6.2m Other redistribution of income (supplementary table)

Resources (R) and uses (U)		Sectors						
		NFC	FC	GG	HH	NE	ROW	Total
R	Current taxes on income, wealth etc.	0	0	95	0	95	0	95
	Transfers within general government			106		106		106
	Transfers by the government to the R.O.W.					0	8	8
	Social assistance benefits in cash				22	22		22
	Social assistance benefits in kind				8	8		8
	Transfers of individual other non-market output				36	36		36
	Other current transfers n.e.c.	2	-1	4	9	14	4	18
U	Current taxes on income, wealth etc.	29	5	0	59	93	2	95
	Transfers within general government			106		106		106
	Transfers by the government to the R.O.W.			8		8		8
	Social assistance benefits in cash			22		22		22
	Social assistance benefits in kind			8		8		8
	Transfers of individual other non-market output			36		36		36
	Other current transfers n.e.c.	2	0	2	8	12	6	18
	Other redistribution of income	-29	-6	23	8	-4	4	0
	in cash	-29	-6	67	-36	-4	4	0
	in kind	0	0	-44	44	0	0	0

Table 6.2n Overview on the redistribution of income and capital (supplementary table)

Resources (R) and uses (U)		Sectors						
		NFC	FC	GG	HH	NE	ROW	Total
	Balance of primary income	70	18	57	524	669	0	0
	Redistribution of income in cash	-30	-5	115	-86	-6	6	0
	Redistribution by insurance in cash	-1	1	48	-50	-2	2	0
	Other redistribution in cash	-29	-6	67	-36	-4	4	0
	Disposable income (incl. corr.pens.reserves)	40	13	172	438	663	6	0
	Redistribution of income in kind	0	0	-92	92	0	0	0
	Redistribution by insurance in kind	0	0	-48	48	0	0	0
	Other redistribution in kind	0	0	-44	44	0	0	0
	Adjusted disposable income (incl. corr.)	40	13	80	530	663	6	0
	Redistribution of capital	2	2	-3	-4	-3	3	0
	Capital transfers receiveable	2	2	10	3	17	5	22
	Capital transfers payable	0	0	13	7	20	2	22
	Fully adjusted disposable income	42	15	77	526	660	9	0
	Total redistribution	-28	-3	20	2	-9	9	0



The non-financial accounts, i.e. the accounts from production unto accumulation, are inter-linked via their balancing items. The balancing item is the difference between the resources and uses of the account and is shown as a use. It is also the first resource in the next account. For example, value added is the balancing item of the Production Account (a use), which is also the first resource in the Generation of Income account. The balancing item of this account is operating surplus, which is also the first resource of the Allocation of primary Income account.

By starting each non-financial account with the balancing item of the previous account, *the balancing item of each non-financial account becomes the balancing item of all previous non-financial accounts*. For example, Disposable Income is the balancing item of the Secondary Distribution of Income Account, but also of the Production Account, the Generation of Income Account, the Allocation of Primary Income Account and the Secondary Distribution of Income Account taken together. This implies that the balancing item of the last non-financial account, i.e. Net Lending, can also be interpreted as the balancing item of all non-financial transactions.

The sector accounts describe flows and stocks for each sector and for the national economy as a whole. However, they do not describe simultaneously the receiving and paying sectors for (groups of) specific flows and stocks.

Complementary tables that show also this sector-by-sector point of view are very important for both analysis<sup>55</sup> and compiling good-quality national accounts figures. This applies in particular to sector-by-sector tables on taxes (who is paying the various types of taxes?), subsidies, property income (e.g. interest and dividend), other income and capital transfers, financial transactions (flow-of-funds tables, see Annex 6.A), holding gains/losses, financial assets and liabilities.

### *Identities and other relationships*

The sector accounts are a strong and systematic description of a national economy. As such they impose and exploit many identities and relationships. We can distinguish three types of identities:

- those that are relevant for each actor, sector and the national economy (in current prices);
- those that apply to the national economy as a whole (in current prices);
- those that pertain to values, prices and volumes.

Furthermore, various other relationships are embedded in the accounting framework.

### *Identities for each actor, sector and the national economy*

$$S_{nf} + S_{fa} = S_{fl} + S_{nw} \quad (1)$$

This first identity is the *identity of the balance sheet*<sup>56</sup> (see e.g. table 6.2c): the stock of non-financial assets ( $S_{nf}$ ) plus the stock of financial assets ( $S_{fa}$ ) is equal to the liabilities ( $S_{fl}$ ) plus the balancing item net worth ( $S_{nw}$ ). This identity reflects that the national accounts are a *double-entry* bookkeeping system like the business accounts<sup>57</sup>. In order to maintain the identity of the balance sheet, changes in assets (uses) are to be matched by changes in liabilities (resources). For example, the sale of a good held in stock for cash reduces the stock of non-financial assets and increases the financial assets. When the increase in financial assets exceeds the reduction of the non-financial assets this difference is recorded as a change in net worth.

<sup>55</sup> They stress interactions between sectors, which is very important for modelling the national economy.

<sup>56</sup> The identity between uses and resources is sometimes referred to as the budget restriction (e.g. in the international course on national accounting by Statistics Netherlands). This identity is in fact the direct consequence of the balance sheet identity.

<sup>57</sup> A common misunderstanding is that double-entry bookkeeping system amounts to two accounting entries for each transaction (one resource and one use/one debit and one credit). However, transactions can be very complex (e.g. with trade credit) involving many entries in the bookkeeping system of one firm. The basic principle is therefore that the entries ensure that the balance sheet identity is maintained.

$$S = \sum S_a \quad (2)$$

This second identity shows that the total of stocks (S) is equal to the sum of the stocks by type, i.e. the stocks are classified in an exhaustive and non-overlapping way. This applies to non-financial assets, financial assets and liabilities.

$$F = \sum F_b \quad (3)$$

The third identity shows that the total of flows (F) is equal to the sum of the flows by type, i.e. the flows are classified in an exhaustive and non-overlapping way.

$$\Delta S = F \quad (4)$$

This fourth identity indicates that the changes in stocks (S) are equal to flows (F).

$$F = T + O \quad (5)$$

This fifth identity indicates that the flows can be broken down into transactions (T) and other changes in assets (O), i.e. holding gains and losses and other changes in the volume of assets.

$$\Delta S_f = T_f + O_f \quad (6)$$

This sixth identity shows that the change in financial assets ( $\Delta S_f$ ) is equal to the net total of financial transactions ( $T_f$ ) plus the other changes in financial assets ( $O_f$ ). A similar identity holds for the non-financial assets ( $S_{nf}$ ) and for each individual type of asset ( $S_a$ ).

$$\Delta NW = T_{nf} - T_{nf,snf} + O \quad (7)$$

According to identity 7, the change in net worth ( $\Delta NW$ ) is equal to the net total of non-financial transactions ( $T_{nf}$ ) minus the acquisition of non-financial assets ( $T_{nf,snf}$ ) plus the other changes in assets. The acquisition of non-financial assets consists of the non-financial transactions capital formation and the acquisition of other non-financial assets (e.g. land). The acquisition of non-financial assets should be excluded, because they do not change net worth but change only the composition of the assets and liabilities. In terms of balancing items, the net total of non-financial transactions minus the non-financial transactions is equal to saving plus capital transfers.

$$T_f = T_{nf} \quad (8)$$

The net balance of all non-financial transactions ( $T_f$ ) recorded as resources or uses is net lending (borrowing). Identity 8 shows that net lending should also be equal to the net total of financial transactions ( $T_{nf}$ ). This implies that net lending can be estimated in two basic ways, i.e. by estimating the net balance of all non-financial transactions or by estimating the net balance of all financial transactions. This can also be expressed in terms of the standard accounting structure (see e.g. table 6.2b): the balancing item of the capital account and that of the financial accounts is net lending (borrowing).

$$T_f = T_{nf} = R - E \quad (9)$$

Some of the non-financial transactions are recorded more than once, e.g. expenditure on own-account capital formation is recorded three times:

- as production costs (e.g. compensation of employees);
- as output valued at production costs;
- as capital formation.

Resources and uses netted for such repeated entries could be labelled as revenue (R) and expenditure (E). Also the net balance of the revenue and expenditure should be equal to the net total of financial transactions (equation 9). This is demonstrated by table 6.5d on the revenue and expenditure of the government.

$$T_p = r * S_f \quad (10)$$

Identity 10 shows that there is a link between the property incomes ( $T_p$ , part of the non-financial transactions  $T_{nf}$ ) and the financial assets ( $S_f$ ): the property incomes, like interest and dividend, can be regarded as the rate of return ( $r$ ) on (the average stock of) financial assets, like loans and equity stock.

$$P = IC + CC + W + V_{tnp} - V_{snp} + OS \quad (11)$$

One of the non-financial transactions is production (P). Production is valued at basic prices<sup>58</sup> and can be broken down by type of production cost, i.e. intermediate consumption (IC), capital consumption (CC), compensation of employees (W), other taxes on production ( $V_{tnp}$ ), other subsidies on production (minus,  $V_{snp}$ ) and operating surplus<sup>59</sup> (OS); the operating surplus acts as balancing item (identity 11).

$$VA = P - IC - CC \quad (12)$$

Net value added at basic prices (VA) is the income generated by the production process (see the production account in table 6.2a). It is defined as the value of production (P) minus the goods and services used up, i.e. intermediate consumption (IC) and capital consumption (CC) (identity 12). It is the balancing item of the production account.

$$VA = W + V_{tnp} - V_{snp} + OS \quad (13)$$

Identity 13 (see also the generation of income account in table 6.2a) implies that net value added at basic prices (VA) is equal to the sum of compensation of employees (W), other taxes on production ( $V_{tnp}$ ), other subsidies on production (minus,  $V_{snp}$ ) and operating surplus (OS)<sup>60</sup>. Gross value added could be obtained by adding capital consumption.

The other balancing items, like disposable income and saving, can also be expressed as identities. The identities can easily be derived from the accounting structure (see table 6.2a, b and c).

*Identities for the national economy as a whole*

$$S_{ne} = \sum S_i = S_{nfc} + S_{fc} + S_{gg} + S_{hh} \quad (14)$$

<sup>58</sup> The basic price is the price receivable by the producers from the purchaser for a unit of a good or service produced as output minus any tax payable on that unit as a consequence of its production or sale (tax on products) plus any subsidy receivable on that unit as a consequence of its production or sale (subsidy on products). It excludes any transport charges invoiced separately by the producer.

<sup>59</sup> Or mixed income.

<sup>60</sup> Value added at factor costs is not an official universal concept anymore. It is equal to value added at basic prices plus the taxes on products minus the subsidies on products.

Identity 14 indicates that the stocks of the national economy ( $S_{ne}$ ) are equal to the sum of the stocks of the various sectors, i.e. non-financial corporations ( $S_{nfc}$ ), financial corporations ( $S_{fc}$ ), general government ( $S_{gg}$ ) and households ( $S_{hh}$ ). This identity is shown in the first five columns of the balance sheet in table 6.2i.

$$F_{ne} = \sum F_i = F_{nfc} + F_{fc} + F_{gg} + F_{hh} + F_{nec} \quad (15)$$

A similar identity holds for the flows (identity 15; see the first five columns in the current and capital account in tables 6.2g and h). However, not all flows pertain to a specific sector. As a consequence, the flows of the national economy ( $F_{ne}$ ) are equal to the sum of the flows of the various sectors plus some unallocated flows ( $F_{nec}$ ). The major examples of such unallocated flows are taxes on products paid and taxes on subsidies received (see the production account in table 6.2g).

$$T_{gh} = T_{hg} \quad (16)$$

The national accounts are a *quadruple entry-bookkeeping system*. This implies that – in addition to the identity of the balance sheet- also the identity for transactions between units is applied, i.e. transactions ( $T$ ) between two actors (/sectors) are recorded in the accounts of both actors ( $g$  &  $h$ ) (identity 16). For example, compensation of employees is recorded in the accounts of the employer and in the accounts of the employee. This identity applies to financial and non-financial transactions alike.

$$S_{fa,gh} = S_{fl,hg} \quad (17)$$

A similar identity holds for financial assets ( $S_f$ ), e.g. a loan is a liability for one actor ( $S_{fl}$ ) and a financial asset for the other ( $S_{fa}$ ) (identity 17).

$$\sum T_{b,gh} = \sum T_{b,hg} \quad (18)$$

As a consequence of identity 17, also the total resources of each type of transaction ( $\sum T_{b,gh}$ ) are equal to the total uses of the same transaction ( $\sum T_{b,hg}$ ). This identity is shown in the last column of the current and accumulation account in tables 6.2g and 6.2h. For example, the total compensation of employees received by the domestic sectors and the rest of the world (394; resources in the allocation of primary income account) are equal to the total compensation of employees paid by the domestic sectors and the rest of the world (394; uses in the generation of income account). Similarly, the total current transfers in cash receivable (639; the last column at the resources side of the secondary distribution of income account) is equal to the total current transfers in cash payable (639; the last column at the uses side of the secondary distribution of income account).

$$\sum S_{fa,gh} = \sum S_{fl,hg} \quad (19)$$

As a consequence of identity 17, also the total financial assets by type ( $\sum S_{fa,gh}$ ) are equal to the total liabilities by type ( $\sum S_{fl,hg}$ ). This is shown in the last column of the balance sheet in table 6.2i, e.g. opening balance sheet: total financial assets = 7416 = total liabilities.

$$\sum T_{gs,gh} = \sum T_{gs,hg} \quad (20)$$

A special category of transactions are the *transactions in products*, because they are the only type of transaction recorded in more than two different accounts. Identity 20 shows that the

supply of goods and services ( $\sum T_{gs,gh}$ ) is equal to the use of goods and services ( $\sum T_{gs,hg}$ ).

$$\sum T_{gs,hg} = IC_{ne} + CF_{ne} + FC_{ne} + E_{ne} \quad (21)$$

The use of goods and services consist of intermediate consumption ( $IC_{ne}$ ), capital formation ( $CF_{ne}$ ), final consumption expenditure ( $FC_{ne}$ ) and exports ( $E_{ne}$ ) by the national economy (identity 21). These uses are all valued at purchasers' prices, i.e. the price the purchaser actually pays for the products, e.g. including any taxes on products but excluding deductible taxes like VAT on the products.

$$\sum T_{gs,gh} = P_{ne} + I_{ne} + V_{ttm,ne} + V_{tp,ne} - V_{sp,ne} \quad (22)$$

According to identity 22, the supply of goods and services can be decomposed into production by the national economy ( $P_{ne}$ ) and imports ( $I_{ne}$ ). Production and imports are valued at basic prices. In order to establish the identity between the supply and use of goods and services, the supply of goods and services at basic prices should be transformed into the supply at purchasers' prices. This requires three types of corrections:

1. The trade and transport margins ( $V_{ttm}$ ) should be added when the output is broken down by product. However, for the national economy the trade and transport margins to be added to the goods at basic prices cancel out with the trade and transport margins to be deducted from the services. This implies that the trade and transport margins for the national economy as a whole ( $V_{ttm,ne}$ ) are by definition nil and can be ignored.
2. The taxes on products are to be added ( $V_{tp,ne}$ );
3. The subsidies on products are to be deducted ( $V_{sp,ne}$ ).

$$P_{ne} + I_{ne} + (V_{ttm,ne} + V_{tp,ne} - V_{sp,ne}) = IC_{ne} + CF_{ne} + FC_{ne} + E_{ne} \quad (23)$$

Identities 21 and 22 imply that production plus imports plus corrections for differences in valuation (= total supply at purchasers' prices) is equal to intermediate consumption plus capital formation plus final consumption expenditure and exports (= total use of goods and services at purchasers' prices) (identity 23). This identity holds for the national economy and for each product. This is elaborated in Annex 6B. For the national economy this identity is also shown in tables 6.2d and 6.2j.

$$VA_{ne,mp} = P_{ne} - IC_{ne} - CC_{ne} + V_{tp,ne} - V_{sp,ne} \quad (24)$$

According to identity 11 net value added of the national economy at basic prices ( $VA_{ne,bp}$ ) is equal to production of the national economy ( $P_{ne}$ ) minus intermediate consumption ( $IC_{ne}$ ) minus capital consumption ( $CC_{ne}$ ). However, for the national economy preference is given to net value added at market prices, i.e. Net Domestic Product at market prices. In order to obtain Net Domestic Product at market prices in addition taxes on products ( $V_{tp,ne}$ ) should be added, while subsidies on products ( $V_{sp,ne}$ ) should be deducted<sup>61</sup>. The way identity 24 defines Domestic Product corresponds to *the production approach* to estimating Domestic Product. This identity is explicitly shown in the macro-economic overview table (table 6.2f).

<sup>61</sup> Domestic Product at factor costs is not an official universal concept anymore. It could nevertheless be obtained by deducting from Domestic Product at market prices all taxes on production (taxes on products plus other taxes on production), while adding all subsidies on production (subsidies on products plus other subsidies on production).

$$VA_{ne,mp} = W_{ne} + (V_{tnp,ne} - V_{snp,ne}) + OS_{ne} + (V_{tp,ne} - V_{sp,ne}) \quad (25)$$

An alternative way to estimate Domestic Product is *the income approach*. This is shown by identity 25: Domestic Product at market prices ( $VA_{ne,mp}$ ) is equal to compensation of employees paid by domestic producers ( $W_{ne}$ ) plus the other taxes on production ( $V_{tnp,ne}$ ) minus the other subsidies on production ( $V_{snp,ne}$ ) plus the operating surplus/mixed income of domestic producers ( $OS_{ne}$ ) plus the taxes on products ( $V_{tp,ne}$ ) minus the subsidies on products ( $V_{sp,ne}$ ). This identity is also explicitly shown in the macro-economic overview table (table 6.2f).

$$VA_{ne,mp} = FC_{ne} + CF_{ne} + E_{ne} - I_{ne} - CC_{ne} \quad (26)$$

A third basic way to estimate Domestic Product is the *expenditure approach*. According to identity 26, Net Domestic Product at market prices ( $VA_{ne,mp}$ ) is equal to final consumption expenditure ( $FC_{ne}$ ) plus capital formation ( $CF_{ne}$ ) plus exports ( $E_{ne}$ ) minus imports ( $I_{ne}$ ) minus capital consumption ( $CC_{ne}$ ). In gross terms, i.e. ignoring the deduction for capital consumption, this corresponds to the famous Keynesian identity  $Y = C + I + M - X$ . Identity 26 can be obtained by combining identity 24 about the production approach to Domestic Product with identity 23 about the identity between the supply and use of products. Identity 26 is also explicitly shown in the macro-economic overview table (table 6.2f).

#### *Identities for values, prices and volumes*

$$v = p * q \quad (27)$$

Identity 27 states that a value in current prices ( $v$ ) can be decomposed in a price ( $p$ ) and a volume ( $q$ ). For example, the value of output is equal to the average price of output times the volume of output. The identity applies also to many other flows and stocks, like compensation of employees, social benefits and interest.

$$q = v / p \quad (28)$$

This identity implies that a volume ( $q$ ) could be defined as a value in current prices ( $v$ ) divided by a price ( $p$ ; identity 28). For example, the volume of output is equal to the value of output divided by the average price.

$$p = v / q \quad (29)$$

Similarly, a price ( $p$ ) could be defined as a value in current prices ( $v$ ) divided by a volume ( $q$ ; identity 29).

$$\Delta v/v = \Delta p/p + \Delta q/q \quad (30)$$

Identity 30 states that the relative change in a value ( $\Delta v/v$ ) can be decomposed in a price change ( $\Delta p/p$ ) and a volume change ( $\Delta q/q$ ). For example, the relative change in the value of output is (approximately) equal to the change in the average price plus the relative change in the volume.

$$\Delta q/q = \Delta v/v - \Delta p/p \quad (31)$$

Similarly, the relative change in volume ( $\Delta q/q$ ) can be decomposed in a relative change in value ( $\Delta v/v$ ) and a change in price ( $\Delta p/p$ ; identity 31).

$$\Delta p/p = \Delta v/v - \Delta q/q \quad (32)$$

This implies also that the relative change in price can be decomposed in the relative change in value and a relative change in volume (identity 32).

$$cv_t = v_t / (1 + (\Delta p/p)_t) \quad (33)$$

A value in constant prices can be defined as a value in current prices deflated by a price change (identity 33). For example, in the macro-economic overview table (table 6.2f), the value of 2008 in constant prices (e.g. 649; third column in table 6.2f) is calculated by dividing the value in current prices (661; last column) by the price change in 2008 (1,8%; fourth column).

$$(\Delta p/p)_t = (v_t / cv_t) - 1 \quad (34)$$

Identity 33 implies also that the price change can be obtained by dividing the value in current prices by the value in constant prices (identity 34).

$$(\Delta q/q)_t = (cv_t / v_{t-1}) - 1 \quad (35)$$

According to identity 30, the value change between two successive periods can be decomposed into a price change and a volume change. The price change can be obtained from values in current and constant prices (identity 34). This implies that volume change can also be obtained from values in current and constant prices, i.e. the volume change is equal to the relative change between the value in constant prices and the value in current prices of the previous period (identity 35). This identity is also shown in the macro-economic overview-table (table 6.2f; the first three columns), e.g. the volume change of Domestic Product in 2008 (3,8%) is equal to the value of Domestic Product in constant prices in 2008 (649) divided by the value of Domestic Product in current prices in 2007 (625).

$$VA_{ne,mp,cp} = FC_{ne,cp} + CF_{ne,cp} + E_{ne,cp} - I_{ne,cp} - CC_{ne,cp} \quad (36)$$

The identities that hold in current prices can be translated into identities in constant prices. For example, the three basic identities for estimating Domestic Product also apply in constant prices (see the third column of the macro-economic overview table, i.e. table 6.2f). Identity 36 shows the expenditure approach, i.e. Domestic Product in constant prices ( $VA_{ne,mp,cp}$ ) is equal to final consumption expenditure in constant prices ( $FC_{ne,cp}$ ) plus capital formation in constant prices ( $CF_{ne,cp}$ ) plus exports in constant prices ( $E_{ne,cp}$ ) minus imports in constant prices ( $I_{ne,cp}$ ) minus capital consumption in constant prices ( $CC_{ne,cp}$ ).

$$\begin{aligned} VA(\Delta q/q) = & FC(\Delta q/q) * FC/VA + CF(\Delta q/q) * CF/VA + E(\Delta q/q) * E/VA \\ & - I(\Delta q/q) * I/VA - CC(\Delta q/q) * CC/VA \end{aligned} \quad (37)$$

The identities in current prices and constant prices imply also that similar identities hold for volume changes and price changes. For example, according to identity 37 the volume change of Domestic Product is equal to the volume change of the various types of expenditure weighted by their relative size. The macro-economic overview table provides numerical examples on price- and volume change of Domestic Product for the three basic approaches to estimating Domestic Product (see the second and fourth column in table 6.2f).

$$rv_a = v_a / (\Delta p_b/p_b) \quad (38)$$

A real value ( $rv_a$ ) can be defined as a value ( $v_a$ ) deflated by an external price change ( $\Delta p_b/p_b$ ; identity 38). For example, real compensation of employees can be defined as compensation of employees deflated by the price change of final consumption expenditure of households.

$$v_{a/b} = v_a / v_b \quad (39)$$

For users of the national accounts, ratios are very important. Identity 39 defines the ratio of two different values, e.g. government deficit or expenditure as a percentage of Domestic Product.

$$vq_{ab} = v_a / q_b \quad (40)$$

Another common ratio is that of a value divided by a volume, e.g. National Income or government debt per capita or average compensation of employees by industry (identity 40).

$$\Delta p_{a/b} / p_{a/b} = (\Delta p_a/p_a) / (\Delta p_b/p_b) \quad (41)$$

Identity 41 provides the definition of a relative price change, e.g. the price change of product a versus product b or the price change of final consumption expenditure by households (= a) vis-à-vis Domestic Product (= b).

$$q_{a/b} = q_a / q_b \quad (42)$$

Another type of ratios is that of volumes divided by volumes (identity 42). Productivity is the major example. Productivity is defined as the volume of output divided by the volume of input. When there are several types of output and input, productivity is defined as the weighted volume of the various outputs divided by the weighted volume of the various inputs. The notion of productivity is often used to explain changes in the volume of output in terms of changes in the volume of input and changes in productivity.

#### *Other explicit relationships in the sector accounts*

In addition to the many identities discussed above, there are also two other types of explicit relationships are embedded in the sector accounts (and input-output tables).

Firstly, *many flows and stocks are inter-linked in order to show their natural or logical relationship*. For example, taxes on products are only levied on output and imports (i.e. only on both transactions in products). Furthermore, subsidies on products are only granted for imports, market output and output for own final use but not on other non-market output. Similarly, investment grants are defined with explicit reference to capital formation. Other cases in point are the strict links between consumption of fixed capital and fixed assets and loans and between output and produced assets. These explicit relationships are embedded in the classification of flows and stocks and contribute substantially to the coherence and consistency of the sector accounts (and input-output tables).

Secondly, there are several explicit relationships between the sectors and specific flows and stocks. For example, by definition, some transactions can only be received or paid by the sector government<sup>62</sup>. Cases in point are taxes, subsidies, social assistance benefits, social security benefits and investment grants. *In this way, the classification of flows is also linked to the classification of institutional units (and vice versa)*. Other cases in point are:

- Only financial corporations can be involved in financial intermediation;
- Only the sector general government produces other non-market output<sup>63</sup>.

<sup>62</sup> Or the Rest of the World, e.g. foreign national governments or supranational bodies like the European Commission.

<sup>63</sup> This applies also to non-profit institutions serving households.



- Final consumption expenditure is only recorded for the sectors general government and households<sup>64</sup>.

### *Sector accounts and data needs*

The sector accounts are a multi-purpose description of a national economy. They can serve data needs that vary:

- from specific, e.g. data needs focused on one transaction, process or sector. Examples are taxes on products, generation of income, the role of the government or the relationship of the national economy with the Rest of the World in terms of direct investments;
- to general, i.e. the national economy as a whole;
- and from simple, e.g. one figure, relative share or ratio. Cases in point are Domestic Product, Operating surplus as a percentage of Domestic Product, government deficit as a percentage of Domestic Product or income tax as a percentage of total taxes and social security contributions.
- to complex, e.g. a group of figures and their interrelationships, e.g. compensation of employees, disposable income of households and final consumption expenditure by households.

The sector accounts can be used both for comparisons over time (by using sector accounts for different years/periods) and for international comparisons (by using the sector accounts of different countries or groups of countries).

The sector accounts provide a systematic description of the roles played by the individual sectors in each of the sub-processes (accounts) and for specific flows and stocks. The sector accounts can show their absolute size, their relative importance, their development over time and many types of interrelationships and ratios.

In the sector accounts, flows and stocks between the constituent units of a sector are not consolidated as a matter of principle. However, for various types of analysis and policy, a sector is better described as if it were only one unit instead of the aggregate of a whole range of units including their interrelationships. This applies for example to analysis of the sector government where it can be confusing to include the multitude of transfers and financial relations between the various types of government, e.g. between the state government, the municipalities and the social security funds. It applies also to calculating net creditor/debtor positions of sectors.

The sector accounts are flexible to the extent that the detail provided on (sub)sectors, specific flows and stocks can be used to rearrange accounts or to construct alternative concepts and presentations. This topic is elaborated in section 6.9.

### *Supplementary tables: overviews on redistribution*

In the standard sector accounts, the distinction between redistribution in cash and in kind plays a major role. For example, social security benefits in cash are recorded in the secondary distribution of income account, while the social security benefits in kind are recorded in the use of disposable income account (or redistribution of income account).

However, an important alternative distinction for the redistribution of income is that between insurance and other income transfers. This distinction is also present in the classification of flows. Tables showing the redistribution of income from this perspective can therefore easily be derived. Table 6.2k shows the redistribution of income due to insurance in Polderland. The various types of insurance, like social security, pensions, other social insurance and casualty insurance are systematically distinguished. The correction for pension fund reserves is also included, because it ensures that the difference between net pension contributions and benefits is not recorded as a redistribution of income between different the pension funds and the sector households. Table 6.2l shows the redistribution of income not due to insurance, like taxes, gifts and social assistance benefits.

Redistribution involves also capital transfers. So, a complete picture of redistribution in a national economy should cover income and capital transfers. Such an overview is provided

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<sup>64</sup> This applies also to non-profit institutions serving households.

by table 6.2m. The table starts with the balance of primary income. Disposable income is obtained by adding the redistribution of income in cash. In order to obtain a proper picture of the redistribution this includes the correction for pension fund reserves. The concept of disposable income in table 6.2m deviates thus in this respect from the standard concept. By adding the redistribution of income in kind adjusted disposable income (including the correction for pension fund reserves) is obtained. By adding the redistribution due to capital transfers a completely new balancing item is obtained: saving plus capital transfers. The difference between saving plus capital transfers and the balance of primary income indicates the net redistribution.

## 6.2.2 Discussion

This section discusses the relevance of the standard national accounts' description of the national economy. This relevance will be investigated:

- by looking at what can be observed readily: national accounts as a model of the real world;
- by comparing Domestic Product and welfare;
- by discussing three major requirements for the standard national accounts: consistency, comparability and operational.

### *Model of the real world?*

The sector accounts may seem to describe the flows and stocks of the national economy as they occur. However, it is not a complete picture but a selective view of the national economy. Major economic items excluded are unpaid household services, volunteer services, leisure time and tax expenditure. Furthermore, the sector accounts are in many respects a drastic transformation of the flows (and stocks) as they occur.

A substantial part of these flows and stocks is omitted, added, translated into monetary terms, netted, partitioned or re-routed:

- Omitted flows. In the administrative records of big enterprises and government units, a great part of the flows recorded pertain to internal flows, i.e. flows between different organisational units. In the sector accounts, these internal flows are omitted (except when it concerns transactions in products between different establishments of the same institutional unit or when a quasi-corporation should be split off as a separate institutional unit).
- Added flows. For example, retained earnings on direct foreign investment are "treated as if they were distributed and remitted to foreign direct investors in proportion to their ownership of the equity of the enterprise and then reinvested by them" (ESA95, paragraph 4.66).
- Non-monetary flows translated into monetary terms, e.g. services of owner-occupied dwellings, wages in kind or own-account construction of dwellings and machinery.
- Netted flows. Clear cases in point are changes in inventories and the net acquisition of financial assets. However, also final consumption expenditure by households and fixed capital formation are netted flows as the sales from consumer durables or fixed assets are to be deducted.
- Partitioned flows, e.g. non-life insurance premiums are split into two quite different transactions: payments in return for non-life insurance services provided and net non-life insurance premiums.
- Re-routed flows. An example is an employers' social contribution paid directly by employers to social insurance funds. This is recorded as two separate transactions where also the employees are explicitly involved: employers pay employers' social contributions to their employees and the employees pay the same contributions to social insurance funds. Another case in point are social assistance benefits granted and financed by the state government but actually paid out by a non-profit institution (e.g. a war victims organisation). This should be recorded as a social assistance benefit by the state to the household and as a transfer by the state to the non-profit institution by amount of the administrative charges.

These transformations are required for various reasons, e.g. to bring the economic substance behind the economic flows, to select the most relevant flows, to allow observation and to have a balanced set of accounts. These transformations indicate also that the national accounts do not record actual money flows and their counterparts as such.

In principle, many other transformations could have been added, e.g.:

- The netting of social benefits for taxes to be paid out of these benefits;
- Adding subsidies for charging non-market prices to business (e.g. for energy);
- Adding income transfers to households by amount of specific tax expenditure (e.g. personal income tax reduction due to deductibility of interest on mortgages)
- Correcting interest payments for holding loss on the loan due to general inflation.

For some purposes, like international comparisons of social benefits and subsidies, such transformations are very relevant and sometimes even indispensable. However, it would further complicate the accounting system and introduce concepts that deviate more from what can readily be observed.

The sector accounts are based on the idea of the economic circuit. In its presentation of the non-financial accounts it also suggests a clear sequence in this circuit. The non-financial accounts seem to describe the economy as a chain of subsequent processes in which a process only starts after the previous process has been completed. For example, according to the presentation in the accounts, primary incomes like interest can only be paid after production and generation of income have been completed. Similarly, following the sequence of accounts, final consumption only occurs after primary incomes have been received and taxes have been paid. The sequence of accounts also suggests that final consumption is financed out of disposable income. The simplification of a sequence of processes is helpful in creating meaningful balancing items and showing in a not too complex way some major interactions between the various processes. However, in the actual economy no such simple sequence of processes and interactions exists.

The sector accounts are not based on one grand vision of the national economy. It is a mixture of strict bookkeeping logic, economic principles, administrative concepts and specific national accounts conventions. The specific national accounts conventions often originate from the various different perspectives, e.g. that of financial corporations or the government. Similarly the economic principles and administrative concepts often reflect a specific perspective. This implies that the national accounts description of the national economy reflects a mixture of perspectives and can only be understood in relation to all these specific perspectives. Furthermore, the national accounts description of a specific perspective can only be understood in relation to the description of the national economy and the other perspectives. In terms of systems theory it means that the whole can only be understood as the sum of its components and that parts can only be understood as parts of the whole.

### *Domestic Product and economic growth as yardsticks of welfare?*

Domestic Product or National Income should not be regarded as a yardstick of welfare. The volume change of Domestic Product is often referred to as economic growth. However, this also does not indicate changes in welfare. The guidelines are very explicit about this (see sections 3.3 and 3.4). A listing of the twelve major reasons why there is no clear link with welfare<sup>65</sup> can clarify this issue.

The first reason is that Domestic Product and economic growth do not take account of the size and development of economic activities outside the standard national accounts production boundary. This applies in particular to unpaid household services and volunteer work. The consequences of this are that e.g.:

- Marrying your housekeeper reduces Domestic Product (the classic example);
- Countries where relatively much of housekeeping is explicitly paid for will have –*ceteris paribus*– a higher Domestic Product (per capita).

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<sup>65</sup> A good overview of the limitations of GDP as a measure of social welfare is provided by van den Bergh (2008).

- A government policy which results in a substitution of paid services by unpaid personal services reduces Domestic Product, e.g. a government policy stimulating the care of sick or old people by their family or volunteers;
- Increased participation of women in paid employment may induce substitution of unpaid services by paid services, e.g. eating in restaurants, engaging housekeeper or care-taking of children by a crèche; this substitution increases Domestic Product;
- Substitution of many small retail shops by few large retail shops may amount to a substitution of paid services by unpaid services, e.g. because trends towards large retail shops usually imply that households have to transport their purchases over a longer distance (in the old situation this was done by/on behalf of the small retailer).

The second reason is that Domestic Product and economic growth ignore the size of the population. As a consequence, Domestic Product and economic growth per capita are better (i.e. less worse) indicators of (changes) in welfare.

The third reason is that Domestic Product and economic growth ignore leisure time, e.g. differences in average working hours and holidays. In the standard national accounts, the carrying of water is now regarded as a productive activity. This implies that the arrival of water pipes can drastically reduce this productive activity, while drastically increasing leisure time. This reduces Domestic product and economic growth, while it contributes positively to welfare.

The fourth reason is that Domestic Product and economic growth ignore the distribution of income. In calculating Domestic Product and economic growth the income of households are weighted implicitly by –more or less- the relative size of their expenditure. This implies that the rich are much more important for Domestic Product and economic growth than the poor. In fact, it could happen theoretically that one rich family bears nearly all the fruits of Domestic Product and economic growth, while exploiting all the other inhabitants.

The fifth reason is that Domestic Product and economic growth ignore various external effects, e.g. environmental damage or the stress or joy of having work.

The sixth reason is that the prices in the national accounts do not measure utility. Suppose the market values in the national accounts do indeed measure marginal utility as suggested by economic theory. They therefore ignore all consumer surpluses. Furthermore, it is to be doubted whether utility is cardinal and whether welfare can be calculated by simply adding up the utilities of individual consumers.

The seventh reason is that –from a welfare point of view- part of the final consumption recorded in the standard national accounts should better be regarded as intermediate consumption or as regrettable necessities. This applies e.g. to household expenditure on travelling to work or government expenditure on infrastructure and defence. Changes in the importance of such expenditure also affect economic growth. An example may illustrate this. Suppose toll is introduced on some of these roads and producers are fully compensated for this new levy by a reduction in corporate income tax. According to the standard national accounts this will reduce Domestic Product and economic growth, as intermediate consumption increases by amount of the toll paid by producers, while final consumption expenditure decreases by the same amount. So, Domestic Product and economic growth are reduced due to the introduction of toll, while –*ceteris paribus*- welfare is unchanged.

The eighth reason is that volumes are not or –from a welfare point of view- not well defined. Volumes not defined at all in the standard national accounts are those with respect to insurance and banking services. From a welfare point of view, the volume of health care is not well defined in the national accounts. For example, whether or not an operation is successful does not influence the volume of health care. Furthermore, suppose a campaign of preventive health care is very successful according to all standards, e.g. people adopt more healthy/less dangerous lifestyles, illnesses of all population groups are drastically reduced and the savings in the expenditure on health care exceed by far the expenditure on the campaign of preventive health care. According to the standard national accounts, this implies that the volume of health care is drastically reduced with concomitant negative effects on Domestic Product and economic growth.

The ninth reason is that Domestic Product and economic growth do not take account of differences in natural circumstances, e.g. the climate and the space available per inhabitant.

The tenth reason is that Domestic Product and economic growth ignore the transfers with the Rest of the World, e.g. transfers to family abroad.

The eleventh reason is that the other changes in assets are ignored. Cases in point are holding gains and losses on dwellings and financial assets or the consequences of earthquakes and flooding. It also includes changes in the value of natural assets, e.g. due to the exhaustion of the oil reserves, the forests or the fish.

The twelfth reason is that -from an economic theoretic point of view- welfare should be regarded as something like sustainable consumption, i.e. by taking into account the net discounted value of all future revenue and expenditure (see e.g. Weitzman, 1976). This implies that the fluctuations in Domestic Product and economic growth due to business cycles and specific events are irrelevant for welfare. It also implies that the liabilities (e.g. pension liabilities) and dangers of tomorrow (e.g. world wars and natural disasters) are relevant for the welfare of today.

Some of these limitations of Domestic Product in view of welfare can be overcome by taking into account changes in flows recorded elsewhere in the national accounts, e.g. holding gains and losses. Some other limitations can be overcome by making supplementary estimates, e.g. by drawing up a welfare oriented satellite (see section 6.9.). However, all such efforts will still result in rather imperfect measures of welfare, as some of limitations mentioned can not be overcome in a satisfactory way<sup>66</sup>.

### *Consistency*

A major requirement for a description of the national economy is consistency. Consistency ensures that the national economy can be described and analysed in all its interrelationships, components and aspects. By imposing consistency:

- *parts add up to the whole*. As a consequence, by describing all parts also the whole is described. For example, by describing the development of output in each industry the developments of output in the whole national economy is described.
- *the whole is broken down into well-defined parts*. So, if the development of the whole is not immediately well understood, it can be analysed by analysing the development of its parts. For example, by analysing which industries contributed most to a drastic increase in capital formation in the whole national economy.
- *ratios of two concepts become meaningful*. For example, value added per hour worked is only meaningful when there is consistency between the concepts of value added and hours worked. The same applies to ratios like National Disposable Income per capita, capital formation as a percentage of capital stock and government deficit as a percentage of National Income.
- *identities necessarily hold*, e.g. the identity between the supply of goods and services and the use of goods and services or the three basic approaches to Domestic Product.
- *causes and effects can be analysed throughout the whole accounting system*, e.g. between disposable income and final consumption expenditure, between prices and volumes of production and prices and volumes of employment or between transactions in goods and services and financial flows.

Without ensuring consistency, description and analysis of data becomes confused, without any clear meaning and may even end up in utter nonsense-conclusions.

*From a statistical point of view consistency is also important.* We can distinguish two cases. Firstly, when information on one variable in an identity is missing, an estimate of this variable can be derived as the residual of the other variables. For example, saving can be estimated as the difference between disposable income and final consumption expenditure. Similarly, when the excise duty on wine sold is 10% of the value, the excise on wine received by the government can be used to estimate the value of wine sold. Secondly, when

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<sup>66</sup> The limitations of GDP as a welfare measure do not invalidate its usefulness for policy. This issue is discussed in section 8.4.

information on all variables in an identity is present, consistency is a check on the reliability and completeness of the individual estimates and helps to find errors and omissions.

The consistency of the standard national accounts' description of the national economy is therefore an important quality. However, this consistency has also two drawbacks. The first drawback is that it drastically *limits the range of concepts that can be included in the accounting system*. Some concepts may be easy to combine. However, other concepts, like the extended concepts of income, are difficult to reconcile with other concepts used in economic theory and policy. Consistency enforces therefore some clear choices.

The second drawback of consistency is the *negative external effect of specific conventions needed for one part (use) of the accounting system for other parts (uses)*. For example, in order to properly account for insurance output, only the implicit service charge should be regarded as the price of the insurance services. This could be regarded as the negative external effects of properly accounting for insurance output (see Annex 6A for a more economic theoretic view on defining insurance output). Similarly, accounting for government output at production costs introduces substantial double-counting, which make the government accounts much less suited as a description of government finance (see section 6.5). Furthermore, for some types of production, like the output of financial services or government services, prices and volumes are difficult to define and measure. However, consistency requires that also for these services prices and volumes are defined and measured. Finally, employing one set of accounts for all sectors and the national economy results in an accounting framework that is much more complex and detailed than needed for each individual sector. For some sectors, it even applies that the accounts are presented in an inappropriate sequence (e.g. for the non-financial corporations, see section 6.3).

A fundamental reason for the need of specific conventions is that the world does not fully comply with the economic processes and transactions distinguished by the standard national accounts. For example, insurance is a mixture of producing services, redistribution of income and financial transactions. So, in order to fit the real economy into a meaningful model all kinds of specific corrections are required. Furthermore, in order to arrive at proper balancing items and a good link with the balance sheets often extra corrections are needed to compensate for these specific corrections. So, in a consistent accounting system, introducing one correction, introduces new ones including consequences for corresponding financial and non-financial transactions, for the underlying prices and volumes and for the classifications used.

The accounting framework does allow some flexibility for artificial but consistent solutions, e.g. by mixing different principles or by stapling different dimensions. However, the danger for exploiting this flexibility is that the general logic of the accounting framework and its concepts gets lost. A case in point is the new concept of social benefits in kind. By introducing this concept the distinction between in cash and in kind benefits is stressed. However, the consequence is that the basic distinction between insurance benefits (that are linked to insurance premiums) and other benefits is lost. The standard national accounts also include examples of consistent but a-symmetrical treatments, e.g.:

- The purchase of a car by a producer is regarded as a long-term investment and therefore treated as capital formation, while the purchase of a car by a consumer is not recorded as capital formation.
- Reinvested earnings on direct investment are only recorded for foreign direct investment.
- Net operating surplus is only recorded for market output and not for other non-market output.

These a-symmetrical treatments of fundamentally the same phenomena introduce systematic biases in the national accounts description and should therefore be avoided.

### *Comparability over time and space*

The concepts of the standard national accounts should be relevant to the wide spectrum of economies all over the world; these economies are also changing ways over time. This implies that the concepts should be meaningful for comparisons over time and space. This requirement is met in various ways by the standard national accounts:

- By presenting a very general accounting structure with exhaustive and detailed classifications, e.g. of industries, products and financial assets;
- By choosing a production boundary which is relevant to developed and developing countries alike, e.g. including also many types of production for own final use;
- By choosing a sector classification which shows explicitly major types of institutions relevant all over the world, e.g. the government, pension funds and self-employed;
- By choosing a classification of transactions which explicitly reveals many institutional differences. For example, the breakdown of compensation of employees shows the importance of compensation in kind and the size of social contributions paid by employers or employees.
- By incorporating price- and volume-measures and purchasing powers.

Nevertheless, the national accounts concepts have also some clear *limitations* for intertemporal and international comparisons, for example<sup>67</sup>:

- They compare only what is inside the accounting framework; all economic flows and stocks outside the framework and their interactions with what is inside are not accounted for. For example, there may be clear trends towards a substitution of unpaid household services into paid services. The national accounts record only the development in the paid services without showing the relationship with the unpaid services.
- Some national accounting conventions are rather rude and may therefore distort such comparisons, e.g. the convention to record all other non-market output of the government as final consumption, the convention to record only explicit subsidies and income transfers and not various types of tax expenditure or the convention not to correct interest payments for a compensation of holding loss due to general inflation.
- Some of the concepts are defined in a too general way. For example, in the SNA93, the concepts of market output and market producers are very vague. As a consequence, the valuation of output and the scope of the sector government are not well defined. In order to remedy this for EU-Member States, the ESA95 contains more stringent definitions of market output and market producers. Furthermore, in both the SNA93 and ESA95, the volume of the output of insurance services and financial intermediation services indirectly measured is not even defined vaguely but not at all. As a consequence, a part of the concept of economic growth (the volume growth of Domestic Product) has been left undefined.
- In case of substantial inflation, the Achilles' heel of the national accounts is hit, i.e. counting in monetary terms in order to arrive at totals and balancing items. The relevance of annual totals and balancing items depend crucially on the premise that flows pertaining to different times in a year can be meaningfully added and subtracted at their current exchange values and then be deflated with one price-index for the whole year. However, in case of substantial inflation, this premise does not hold, as prices will change unevenly over the year and flows will also generally fluctuate within the year.

The first two types of limitations could be overcome by drawing up satellites explicitly showing the importance of e.g. unpaid households services and tax expenditure. The problem of the too general definitions can be solved by providing more specific definitions. However, it should be realised that one can not draw up an endless range of satellites for all extra data needs. Furthermore, more specific definitions are never specific enough to do full justice to the wide spectrum of circumstances all over the world. The problem of substantial inflation can be modified by compiling quarterly or monthly sector accounts. However, this is generally not feasible for practical reasons. Therefore, in the end, the solution is that all major conceptual (and statistical) limitations, should be taken into account by the data user in the interpretation and actual use of the figures.

### *Operational*

An important requirement for the standard national accounts is that the concepts should be operational as they are intended for compiling statistics. However, the concepts should be not

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<sup>67</sup> See also Bos (1994c).

too specific, as what is operational depends on the data sources and specific circumstances of each country. As a consequence, the universal concepts should be operational in a general way.

This requirement is in most respects met. This is evidenced by e.g.:

- The format of the supply and use tables: it is designed to fit in with most of the statistical information that can be obtained, e.g. industry by product and not industry by industry.
- The choice of the central principle of valuation: current exchange value;
- The adoption of some simplifying conventions, e.g. by recording all other non-market output by the government as final consumption expenditure.
- By accompanying some concepts with clear indications how to estimate them. For example, in defining capital consumption and fixed capital stock reference is made to the Perpetual Inventory Method and linear depreciation.
- By clearly indicating the estimation problems for some concepts. For example, the ESA95 clearly states that trade-margins should in principle not include holding gains and losses. It also adds that data sources may not allow to separate out all the holding gains and losses (e.g. ESA95, para 3.60).
- By recommending Laspeyres-volume measures, Paasche-price measures and annual rebasing as an approximation of Fisher-volume and price measures.

Of course, some definitions are not very operational. Some concepts have been defined in a too general way (see above) and others have been defined in a too specific way. A major example of too specific concepts is the recording of taxes and social contributions on accrual basis. This often does not seem feasible and meaningful. For example, strict application of this principle in the Netherlands would amount to changes in the estimates of corporation tax with 5 or more years delay, because old losses reduces the taxable corporate income in later years. Furthermore, recording taxes on the basis of tax assessments (see also section 6.5.1) can systematically overestimate the taxes actually to be paid. In some countries, it is common practice that a substantial part of the tax assessment will never lead to the actual payment of the taxes, e.g. enforcing the payment may be a problem or the tax assessment is the first step in a negotiation process about the amount actually to be paid. Taxes on accrual basis can therefore give a too optimistic view on government finance. Therefore, in the European Monetary Union, taxes on cash basis (corrected for minor delays in the actual payment of the taxes) are accepted for calculating government deficit or surplus; taxes on cash basis are also used to check the absence of systematic biases in the taxes on accrual basis.

Another aspect of operational is *harmonisation with the concepts used in other international statistics*, e.g. statistics on manufacturing, statistics on external trade and statistics on employment. This harmonisation greatly aids the linkage to and comparison with these figures. As a consequence, better national accounts statistics can be compiled. Furthermore, the information contained in these specific statistics can now be better related to the general statistics on the national economy, i.e. the national accounts figures like GNP or value added per industry and sector. The national accounts statistics can then serve as the central frame of reference for social and economic statistics.

In designing the new standard national accounts, achieving this harmonisation was also a major issue. In several important respects, this was successful, e.g. harmonisation between the SNA93 and ESA95 and harmonisation with the IMF-guidelines on Balance of Payments. However, in some other respects or at a more detailed level, work is still to be done. For example, the international guidelines on statistics on Research and Development (OECD's Frascati-Manual; see the Annex in Bos, Hollanders and Keuning, 1992) and education (OECD's Education at a Glance) are in several respects inconsistent with the national accounts guidelines. The same applies to the European statistics on manufacturing: they are based upon institutional units and not on establishments or local kind of activity units, as prescribed for all national accounts statistics by industry. Furthermore, the SNA93 and ESA95 concepts on employment have been defined in a very general way in order to hide the differences between the ILO-concepts and official European concepts.



### 6.2.3 Summary

The standard national accounts describe the national economy in terms of a uniform and consistent set of definitions of flows and stocks embedded in a uniform set of accounts. The same set of definitions and accounts is also applied to individual sectors. In this way, the national economy can be analysed in its interactions with the individual sectors.

The major features of the logical structure of the standard national accounts are:

- The flows, stocks and actors are classified in an exhaustive and non-overlapping way.
- The various types of flows and stocks are grouped into accounts in order to describe various economic processes and their balancing items (the net results of these economic processes).
- The basic accounting principle is quadruple-entry bookkeeping (the identity of the balance sheet plus the identity for transactions and financial assets between various units); this is combined with the identity between value, price and volume;
- From the basic identities many other important identities and definitions are derived, e.g. identities in constant prices, the three ways to estimate Domestic Product or ratios like National income per capita and productivity.
- Various other economic and institutional relationships are embedded in the various definitions, e.g. the relationship between taxes on products and production and imports.

The standard national accounts description of the national economy is not a direct reflection of what can be readily observed. It transforms economic reality into the mould of a model with accounts, balancing items and consistently defined prices and volumes. To this end, several flows and stocks that can be observed readily are omitted, three times recorded, translated into monetary terms, netted, partitioned and re-routed.

The standard national accounts do not reflect one grand vision on the national economy. It is a synthesis of various perspectives on the national economy. The standard national accounts are a complex accounting system. This reflects the complexity and heterogeneity of the world, where simple rules are generally too simple, where different perspectives make sense, where many different administrative systems are used and where always important borderline cases exist.

The standard national accounts have a broad scope including many different economic categories, but do not aim to measure welfare. The standard national accounting concepts meet in several ways the requirement to be operational and comparable, but do not fully meet these requirements.

## 6.3 Non-financial corporations

### 6.3.1 Description (including supplementary concepts and tables)

#### *Delimitation of non-financial corporations*

Non-financial corporations are one of the major groups of economic actors in the national economy. Their principal role is that of producers of goods and services. The Polderland-statistics can be used to illustrate their importance. Non-financial corporations are responsible for about 60% of Domestic Product and a similar part of domestic employment. They are even more important for economic growth, as they are growing faster than the rest of the national economy.

The sector Non-financial corporations covers corporate market producers of non-financial products. It includes a wide range of units. These units can be private corporations but also corporations controlled by the government, e.g. a national railway company. The legal status can be that of a corporation but can also be that of a non-profit institution. Cases in point are non-profit institutions mainly selling their output (e.g. hospitals mainly financed by private and social insurance) and non-profit institutions serving business (e.g. employers' organisations). Some units can be quasi-corporations. These units are part of the administration of another unit, have no independent legal status but act economically and financially as if they were 'real' corporations. This can apply to units embedded in a government administration (e.g. to a public transport service of a municipality) or to very big unincorporated units owned by households (e.g. a chain of fashion stores owned and run by one family).

All corporations are restricted to the domestic affiliates; foreign branches or subsidiaries are regarded as the corporations of other countries. This implies also that domestic branches or subsidiaries of foreign corporations are regarded as domestic corporations.

The guidelines recommend splitting the sector non-financial corporations into three sub-sectors:

1. public non-financial corporations, i.e. controlled by the sector government;
2. national private non-financial corporations, i.e. controlled by national private corporations or households;
3. and foreign controlled private non-financial corporations, i.e. controlled by foreign private corporations or households.

In our Polderland-statistics, only tables are shown for the whole sector non-financial corporations.

#### *The tables*

The non-financial corporations are described by five tables: a current account (table 6.3a), an accumulation account (table 6.3b), a balance sheet (table 6.3c), a supplementary table on entrepreneurial income (table 6.3d) and a supplementary table with prices, volumes and key-ratios (6.3e). The first three tables provide a coherent overview of the flows and stocks of non-financial corporations in current prices. The other two tables are supplementary tables, i.e. tables not present in the standard national accounts.

#### *The current account*

The current account (see table 6.3a) shows the incoming and outgoing current flows. The balancing item of the current account is disposable income. It is shown at the bottom of the table. Disposable income indicates the net result of the current flows. In Polderland, disposable income of non-financial corporations rose from 39 billion euros in 2007 to 40 billion euros in 2008 (+3%).

The current account is split into four sub-accounts, i.e. the production account and three income accounts. Each sub-account describes an economic process.

Table 6.3a Current account for Non-financial corporations

	2007	2008	08-07	08/07
I. Production account				
R Output (at basic prices)	965	1004	39	4%
U Intermediate consumption	541	557	16	3%
Consumption of fixed capital	63	66	3	5%
Net value added (at basic prices)	361	381	20	6%
II. Income accounts				
II.1.1 Generation of income account				
R Net value added at basic prices	361	381	20	6%
U Compensation of employees	250	265	15	6%
Other taxes on production	4	4	0	0%
Other subsidies on production	-3	-5	-2	67%
Operating surplus	110	117	7	6%
II.1.2 Allocation of primary income account				
R Operating surplus	110	117	7	6%
Property incomes receiveable	38	38	0	0%
interest	15	14	-1	-7%
dividend	15	15	0	0%
reinvested earnings on direct foreign investment	8	9	1	13%
U Property incomes payable	81	85	4	5%
interest	41	40	-1	-2%
dividend	31	36	5	16%
reinvested earnings on direct foreign investment	3	5	2	67%
rent on land and subsoil-assets	6	4	-2	-33%
Balance of primary incomes	67	70	3	4%
II.2 Secondary distribution of income account				
R Balance of primary incomes	67	70	3	4%
Current transfers receiveable	14	16	2	14%
U Current taxes on income, wealth, etc.	28	29	1	4%
Other current transfers payable	14	17	3	21%
Disposable income (= Saving)	39	40	1	3%

Table 6.3b Accumulation account for Non-financial corporations

		2007	2008	08-07	08/07
	III.1. Capital account				
A	Gross capital formation	82	89	7	9%
(=U)	minus: Consumption of fixed capital	-63	-66	-3	5%
	Acquisition of other non-financ. assets	2	2	0	0%
L	Saving (= Disposable income)	39	40	1	3%
(=R)	Capital transfers receivable	2	2	0	0%
	Net borrowing	-20	-17	3	-15%
	III.2 Financial account				
A	Net acquisition of financial assets	70	87	17	24%
	<i>P.M. Reinvested earnings on direct foreign inv.</i>	8	9	1	13%
L	Net incurrence of liabilities	50	70	20	40%
	<i>liabilities to creditors</i>	43	55	12	28%
	<i>shares and other equity</i>	7	15	8	114%
	<i>P.M. Reinvested earnings on direct foreign inv.</i>	3	5	2	67%
	Net lending	20	17	-3	-15%
	III.3 Other changes in assets account				
A	Other changes in non-financial assets	15	14	-1	-7%
	volume changes	-6	-7	-1	17%
	nominal holding gains	21	21	0	0%
	neutral holding gains	27	9	-18	-67%
	real holding gains	-6	13	19	317%
	Other changes in financial assets	25	33	8	32%
	volume changes	1	1	0	0%
	nominal holding gains	24	32	8	33%
	neutral holding gains	12	4	-8	-67%
	real holding gains	12	24	12	100%
L	Other changes in liabilities to creditors	1	2	1	100%
	volume changes	1	2	1	100%
	nominal holding losses	0	0	0	
	neutral holding losses	19	8	-11	-58%
	real holding losses	-19	-8	11	-58%
	Other changes in shares and other equity	232	266	34	15%
	volume changes	0	0	0	
	nominal holding losses	232	266	34	15%
	neutral holding losses	13	5	-8	-62%
	real holding losses	219	261	42	19%
	Net other changes	-193	-221	-28	15%

Table 6.3c Balance sheet for Non-financial corporations

	2007	2008	08-07	08/07
IV.1 Opening balance sheet				
A Non-financial assets	1230	1266	36	3%
Financial assets	540	635	95	18%
L Liabilities	1397	1680	283	20%
<i>liabilities to creditors</i>	<i>610</i>	<i>654</i>	<i>44</i>	<i>7%</i>
<i>shares and other equity</i>	<i>787</i>	<i>1026</i>	<i>239</i>	<i>30%</i>
Net worth	373	221	-152	-41%
<i>P.M. Net worth to the owners</i>	<i>1160</i>	<i>1247</i>	<i>87</i>	<i>8%</i>
IV.2 Changes in balance sheet				
A Changes in non-financial assets	36	39	3	8%
Changes in financial assets	95	120	25	26%
L Changes in liabilities	283	338	55	19%
<i>liabilities to creditors</i>	<i>44</i>	<i>57</i>	<i>13</i>	<i>30%</i>
<i>shares and other equity</i>	<i>239</i>	<i>281</i>	<i>42</i>	<i>18%</i>
Changes in net worth	-152	-179	-27	18%
<i>P.M. Change in Net worth to the owners</i>	<i>87</i>	<i>102</i>	<i>15</i>	<i>17%</i>
IV.3 Closing balance sheet				
A Non-financial assets	1266	1305	39	3%
Financial assets	635	755	120	19%
L Liabilities	1680	2018	338	20%
<i>liabilities to creditors</i>	<i>654</i>	<i>711</i>	<i>57</i>	<i>9%</i>
<i>shares and other equity</i>	<i>1026</i>	<i>1307</i>	<i>281</i>	<i>27%</i>
Net worth	221	42	-179	-81%
<i>P.M. Net worth to the owners</i>	<i>1247</i>	<i>1349</i>	<i>102</i>	<i>8%</i>

Table 6.3d Entrepreneurial income of non-financial corp. before and after tax (supplementary table)

	2007	2008	08-07	08/07
Operating surplus	110	117	7	6%
plus: Interest receiveable	15	14	-1	-7%
plus: Dividends receiveable	15	15	0	0%
plus: Reinvested earnings on direct investment receiveable	8	9	1	13%
minus: Interest payable	-41	-40	1	-2%
minus: Rent on land and subsoil assets payable	-6	-4	2	-33%
Entrepreneurial income before tax	101	111	10	10%
minus: Current taxes on income and wealth	-28	-29	-1	4%
Entrepreneurial income after tax	73	82	9	12%
minus: Dividends payable	-31	-36	-5	16%
minus: Reinvested earnings on direct foreign investment payable	-3	-5	-2	67%
minus: Gross capital formation	-82	-89	-7	9%
minus: Acquisition of other non-financial assets	-2	-2	0	0%
plus: Consumption of fixed capital	63	66	3	5%
plus: Other income and capital transfers receiveable	16	18	2	13%
minus: Other income and capital transfers payable	-14	-17	-3	21%
Net lending	20	17	-3	-15%

Table 6.3e Prices, volumes and key-ratios for non-financial corporations  
(supplementary table)

	2007	2008
Price-changes		
1 Output	2.4%	0.5%
2 Intermediate consumption	2.8%	-0.6%
3 Consumption of fixed capital	1.7%	1.7%
4 Value added	2.0%	2.1%
5 Capital formation	1.7%	1.7%
6 Compensation of employees (price per hour worked)	2.1%	2.6%
7 General price-change of goods and services	2.2%	0.7%
8 Nominal interest rate (long term)	5.2%	4.4%
9 Real interest rate (long term)	3.0%	3.7%
Volumes		
1 Output (% change)	5.2%	4.0%
2 Intermediate consumption (% change)	5.6%	4.6%
3 Consumption of fixed capital	3.5%	3.1%
4 Value added (% change)	4.3%	3.9%
5 Capital formation (% change)	5.7%	6.8%
6 Volume of labour (% change)	1.5%	3.2%
7 Volume of labour (abs. change)	0.1	0.2
8 Volume of labour (level, millions)	7.2	7.4
9 Labour productivity change	2.8%	0.7%
10 Real change in net worth to owners (billion euros)	59	79
due to real saving and capital transfers	40	42
due to real other changes in the volume	-6	-8
due to real holding gains on assets	6	37
due to real holding gains on liabilities to creditors	19	8
Keyratios		
1 Output per employee (full-time eq.)	134.1	135.0
2 Value added per employee	50.2	51.2
3 Compensation of employees per employee	34.7	35.6
4 Operating surplus per employee	15.3	15.7
5 Entrepr.income before tax % Net Worth to owners	8.7%	8.9%
6 Entrepr.income after tax % Net Worth to owners	6.3%	6.6%
7 Change in net worth to owners %Net worth to owners	7.5%	8.2%
8 Real change in net worth to owners %Net worth to owners	5.1%	6.3%
9 Solvency ratio, beginning of year	34%	34%
10 Solvency ratio, end of year	34%	35%
11 Relative size in Domestic employment	60%	61%
12 Relative size in Domestic Product	58%	58%

### *Production account*

The production account describes the production process. Output is shown as the resource that corresponds to the uses ('inputs') intermediate consumption and consumption of fixed capital. Intermediate consumption are the current expenditure on goods and services, like the purchase of raw materials, energy costs, the rents of the office and costs for cleaning, maintenance and business services. The balancing item is net value added<sup>68</sup>; it ensures that total uses are equal to total resources on the production account. Net value added is the income generated by the production process.

In Polderland, output of non-financial corporations was 965 billion euros in 2007. Intermediate consumption was 541 billion euros and consumption of fixed capital 63 billion euros. As a consequence, net value added of non-financial corporations was 361 billion euros. In 2008, net value added rose by 6%.

Output is valued at basic prices. This implies that the sales by the producer have been netted for any taxes payable as a consequence of the production or sale of goods and services (i.e. taxes on products). Examples are sales tax, value added tax (VAT) and excise duties. Valuation of output at basic prices implies also that it includes any subsidies payable as a consequence of production or sale of goods and services (i.e. subsidies on products). This pertains e.g. to subsidies on public transport or on agricultural products.

An example may illustrate the concept of output at basic prices. Suppose the sales of a public transport company are 115 million euros of which 15 million euros pertains to VAT. Furthermore, in order to lower public transport prices 35 million euros are received as a subsidy linked to the number of passengers. Output at basic prices is therefore 135 million euros (i.e.  $115 - 15 + 35$ ).

### *Generation of income account*

The three income accounts are the generation of income account, the allocation of primary income account and the secondary distribution of income account.

The generation of income account describes how value added is distributed over employees, the government and the producer. The employees receive their compensation of employees in the form of wages in cash, wages in kind or social contributions by the employer. The government receives taxes on the inputs for the production process, e.g. taxes on owning real estate or a motor vehicle (other taxes on production). However, the government may also pay subsidies for the inputs of the production process, like wage subsidies. The producer receives what is left over of value added. This is labelled the operating surplus and is the balancing item of the generation of income account.

In Polderland in 2007, over two-third of the value added of non-financial corporations is distributed to the employees (250 of 361 billion euros), one percent is paid to the government (4 billion euros), less than one percent is received as a subsidy from the government (3 billion euros) and nearly one third is the operating surplus for the producer (110 billion euros). In 2008, value added increased with 20 billion euros, while compensation of employees increased with 15 billion euros, other taxes on production remained stable and other subsidies received increased with 2 billion euros. As a consequence, the operating surplus of non-financial corporations increased with 7 billion euros.

### *Allocation of primary income account*

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<sup>68</sup> In all our tables only net value added is shown. In the new standard national accounts both gross and net value added are allowed as balancing items. However, from a theoretical point of view net value added (and Net Domestic Product) should be preferred as balancing item. According to the net value added concept, fixed assets like buildings, roads, machinery and cars are also used up in producing output. Net value added treats consumption of such fixed assets similar to the normal costs of maintenance of these assets, the costs of hiring of such assets or other current expenditure on goods and services. For most purposes, net value added seems the most meaningful concept. In practice, gross value added is often preferred because the estimates of capital consumption are assumed to be insufficiently reliable and comparable. However, this argument overlooks the importance of the conceptual bias by using a sub-optimal concept (see Bos, 1992b, see also section 7.4).



The allocation of primary income account describes how the producer's operating surplus is used for paying property incomes, like interest and dividend. The account describes also the property incomes receivable by the producer. These can also be used for paying property incomes. The balancing item of the account is balance of primary incomes. It is the part of national income received by the non-financial corporations.

From the point of view of the corporation, property income payable should be distinguished into two groups: those payable to the owners of the corporation and those payable to third parties. Examples of property incomes payable to the owners are dividends and reinvested earnings on direct foreign investment<sup>69</sup>. Examples of property incomes payable to third parties are interest, rent on land and rent on subsoil assets.

On the basis of this distinction, also a second balancing item can be derived: entrepreneurial income. It is the national accounts' counterpart of business profit before tax. It is defined as the operating surplus plus property incomes receivable minus interest and rent to third parties (see table 6.3d).

In 2007 in Polderland, the operating surplus of non-financial corporations was 110 billion euros. They received 15 billion euros interest, 15 billion euros dividend and 8 billion reinvested earnings on direct foreign investment. They also had to pay 41 billion euros on interest and 6 billion euros on rent on land and subsoil assets (e.g. royalties for being permitted to explore natural gas). As a consequence, entrepreneurial income (before tax) was 101 billion guilders. In 2008, entrepreneurial income (before tax) increased with 10%, while the operating surplus increased with 6%.

#### *Secondary distribution of income account*

The secondary distribution of income account describes the redistribution of the income of non-financial corporations. This includes various types of redistribution: by taxation (e.g. corporation tax and dividend tax), by fines and penalties, by casualty insurance and by unfunded social benefits for their employees (e.g. the payment of pensions to former employees without any separate funding). The net result of the balance of primary incomes and the redistribution of income is disposable income (or saving).

In 2007, the current taxes on income, wealth etc. paid by non-financial corporations amounted to 28 billion euros in Polderland. This is 42% of their balance of primary income.

The other current transfers payable and receivable were both 14 billion euros in 2007. In 2008, these current transfers were nearly the same, 16 and 17 billion euros. Their net effect on the income of non-financial corporations is therefore very small. This is not surprising considering their content. The other current transfers payable consist mainly of net casualty insurance premiums and imputed social contributions by employees. The other current transfers receivable contain mainly casualty insurance claims and unfunded social benefits for employees. In practice, net casualty insurance premiums should more or less cancel out with the casualty insurance claims and the same applies to the imputed social contributions and benefits.

For non-financial corporations, disposable income is equal to their saving (as their final consumption expenditure are by definition zero).

#### *Accumulation account*

The accumulation account (table 6.3b) describes the various types of changes in assets and liabilities and their effect on net worth. The accumulation account can be regarded as a specification of the changes in balance sheet by cause of the change (table 6.3c). In order to stress this link with the balance sheet, the entries on both sides of the accumulation account are not resources and uses but changes in assets (A) and changes in liabilities (L).

The accumulation account consists of three subaccounts: the capital account, the financial account and the other changes in assets account.

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<sup>69</sup> Also withdrawals from quasi-corporations of the government or households are included.

### *Capital account*

The capital account describes the change in net worth due to saving and capital transfers. The capital account also records the net acquisition of non-financial assets: gross capital formation and the acquisition of other non-financial assets. However, the acquisition of non-financial assets does not affect net worth, but only changes the composition of the balance sheet.

The balancing item of the capital account is net borrowing. Net borrowing shows the extent to which net acquisitions of non-financial assets have been financed out of current flows and capital transfers.

The current flows, the capital transfers and the net acquisitions of non-financial assets constitute together all the non-financial flows. As a consequence, net borrowing can also be regarded as the balancing item of all the non-financial flows.

In 2007, saving by non-financial corporations was 39 billion euros. Capital transfers receivable, like investment grants and other capital transfers by government, amounted to 2 billion euros. Gross capital formation, like the purchase of buildings, machinery, cars, livestock and software, was 82 billion euros. In addition, non-financial corporations acquired for 2 billion euros other non-financial assets, like land, subsoil assets, patents, leases and purchased goodwill. Consumption of fixed capital was 63 billion euros. As a consequence, net borrowing by non-financial corporations was negative by amount of 20 billion euros. This implies that the sector is a net lender with a surplus of 20 billion euros. This can be used for financing, directly or indirectly, other sectors.

### *Financial account*

The financial account describes the net acquisition of various types of financial assets and the net incurrence of liabilities. The financial assets include e.g. currency, bonds, shares, consumer and trade credits, options and futures. The liabilities include e.g. loans, trade credits and financial lease contracts. Shares and other equity are regarded as a financial asset. This implies that the liabilities of non-financial corporations include also the value of the shares and other equity of these corporations! For example, issuing shares is recorded as the incurrence of a liability.

The balancing item of the financial account is net lending. This is the same balancing item as the capital account. The reason for this identity is that double-entry bookkeeping ensures that the balancing item of financial transactions is the mirror image of the balancing item of non-financial transactions.

In 2007 in Polderland, the non-financial corporations acquired on a net basis for 70 billion euros on financial assets, while the liabilities incurred increased with 50 billion euros. So, this is the way the net lending of the capital account of 20 billion euros is used by the non-financial corporations.

### *Other changes in assets account*

The other changes in assets account describes the changes in the assets and liabilities that are not the result of transactions. Two types of other changes are distinguished: other changes in volume and nominal holding gains.

For non-financial assets, other changes in volume include a wide variety of increases and decreases. Examples of increases due to other changes in volume are natural growth of non-cultivated fish and timber, gross increases in the proven reserves of natural gas and having something patented. Examples of decreases due to other changes in volume are depletion of subsoil assets, write-off of purchased goodwill, unforeseen obsolescence due to technological breakthroughs or new laws, theft of trucks, epidemic diseases killing cows and pigs and damage to buildings due to fire, riots and abnormal flooding. For financial assets, other changes in the volume include writing-down of bad debts, financial fraud and losses of currency because of fire damage.

The nominal holding gain (or loss) of an asset or liability is the change in value due to a change in its price. In case of rising prices for assets, there is a positive nominal holding gain. The reverse holds for liabilities. In case of rising prices for liabilities, there is a nominal

holding loss. When liabilities or financial assets are not subject to any price changes (e.g. a loan without indexation), no nominal holding gains and losses occur.

In case of inflation, the interpretation of nominal holding gains could be related to those of consumption of fixed capital and property income. For fixed assets, the nominal holding gains can be regarded as a partial compensation for the decrease in value due to consumption of fixed capital. For equity, the nominal holding gains could be regarded as a second source of income next to dividends. For loans with price indexation, the nominal holding loss could be regarded as a second charge next to the interest paid.

From an analytical point of view, nominal holding gains may be misleading, as they do not take into account of general changes in prices. For example, a nominal holding gains on an asset equal to the general change in price does not change the purchasing power of the asset. This limitation of nominal holding gains is overcome by the concept of real holding gains.

*Real holding gains* can be obtained by splitting the nominal holding gains into neutral holding gains and real holding gains. The neutral holding gain is the change in value that would accrue if the price of the assets changed in the same proportion as the general price level<sup>70</sup>. The real holding gain (or loss) is the difference between the nominal holding gain and the neutral holding gain. It indicates the relative price change of the asset, i.e. the extent to which the market price of the asset has increased more (or less) than the general price level.

Real holding gains can also be linked to flows directly related to non-financial and financial assets, i.e. consumption of fixed capital and property income. From the perspective of the real holding gains, a neutral holding gain is required as compensation against general inflationary circumstances.

The merits of the concept of real holding gains (and losses) become most clear for loans without price-adjustment. Nominal holding gains for these liabilities are zero. In case of inflation, the absence of a price-adjustment on a loan should be regarded as a real holding gain to the lender and a real holding loss to the borrower.

In 2007 in Polderland, other changes in volume mostly pertained to non-financial assets. They decreased the value of non-financial assets by 6 billion euros.

Nominal holding gains occurred for all assets. The nominal holding gains on the financial assets were substantial: 25 billion euros in 2007. The nominal holding gains of the non-financial assets were 24 billion euros. For most of the liabilities, no nominal holding losses occurred, as there were no price-adjusted liabilities. However, the value of the shares increased drastically. As a consequence, substantial nominal holding losses were recorded for the liabilities of non-financial corporations (232).

Comparison of these nominal holding gains with the neutral holding gains shows that substantial real holding gains were obtained for financial assets (12 billion euros) and liabilities to creditors (19 billion euros). This was compensated by small real holding losses on non-financial assets (6 billion euros) and very big real holding losses on shares and other equity (219 billion euros).

In 2008, the situation changed substantially for the real holding gains. Due to a relatively modest rise in the general price level, real holding gains on financial assets rose from 12 billion euros to 24 billion euros. As the prices of capital goods increased more than the general price level, the real holding loss of non-financial assets of 6 billion euros in 2007 was followed by a real holding gain of 13 billion euros in 2008. However, the modest rise in the general price level was also responsible for a drastic decrease in the real holding gain on liabilities to creditors: from 19 billion euros in 2007 to 8 billion euros in 2008. The real holding loss on shares and other equity increased from 219 billion euros to 261 billion euros.

Despite modest relative price changes, the real holding gains were quite substantial if we compare them with consumption of fixed capital and property income. In 2008, they compensated for about 20% the costs of consumption of fixed capital; they were nearly as big as property income receivable and compensated about 25% of the actual interest payments. In 2007, the compensation of the interest payments amounted even to 80%.

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<sup>70</sup> The general price level is defined as the price index for final national uses excluding changes in inventories.

### *The balance sheet*

The balance sheet describes the stocks of assets and liabilities. Assets and liabilities are valued at the market prices prevailing on the date to which the balance sheet relates. The balancing item is net worth.

The balance sheet shows the stocks at the beginning and end of the accounting period and also their changes. The causes of these changes are described by the accumulation account. Two types of causes should be distinguished:

- Flows changing only the composition of assets and liabilities.
- Flows changing also net worth;

The flows that do not change net worth are the acquisition of financial and non-financial assets and the incurrence of liabilities. These flows only influence the composition of the assets and liabilities.

Flows also changing net worth are:

- Saving;
- Capital transfers;
- Other volume changes;
- Nominal holding gains and losses.

So, in 2007, the decrease in net worth of 152 billion euros was the result of:

- 39 billion euros increase due to saving;
- 2 billion euros increase due to capital transfers;
- 6 billion euros decrease due to other volume changes on non-financial assets;
- 1 billion euros increase due to other volume changes on financial assets;
- 1 billion euros decrease due to other volume changes on liabilities to creditors;
- 21 billion euros increase due to nominal holding gains on non-financial assets;
- 24 billion euros increase due to nominal holding gains on financial assets;
- 232 decrease due to nominal holding losses on shares and other equity.

### *Supplementary concept: net worth to the owners*

Net worth is a balancing item resulting after deducting the market value of shares and other equity. As a consequence, it does not correspond to the equity shareholders' interest ('capital and reserves') in the business accounts. The equity shareholders' interest plays a central role in indicators on the performance of corporations (see Lewis and Pendrill, 1985, pp. 692-703). The return on capital (profitability) is often defined as the ratio of profit available to equity shareholders and equity shareholders' interest. The longer term solvency of a corporation can be defined as the ratio of debt and the total of financial capital invested, i.e. the sum of debt and equity shareholders' interest.

A national accounts counterpart to equity shareholders' interest can be derived by simply ignoring shares and other equity as a liability. The resulting balancing item can be labelled as net worth to the owners. It is shown as a memorandum item in the balance sheet.

Like change in net worth, change in net worth to the owners can also be decomposed in four causes for change. These causes are identical to those for the standard concept of net worth: saving, capital transfers, other volume changes and nominal holding gains. The only difference is that the other volume changes and nominal holding gains do not pertain to shares and other equity.

### *Supplementary concept and table: entrepreneurial income after tax*

The balancing items in the current account, like operating surplus and disposable income, do not correspond to the business accounts' concept of profit before tax. The standard national accounts resolve this by splitting the allocation of primary income account into two accounts: an entrepreneurial income account and an allocation of other primary income account. The entrepreneurial income account shows how entrepreneurial income is derived as the balancing item of the resources operating surplus and property income receivable and the uses interest and rent payable. The other primary incomes receivable, i.e. dividends and reinvested

earnings on direct foreign investment are recorded in the allocation of other primary income account.

Introducing an extra account solely for deriving an extra balancing item further complicates the accounting system. A simpler solution is to draw up a separate table for deriving entrepreneurial income. This table can then also be used to derive a national accounts' counterpart to tax after profit (entrepreneurial income after tax). Such a table is table 6.3d.

*Supplementary table: key-figures for non-financial corporations*

The current account, the accumulation account, the balance sheet and the table on entrepreneurial income in the standard national accounts describe the flows and stocks of non-financial corporations only in current prices. This description of the role of non-financial corporations should therefore be supplemented by a table containing prices, volumes and key ratios of non-financial corporations. Table 6.3e shows nine price-changes, ten volume indicators and twelve key ratios.

*Supplementary prices, volumes and real values*

Six of the price-changes selected refer to output and the various types of production costs: intermediate consumption, consumption of fixed capital (capital formation) and compensation of employees. They can show e.g. that output prices have increased faster than the prices of the production costs.

The general price-change of goods and services and the long-term interest rate are also shown. This puts the price-changes for non-financial corporations in a macro-economic perspective. The general price change is also used for calculating neutral and real holding gains and changes in real net worth. The long-term nominal and real interest rates can be used to compare with alternative measures of return on capital.

The ten volume-indicators consist of three different types of volumes:

- Five weighted volumes on output and the various types of production costs;
- Three unweighted volumes: the level, absolute and relative change in the volume of labour;
- One ratio of volumes: labour productivity change.
- One value expressed in purchasing power: real change in net worth to the owners.

Employment in full-time equivalents and number of hours worked are volumes underlying compensation of employees. For productivity measurement, number of hours worked is the best measure. For analysis of employment, several volume measures should be used simultaneously: number of hours worked, employment in full-time equivalents and number of jobs are then all relevant.

The current account has shown the relative changes in value of the various flows, stocks and balancing items. This applies also to those in the production and generation of income account. The table on prices, volumes and key-ratios shows how these value changes have been broken down into a price-change and a volume-change. For example, in 2008, the value change of output was 4%. This consisted of a price change of 1% and a volume change of 3%.

Net value added at basic prices is the balancing item of output, intermediate consumption and consumption of fixed capital. The volume change of net value added is defined similarly, i.e. as the balancing item of volume changes of output, intermediate consumption and consumption of fixed capital, each weighted by their relative size. The volume change of net value added is calculated most easily by first calculating value added in constant prices (see also section 6.8).

The information on the volume changes of value added and labour can be used to obtain a simple measure for change in labour productivity. It is a very rude measure of productivity as it does not distinguish different qualities of labour (e.g. high-skilled and low-skilled) and ignores changes in efficiency due to substitution between labour and capital or between labour and intermediate inputs (e.g. people working via temporary agencies or ancillary activities like cleaning contracted out).

*Supplementary concept: real change of net worth to the owners*

From an analytical point of view, nominal holding gains may be misleading as they do not show the change in purchasing power. The standard national accounts therefore include also real holding gains. The same analytical defect applies to change in net worth and change in net worth to the owners. In our Polderland-tables this has been resolved by introducing the supplementary concept real change in net worth to the owners.

Real change in net worth to the owners is obtained by correcting the four causes for change for changes in the general price level, i.e. it is equal to the sum of:

- saving deflated by the change in general price level;
- capital transfers deflated by the change in general price level;
- other change in volume deflated by the change in general price level;
- real holding gains on financial and non-financial assets and liabilities to creditors.

*Defining prices, volumes and real values*

For a proper understanding of these price- and volume-measures the underlying principles should be clarified, in particular how are prices and volume defined and what weighting schemes are applied for obtaining aggregates for the sector non-financial corporations or for the national economy.

The values of a great deal of the flows and stocks recorded in the national accounts can be decomposed meaningfully in a price and a volume. This is another important identity in the accounting framework:  $\text{value} = \text{price} \times \text{volume}$ . This identity pertains in particular to the supply and use of products (e.g. output and final consumption expenditure), consumption of fixed capital, taxes and subsidies on products and compensation of employees. For example, compensation of employees can be decomposed into the number of employees and their average compensation. Similarly, output of air transport services can be decomposed into a volume measure of these services (e.g. the number of people transported) and an average price (e.g. the average price paid by these people).

Volumes in the national accounts may refer to readily observable volumes like the number of inhabitants, the number of employees and the number of people receiving social assistance.

However, more often, volume is a composite variable obtained by weighting its components, i.e. by using an index formulae. This applies at the most aggregate level of the national economy, e.g. in calculating the volume of final consumption expenditure. It is evident that this volume can only be obtained by adding up apples, pears, refrigerators, etc. However, it also applies at a rather disaggregate level. For example, the volume of output in one product group, like air transport services, can pertain to rather heterogeneous types of services, as they may differ substantially with respect to, e.g.:

- what is transported: persons or freight, and the type of freight;
- the distance of transport;
- the comfort offered in the plane;
- the time of the day, the day of the week or the period in the year;
- the speed of the plane.

In the standard national accounts, differences in market prices per product are mainly regarded as differences in quality and not as differences in price. For example, the difference in price between a luxury car of 50.000 euros and an ordinary car costing 10.000 euros is regarded as a difference in quality. Similarly, changes in market prices due to changes in the composition of the sales, from ordinary cars to more luxury cars, are regarded as changes in volume and not as changes in price.

Only differences in market prices due to a lack of information, price discrimination or the existence of parallel markets should be regarded as differences in prices and not as differences in quality/volume.

When these exceptions do not occur, also a converse statement holds: differences in quality that are not reflected by differences in market prices are not treated as differences in quality. This may apply to the quality "a large choice for consumers". For example, suppose a car-company widens its colour range for ordinary cars without changing its prices. In this

case, no increase in quality will be registered by national accounts figures. Similar examples can be given for choice in many other products, e.g. bread, cloths and dwellings

By dividing values by volumes also some important and meaningful ratios other than prices in a strict sense can be obtained. For example, by dividing value added by the volume of labour, a measure of labour productivity is obtained. Similarly, by dividing National income by the number of inhabitants, National income per capita is obtained.

The supply and use-tables contain in substantial detail most of the flows of which the values can be decomposed in a price and volume. It is therefore the natural framework for calculating, presenting and analysing such figures. It is discussed in section 6.8.

In general, balancing items can not meaningfully be decomposed into a price and a volume. Exceptions only occur when the value of the balancing item can be readily decomposed into the price- and volume changes of its constituent elements. The major case in point of such an exception is value added (Domestic Product). It can be decomposed in a price and volume by decomposing the values of output, intermediate consumption and consumption of fixed capital in a price and volume. This is called the double-deflation method of value added. Another case in point is net exports, i.e. the balance of imports and exports.

In all such instances, the data compiler and users should readily be aware of the mixed nature of the price and volume of the balancing item. For example, it may even occur that value added in current prices is positive and in constant prices negative. Such an extreme result can occur when prices of major inputs or outputs change drastically and massive substitution with other inputs or outputs takes place.

For analysis and policy, the values of some flows, stocks and balancing items could be translated into real concepts, i.e. corrected for changes or differences in purchasing power. The most important examples of such real concepts are real value added (/Domestic Product), real compensation of employees, real mixed income, real social assistance benefits, real balance of primary incomes (/National Income), real disposable income and real net worth. The correction should be made by using the prices of a reference basket of goods and services, e.g. final consumption expenditure of households or gross domestic final expenditure (gross capital formation, final consumption expenditure and net exports). Real concepts can be calculated both for comparisons over time and over space (e.g. comparison of National Income per capita or value added per employee of two countries).

### *Supplementary key ratios*

Twelve key ratios have been distinguished in table 6.3e. They fall into four groups:

- Four ratios describing *labour productivity* for non-financial corporations;
- Four ratios on the *return on capital* for non-financial corporations;
- Two ratios on the longer term *solvency* of non-financial corporations;
- Two ratios on *relative importance* of non-financial corporations for the national economy.

The four ratios on production per employee provide insights in the *productivity and cost-structure* of the non-financial corporations. For the non-financial corporations in Polderland, the revenues from output are 134 euros per employee in 2007. Value added is less than a third. This implies that more than two-third of these revenues are used for intermediate consumption and capital consumption. Value added consists mainly of compensation of employees and operating surplus. Compensation of employees is about 35 euros per employee, while the resulting operating surplus is 15 euros per employee.

The four ratios in terms of net worth to the owner are alternative *rates of return*. They can also be compared with the long-term interest rate. The Polderland statistics show that the four rates of return (entrepreneurial income before tax and entrepreneurial income after tax and nominal and real change in net worth to the owner) can deviate substantially in level and development. For example, in 2007 the rate of return in terms of entrepreneurial income after tax was 6,3%, while it was 7,5% in terms of the nominal change in net worth to the owner and 8,7% in terms of entrepreneurial income before tax. These three nominal rates of return are all substantially higher in 2007 than the nominal long term interest rate (5.2%). The return

in terms of real change in net worth (5.1%) is also substantially higher than the real long term interest rate (3.0%).

The longer term *solvency* of a corporation is defined as the ratio of liabilities to creditors and the total of financial capital invested, i.e. the sum of liabilities to creditors and the net worth to the owners. The higher this ratio, the greater is the proportion of the assets financed by non-equity capital and hence the greater is the risk of debt holders suffering a loss in case of liquidation. In addition the higher this ratio is, the greater is the potential volatility of the earnings stream attributable to the equity shareholders. In the long run, ratios of over 100% indicate bankruptcy. In Polderland, the solvency ratio for non-financial corporations was 34% in the beginning of 2007 ( $= 610/(610+1160)$ ) and increased to 36% at the end of 2008.

The two ratios in terms of the national economy indicate the *relative importance* of non-financial corporations to the national economy. In Polderland, the non-financial corporations employ 60% of the domestic employment and are responsible for 58% of the Domestic Product.

### 6.3.2 Discussion

This section discusses the relevance of the national accounts' description of non-financial corporations. This relevance will be investigated in three ways.

First, the sector non-financial corporations and its subsectors are compared with some alternative classifications. This clarifies how logical or arbitrary the sector non-financial corporations is. This can be regarded as a first test on relevance.

The second way of testing the relevance is to make a comparison with business accounts. Substantial and arbitrary differences will indicate that the link with individual business accounts has become diffuse and obscure. This distortion of the micro-macro link makes the national accounts concepts less useful for understanding the behaviour of a group of individual companies, i.e. the sector non-financial corporations. Furthermore, the reliability of national accounts statistics on non-financial corporations will be at stake, as the business accounts are less suitable as a data source. Finally, the various users of business accounts, like managers, investors, financial analysts and banks, may regard the national accounts statistics as incomprehensible and irrelevant for their work.

The third way the relevance of the national accounts statistics on non-financial corporations will be tested is by comparison with some economic theoretic notions, like expected net present value, market prices and factors of production.

#### *The logic of the sector non-financial corporations*

The sector non-financial corporations is a grouping of units by similarity of economic and financial behaviour. Three subsectors are distinguished:

1. public non-financial corporations;
2. national private non-financial corporations;
3. foreign controlled non-financial corporations.

It is a pity that the role of multinationals has not been dealt with systematically in this subsectoring. By distinguishing foreign controlled non-financial corporations the influence of foreign multinationals can be analysed. However, the standard subsectoring does not make a similar distinction for the national multinationals. Their corporations are likely to behave differently, as a lot of their transactions with the rest of the world are intra-firm transactions and may involve e.g. transfer pricing and reinvested earnings on direct foreign investment. The role of national multinationals can be shown by splitting the subsector national private non-financial corporations into two subsectors: private non-financial corporations controlled by national multinationals and independent private non-financial corporations.

However, at least four alternative types of subsectoring can also be relevant for analysis. A first alternative is to distinguish real corporations versus quasi-corporations and non-profit institutions, as they are quite different in economic and financial behaviour. For example, transforming a public quasi-corporation into a real corporation can reflect a decreased



interference by politicians, a change in management strategy towards maximising profits, a reduction of annual subsidies and a change in tax regime, e.g. by becoming liable to income tax. Furthermore, for analysing the role of the government in an administrative sense, quasi-corporations of the government should be regarded as part of the government. Finally, there may be substantial differences in the type of data available, e.g. due to different reporting requirements.

A second alternative subsectoring is to distinguish small versus big corporations. This distinction is e.g. important in studying the economics of scale or studying different management styles related to scale. However, in practice the distinction could overlap to a great extent with a classification showing systematically the role of multinationals (see above).

A third alternative subsectoring is to distinguish corporations whose equity is traded on the stock exchange or not. This distinction is important in making links to stock exchange rates.

A fourth alternative subsectoring is to classify non-financial corporations by industry, e.g. a hospital is fundamentally different from a railway-company. A very broad classification by industry (e.g. five or ten groups) would already be very meaningful. It serves two purposes. Firstly, developments in non-financial corporations are linked in a rough way to developments in goods and services markets and the ratio's on rate of return, production costs and solvency would become much more meaningful. Secondly, the important link between the descriptions of the role of non-financial corporations and the role of industries becomes much clearer.

#### *National accounts and business accounts*

National accounts and business accounts have much in common. This is not surprising, as the development of the national accounts has been inspired by the business accounts. The national accounts can even be regarded as the business accounts of the national economy.

An important common characteristic is the principle of double-entry bookkeeping. Business accounts usually present two tables: a profit and loss account and a balance sheet. The profit and loss account is used to explain the changes in the assets and liabilities recording in the balance sheet. This is the principle of double-entry bookkeeping: not only the changes in the assets and liabilities are recorded, but also the flows causing these changes are recorded.

Furthermore, many broadly similar concepts can be found in the business accounts. Examples are wages, capital formation, depreciation, subsidies, assets and liabilities. Sometimes even the terminology is identical. However, there are also important differences with the business accounts.

A first important difference is that the *concepts used in the standard national accounts are much more standardised* than those in the business accounts. Concepts in the business accounts should meet a country's generally accepted accounting principles. However, all over the world, these principles are not very strict, as they permit the use of different concepts in the business accounts of different companies and even allow changes from one year to another in the accounting principles used by one company. Furthermore, there are differences between the accounting principles of different countries. For many years, for multinationals whose stock is traded at the US-stock market stricter rules applied. These were not sufficient to avoid the recent bookkeeping scandals (e.g. Enron and Albert Heijn). As a consequence, the rules have been made more strict. Furthermore, these rules do not apply to companies not notified at the US-stock exchange. This lack of national and international standardization contrasts with the concepts in the national accounts. There are universal guidelines on national accounting, which are now being applied all over the world. These guidelines are also much stricter than the generally accepted accounting principles (e.g. with respect to the concepts of capital formation and capital consumption) and they will probably remain unchanged for decades.

A second difference is that the *standard national accounts distinguish many more accounts and balancing items than the business accounts*. In the business accounts, the profit

and loss account describes why the assets and liabilities have changed in value and composition. In the national accounts, seven different accounts are used for this purpose: a production account, three income accounts, a capital account, a financial account and an other changes in assets account. In the business accounts, attention is focused on the income, assets and liabilities of the company. In the national accounts, also the links with other parts of the national economy are important. For example, value added is very important, as it reflects the income generated for all parties involved in production<sup>71</sup>. Similarly, in order to properly record the redistribution of income, the casualty insurance premiums paid by companies are split into a service charge and a transfer. The latter is regarded by the national accounts as a redistribution of income between all the insured.

A third important difference is that *the balancing items on the income of non-financial corporations are defined fundamentally different*.

In the business accounts, a distinction is often made between profit (or loss) on ordinary activities, extraordinary profit and total profit that includes both types of profit. We can compare these three balancing items with the seemingly similar balancing items in the standard national accounts, i.e. net operating surplus, entrepreneurial income and disposable income.

In business accounts, ordinary holding gains and losses will be included in profit on ordinary activities. Extraordinary holding gains and losses and damage due to extraordinary disasters are likely to be recorded as extraordinary profit or loss and thus included in total profit. Investment grants could have been recorded in several different ways, e.g. as extraordinary benefits, as deductions to the value of the fixed assets or as annual benefits during the lifetime of the fixed assets.

In the standard national accounts, holding gains and losses are not recorded in the current accounts but in the accumulation accounts. The same applies to investment grants and damage due to extraordinary disasters like major earthquakes, acts of war and major toxic spills. As a consequence, all these items are not taken into account in calculating net operating surplus, entrepreneurial income and disposable income<sup>72</sup>.

An important concept in the business accounts is also profit after tax. No similar concept can be found in the national accounts, as the accounting structure of the national accounts does not allow constructing such a balancing item. Profit after tax assumes that taxes have already been paid, while dividends are still to be paid. However, in the national accounts, first all primary incomes including dividends are allocated and then current taxes on income, wealth etc. are paid out.

A fourth difference is that *concepts* that seem to be similar at first sight *can nevertheless differ substantially*. These differences pertain to the *delimitation, valuation and time of recording of the concepts*.

Important *differences in delimitation* occur usually for the twin concepts capital formation and capital consumption<sup>73</sup>. In both the business accounts and the national accounts, capital formation includes the purchase of assets like buildings, machinery and equipment, mineral exploration, computer software, subsoil assets, patents and purchased goodwill. However, in the business accounts, also costs of huge reorganisations, massive marketing campaigns (e.g. the launching of a new brand) and large-scale training-programmes for employees are not recorded as capital formation but as current expenditure. Furthermore, although purchased goodwill and patents are recorded as capital formation in the national

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<sup>71</sup> It is sometimes recommended by accounting bodies that corporations publish also a value added statement as part of their annual accounts. This is in line with current organisational theories that regard the corporation as "being operated by and for the benefit of a team of interests. Such a team is usually taken to include employees, supplies of long-term capital and the government but to exclude other firms which supply goods and services. Thus, whereas the profit and loss account has traditionally shown the profit or loss of a period from the point of view of the equity shareholders, the value added statements shows the income of the larger entity and how this has been divided between the wider team of contributors" (Lewis and Pendrill, 1985, p. 552.)

<sup>72</sup> They are only taken into account in the balancing item of the balance sheet, i.e. change in net worth.

<sup>73</sup> Another common example is the delimitation between intermediate consumption and compensation of employees/labour costs, e.g. child-care provided free or at reduced rates or the costs of training.

accounts, no capital consumption is recorded on these assets<sup>74</sup>. So, in the national accounts the concepts of capital formation and capital consumption are generally less encompassing than those in the business accounts.

The differences in accounting structure cause also differences in delimitation of the concepts used in the accounts. The accounting structure of the *national accounts is more detailed and analytic*. This implies that the national accounting concepts require *splitting and imputations* of money-flows.

As we saw above, casualty insurance premiums are an example of splitting by the standard national accounts: the premium actually paid by a company should be split in a service charge and a transfer (i.e. the net premium).

The treatment of unfunded social benefits for employees is an example of an imputation. Like funded social benefits, they are first recorded as part of the compensation of employees. However, in order to explicitly show them as a redistribution of income, they are also recorded as imputed social contributions (current transfers receivable) and unfunded social benefits (current transfers payable) in the secondary distribution of income account. This increases the resources and uses by the same amount and does not influence any balancing items.

The reinvested earnings on direct foreign investment by a company are another example of an imputation. These earnings are not actually distributed to the owners. However, they are recorded as if they are distributed and then reinvested, i.e. as property income receivable and the purchase of the equity of the direct foreign investment enterprise.

*Differences in valuation* pertain most commonly to trading stocks, fixed assets and the corresponding capital consumption. In business accounts, valuation at historic costs (FIFO or LIFO) is often used. In the national accounts, all flows and stocks should be valued at current exchange values. Capital stock and capital consumption should be calculated by means of the Perpetual Inventory Method (PIM), i.e. by adding the capital formation of the various years while taking account of changes in prices of the assets and the expected lifetimes. From the point of view of the national accounts, this method is very practical, ensures consistency of the concepts used for different companies and provides comparability over time in line with general changes in prices of the various non-financial assets. A specific difference is that the national accounts includes in principle the revenues from all activities, even if they are illegal or otherwise not reported at tax, social security and other public authorities.

*Differences in the time of recording* can pertain to nearly all of the concepts. In the national accounts, the calendar year is often used. In business accounts, the book-year may not coincide with the calendar year. Furthermore, in the national accounts all flows and stocks are in principle recorded on an accrual basis. In business accounts, various times of recording may be used, e.g. cash or a different accrual basis. In business accounts, also provisions can be made against expected claims or losses.

Our comparison with the business accounts has revealed four types of differences:

1. The national accounts are much more standardised among sectors, internationally and over time.
2. The national accounts distinguish many more accounts and balancing items.
3. The standard national accounts do not have concepts that correspond to profit-after-tax and equity shareholders' interest in the business accounts.
4. The concepts in the national accounts differ substantially with respect to delimitation, valuation and time of recording.

#### *Differences in purposes*

These differences reflect to a great extent *two differences in purposes*. The first difference pertains to the need to *standardisation*. Standardisation of the national accounting concepts is essential for obtaining meaningful and comparable totals on non-financial corporations. Standardisation allows looking through the veil of different accounting practices by

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<sup>74</sup> An exception is made for the costs of ownership transfer: these are included in capital formation and are also included in capital consumption.

companies. It therefore contributes substantially to the relevance of national accounts statistics. In fact, standardisation is also a trend in business accounting. This trend is stimulated by the globalisation and unification in Europe and elsewhere.

There is also a risk in the long run, as standardisation may hinder experimentation and progress (Prof. Baxter, see p. 33 in Lewis and Pendrill, 1985). However, for most data users of the national accounts, the advantages of standardisation are certain and enormous, while this risk may be minimised and will be regarded as of secondary importance.

The second difference is that the *purpose of the national accounts is to describe corporations as part of a consistent description of the national economy*; this is no purpose of the business accounts<sup>75</sup>. This specific purpose of the national accounts has the advantage that statistics on non-financial corporations can be linked to statistics on the rest of the national economy (e.g. for calculating interactions), that national totals can be obtained starting from totals per sector and that some of the totals per sector can be derived starting from national totals.

However, describing corporations as a fully consistent part of the national economy has also clear disadvantages. From the point of view of data users mainly interested in the development of non-financial corporations as such, the standard national accounts description contains an excessive number of accounts, is not very comprehensible and contains sub-optimal concepts. This is mainly due to the consistency required for describing the whole national economy. Cases in point are the splitting of casualty insurance premiums, the treatment of unfunded social benefits and the income concepts. It applies even to a great extent to the differences with respect to capital formation.

In the national accounts, capital formation is part of the supply and use of goods and services. This implies that when the purchase of a patent or goodwill is recorded as capital formation, it should first have been recorded as production of goods and services. However, know-how is often patented long after it has been produced and the amount of goodwill is only explicitly known when a company is sold and not when the goodwill has been built up. So, in order to have a meaningful and operational concept of output, capital formation in the national accounts can not include patents and goodwill. In drawing up the business accounts for one company, there are not any of such conceptual limitations.

#### *Supplementary concepts and tables*

The Polderland-tables illustrate how the standard national accounts can be made more comprehensible and relevant for data users mainly interested in the development of non-financial corporations as such. Specific features of these tables are<sup>76</sup>:

- Only the major accounts are distinguished, e.g. a supplementary account like the entrepreneurial income account is not shown.
- Only the major types of flows and stocks are shown; detail is only provided where it is highly relevant and quantitatively important for non-financial corporations.
- Prices and volumes on the production process, like changes in output-prices and labour productivity, are shown in a supplementary table;
- Key-ratio's based on standard concepts, like production costs per employee, are shown in a supplementary table;
- Counterparts to the business accounts' concepts profit before and after tax are derived in an ad hoc way and shown a supplementary table.
- The counterpart to equity shareholders' interest in the business accounts is shown as a memorandum item in the balance sheet (net worth to the owners).
- Key-ratios on the return on capital and solvency are also shown in a supplementary table. These ratios have been obtained from the supplementary concepts.

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<sup>75</sup> The difference in purpose can also be translated into bookkeeping terms: business accounts is double-entry bookkeeping, while the national accounts is based on quadruple-entry bookkeeping, i.e. all transactions are also recorded in the accounts of the other actors involved.

<sup>76</sup> A more radical proposal would be to distinguish only one simple transactions account. All balancing items could then be presented separately together with key ratios.

National accounts figures on entrepreneurial income can be used for estimating and forecasting corporation tax revenue. However, for this purpose, corrections should be made for the major conceptual differences between entrepreneurial income and the national concept of taxable profit. For example, consumption of fixed capital in the national accounts is usually different from consumption of fixed capital according to the tax authorities, e.g. based on different life-times and different valuation principles.

#### *National accounts and economic theory*

Comparison with economic theoretic concepts reveals to what extent the standard national accounts are inspired and influenced by economic theory. It can also shed light on the relevance of the standard national accounts in general, and for economic theory in particular.

The national accounts and business accounts are examples of ex post accounting. They pay no attention to recording expectations (ex ante). As a consequence, concepts like net present value, risk and uncertainty which play such an important role in economic theorising are fully ignored.

The general principle of valuation in the national accounts is the current exchange value, i.e. “the values at which goods and other assets, services, labour or the provision of capital are in fact exchanged or else could be exchanged for cash (currency or transferable deposits)” (SNA93, paragraph 3.70). There are three supplementary principles of valuation:

1. prices of similar items exchanged for cash elsewhere;
2. production costs;
3. net present value.

Net present value is the least preferred of the three supplementary principles of valuation. It is therefore only applied when the other valuation principles are not applicable. This applies for example to the valuation of natural assets, e.g. the stock of oil reserves.

According to the national accounts, the value of a non-financial corporation is equal to the net worth of the assets and liabilities at their current exchange value. However, according to the net present value approach, the value of a non-financial corporation is the present value of the expected net cash flows that will be generated in the future.

There are many reasons why the net present value approach is generally not suitable for the national accounts (see Bos, 1997, pp. 178-179):

- The net present value can only be used to value a projector an asset with a distinct stream of revenues and costs. The net present value can not be used to value non-financial assets that are only one of the inputs of a production process.
- The value is speculative, as it depends on the discounting rate used and on the assumptions made about expected revenues and costs. A different discount rate and different assumptions may result in quite different values.
- If the net present value is regarded as an approximation to the market value, it is likely to be an overestimate of the market value. A market price will in general not coincide with the maximum a risk-averse buyer wants to pay, but it will be lower, i.e. somewhere between the buyer’s maximum price and the minimum the seller want to receive for the asset.
- Up-to date and precise estimates of net present value are often not used by enterprises and households for deciding on projects (investments/purchase of assets), e.g. because of substantial uncertainty.
- The net present value is not very interesting for comparisons over time, because changes over time in this value can be very volatile and will reflect no more than expectations on interest rates, relative prices, market power, etc. The net present value describes the expected future and does not describe what really has happened.
- The net present value is not well-defined, because it is not clear which revenues and expenditure should be discounted. From the point of view of enterprises and households, their net present value should also take account of expected holding gains and the fiscal treatment of revenues. This applies for example to the net present value of natural resources and equity.

- Net present values are ex ante values and therefore likely to be inconsistent, e.g. based on an inconsistent set of expectations of the various parties involved. Only ex post values like the current exchange value achieve the consistency required by the national accounts.
- The valuation of assets at net present value does not really fit in a national accounting system mainly based on current exchange values. Valuation of assets at net present value is a forward-looking concept of capital stock. It should therefore be accompanied by a forward-looking concept of income.

Marginal costs and marginal revenues play an important role in economic theory but are entirely absent in the national accounts. The standard national accounts are focused on totals and averages. As a consequence, they provide only information on total costs, total revenues and derived averages.

In calculating balancing items like entrepreneurial income, market values that pertain to different times and places are added up and subtracted. From the point of view of standard economic theory, the consistency of this type of aggregation is to be doubted. For example, to what extent does it make sense to add up all the values for a particular transaction during a year, while we know that -from a cash-flow point of view- values should be discounted for differences in time? A similar remark applies to differences in space, as also distance is often not without a price tag. In a strict sense, addition is only allowed for fully homogeneous transactions, which means that they pertain to the same time and place.

Neo-classical theory is fully expressed in real terms as it assumes that economic actors do not suffer from money illusion. However, in the standard national accounts, the sector accounts of non-financial corporations and other sectors are mainly in nominal terms. The only exception pertains to the holding gains: the nominal holding gains are split into real and neutral holding gains. In the Polderland-tables, the sector accounts of non-financial corporations are accommodated with a table on prices and volumes. In this way, the real developments of the non-financial corporations are also shown.

The Polderland-tables introduce also the concept real change in net worth to the owners. It can be regarded as the national accounts' closest equivalent of Hicksian income, i.e. "the maximum value which [a person] ... can consume ... and still expect to be as well-off at the end of the [period] as he was at the beginning" (Hicks, 1946, p. 172).

There is a long tradition in economic thought of distinguishing between different factors of production and corresponding factor incomes, e.g. in specifying production functions. Such a traditional distinction by type of factor income could be pure profit, wages, interest and land rent (Pen, 1971, p. 163). This distinction is in several respects different from the types of primary income distinguished in the standard national accounts. Firstly, entrepreneurial income does not correspond to "pure" profit as it includes also a remuneration for the money invested. Secondly, in addition to land rent, also rent on subsoil-assets is regarded as rent. Thirdly, value added at basic prices includes other taxes on production, like taxes on owning real estate or motor vehicles. This implies that the government receives also part of factor income. Fourthly, the standard national accounts explicitly acknowledge that interest payments should exclude payments for financial intermediation services indirectly measured (as these services are only implicitly charged for). At the national level, a correction is made for this. So, in this respect, the national accounts makes an extra effort to transform the interest payments into a "pure" concept of interest.

From the point of view of human capital theory, expenditure on training and education should be regarded as capital formation. Examples of such expenditure are the fees for management, computer and language courses and the opportunity costs of hours not worked, i.e. the corresponding part of the compensation of employees. However, in the standard national accounts all such expenditure are regarded as current expenditure.

### 6.3.3 Summary

The standard national accounts describe the non-financial corporations in terms of a coherent set of accounts in current prices. This description has much in common with the business accounts, e.g. the presentation in terms of accounts, the use of double-entry bookkeeping and the terminology. Nevertheless, there are also four important differences:

- The national accounts are much more standardised nationally, internationally and over time.
- The national accounts distinguish much more accounts and balancing items.
- The standard national accounts do not have concepts that correspond to profit-after-tax and equity shareholders' interest in the business accounts.
- The concepts in the national accounts differ substantially with respect to delimitation, valuation and time of recording.

These differences reflect to a great extent two differences in purposes. The first difference pertains to the need to standardisation. Standardisation of the national accounting concepts is essential for obtaining meaningful and comparable totals on non-financial corporations. For many years, standardisation of the business accounts seemed less essential. However, the bookkeeping scandals in major multinationals, the capital markets becoming more international and the current financial crisis have changed this. The tightening of the bookkeeping rules for companies registered at the US-stock exchange and other stock markets is therefore probably a first step towards much more standardisation of business accounts, at least for multinationals.

The second difference is that the purpose of the national accounts is to describe corporations as part of a consistent description of the national economy; this is no purpose of the business accounts. However, describing corporations as a fully consistent part of the national economy has also clear disadvantages. From the point of view of data users mainly interested in the development of non-financial corporations as such, the standard national accounts description contains an excessive number of accounts, is not very comprehensible and contains sub-optimal concepts. The latter is evidenced by the income concepts. The income concepts of the business accounts, e.g. profit on ordinary activities, extraordinary profit, total profit and total profit after tax, are much better focused on the data needs of managers, investors, banks and most other third parties.

The only way to remedy this lack of relevance is to present supplementary ad hoc tables. These tables should be simpler, closer to business accounting practice and partly inconsistent with the standard national accounting concepts of the whole system. For example, the national accounts' counterpart of profit after tax can only be defined in an ad hoc way. The various national accounts concepts should be used as building blocks while the accounting structure is disregarded. These ad hoc national accounts concepts differ still in many ways from their business accounts' counterparts. These differences may be bridged by a separate table (satellite) showing the differences, e.g. between the concept of capital formation in the national accounts and the business accounts.

The comparison with economic theoretic concepts indicates that the standard national accounts is a description with some specific theoretical elements, e.g.:

- the notion of price discrimination is used for distinguishing prices and volumes;
- real holding gains is part of the accounting structure;
- reinvested earnings on direct foreign investment is introduced in order to make property income receivable a more meaningful measure of return on investments;
- in some very specific cases, net present value is used as a principle of valuation.

Furthermore, the standard national accounts is in several respects clearly an economic model, e.g. the distinction between financial and non-financial transactions, the distinction between taxes and the purchase of services and the preference for market values. However, the standard national accounts is also in major respects fundamentally different. It generally prefers the current exchange value to the net present value, does not show primary income as a reward for some specific factors of production and focuses on describing non-financial corporations in terms of current prices.

The national accounts description of non-financial corporations is not a direct reflection of what can be readily observed. It transforms what can be readily observed into a well-structured model with accounts and balancing items in current prices and straightforward links to consistently defined prices and volumes. A major part of the variables in this model can in principle be measured directly in monetary terms. However, the balancing items and several specific variables like consumption of fixed capital, reinvested earnings on direct foreign investment and net insurance premiums can only be measured very indirectly. Furthermore, the concepts and classifications used (e.g. the concepts of capital formation and income) are universally applied and independent of the actual behaviour of non-financial corporations. Finally, the sequence of accounts suggests a chronological sequence of successive economic processes (first production, then generation of income, etc.). However, in reality these processes interact and do not follow a simple chronological sequence.

The Polderland-tables illustrate how the standard national accounts can be made more comprehensible and more relevant, e.g. by including national accounts counterparts of business accounts' concepts (profit, solvency, rate of return) and by translating the values into prices and volumes. The relevance of the national accounts can be increased further by splitting the sector by some major groups of industry. Without such splitting, the sector is too heterogeneous for most analyses.



## 6.4 Financial corporations

### 6.4.1 Description

#### *Delimitation of financial corporations*

Financial corporations are one of the major groups of economic actors in the national economy. Their principal role is that of producers of financial services, like banking services and insurance. Financial services pertain to financial assets and the income from financial assets, like interest. A characteristic feature of financial corporations is therefore also their principal role in supplying, demanding and rearranging financial assets and corresponding income flows.

The Polderland-statistics can be used to illustrate their importance. Financial corporations are only responsible for about 5% of Domestic Product and 3% of domestic employment. However, their financial assets and liabilities are substantial. For example, the liabilities to other sectors in terms of e.g. currency, deposits, loans and pension reserves are about four times Domestic Product. The property income payable on these liabilities amount to about 20% of Domestic Product.

The sector Financial corporations includes a wide range of units. Examples are banks, pension funds, insurance companies, supervisory authorities of financial intermediaries and financial markets, investment funds, financial leasing corporations, security dealers and pension consultants. These units can be private or public, e.g. a private bank or the Central Bank. Some units can be quasi-corporations. These units are part of the administration of another unit, have no independent legal status but act economically and financially as if they were 'real' corporations. This can apply e.g. to a municipal credit bank.

All financial corporations are restricted to the domestic affiliates; foreign branches are regarded as the corporations of other countries. This implies also that the domestic branches of foreign financial corporations are regarded as domestic corporations.

The guidelines recommend employing *two types of subsectoring* for the sector financial corporations. The first type is based on the *criterion control*. It is consistent with the subsectoring used for the sector non-financial corporations:

- public financial corporations;
- national private financial corporations;
- foreign controlled financial corporations.

The second type of subsectoring *looks like an industry-classification*:

- the central bank;
- other monetary financial institutions;
- insurance corporations and pension funds;
- other financial intermediaries;
- and financial auxiliaries.

This subsectoring reflects five different types of financial services:

- central banking services;
- normal banking services;
- insurance and pension funding;
- other financial intermediation services;
- auxiliary financial services.

Each subsector is principally engaged in one of these activities. The principal activity of the central bank is to provide central banking services, i.e. to manage the supply of money by issuing currency, maintaining the internal and external value of the currency and holding the international reserves of the country.

The principal activity of other monetary financial institutions is to provide normal banking services, i.e. intermediation of money received as deposits (or close substitutes). Corporations in this subsector could be e.g. commercial banks, savings banks, post office giro institutions, rural credit banks, co-operative credit banks and merchant banks.

The principal activity of insurance corporations and pension funds is financial intermediation as the consequence of the pooling of risks, i.e. insurance and pension funding. The principal activity of other financial intermediaries is any other type of financial

intermediation, like financial leasing, hire purchase, factoring, personal finance, security dealing and providing venture capital.

Financial auxiliaries are principally engaged in activities closely related to financial intermediation. Examples are insurance brokers, pension consultants, loan brokers, investment advisers, corporations providing stock exchange and central supervisory authorities of financial intermediaries and financial markets.

### *The tables*

The role of financial corporations is described by six tables:

1. a current account;
2. an accumulation account;
3. a balance sheet;
4. a table with entrepreneurial income;
5. a table with prices, volumes and key-ratios;
6. a table on the financial assets of the whole national economy. This table includes a breakdown of the sector financial corporations into monetary financial institutions, insurance and pension funds and other financial corporations.

The first five tables are in many respects similar to those for the non-financial corporations. However, distinctive features of financial corporations are that their services are closely linked to transactions in financial assets and that a great part of these financial services are provided without explicit charge. These distinctive features are reflected in the tables on financial corporations.

In this section, we will focus on the roles played by two characteristic parts of the financial corporations:

- the role of the central bank and other monetary financial institutions;
- and the role of insurance companies and pension funds.

### *The central bank and other monetary financial institutions*

The role of the central bank is to issue currency, to hold the international reserves of the country and to maintain the internal and external value of the currency. By issuing currency, the currency becomes a liability for the central bank and a financial asset for its owners. The balance sheet on financial corporations (table 6.4c) shows currency as a liability of 39 billion euros at the beginning of 2007. This liability is the currency issued by the central bank. Currency is also an asset for financial corporations, e.g. currency held by other monetary financial institutions or foreign currency held by the central bank. However, the amounts involved are so small (about 4 billion euros) that they are not shown separately in the Polderland statistics.

Monetary gold and Special Drawing Rights (SDR's) are shown as financial assets of financial corporations. This reflects the central bank's role in holding the international reserves. They are also an instrument for maintaining the internal and external value of the

Table 6.4a Current account for Financial corporations

	2007	2008	08-07	08/07
I. Production account				
R Output at basic prices	65	70	5	8%
monetary financial institutions	30	33	3	10%
explicitly charged output	10	11	1	10%
FISIM	20	22	2	10%
insurance companies and pension funds	25	26	1	4%
other financial institutions	10	11	1	10%
U Intermediate consumption	27	29	2	7%
Consumption of fixed capital	5	5	0	0%
Net value added at basic prices	33	36	3	9%
II. Income accounts				
II.1.1 Generation of income account				
R Net value added at basic prices	33	36	3	9%
U Compensation of employees	20	22	2	10%
Other taxes on production	1	1	0	0%
Operating surplus	12	13	1	8%
II.1.2 Allocation of primary income account				
R Net operating surplus	12	13	1	8%
Property incomes receiveable	148	159	11	7%
interest	146	156	10	7%
adjustment for FISIM	-20	-22	-2	10%
dividend	17	19	2	12%
reinvested earnings on direct foreign investment	5	6	1	20%
U Property incomes payable	140	154	14	10%
interest	67	75	8	12%
dividends	13	15	2	15%
reinvested earnings on direct foreign investment	0	1	1	
property income of insurance policy-holders	60	63	3	5%
life	11	12	1	9%
pension	47	49	2	4%
other private social and casualty	2	2	0	0%
Balance of primary incomes	20	18	-2	-10%
II.2 Secondary distribution of income account				
R Balance of primary incomes	20	18	-2	-10%
Pension contributions	68	72	4	6%
actual	21	23	2	10%
imputed	47	49	2	4%
Other private social contributions	3	2	-1	-33%
Casualty insurance premiums	22	25	3	14%
actual	20	23	3	15%
imputed	2	2	0	0%
U Pension benefits (funded)	33	35	2	6%
Other private funded social benefits	2	2	0	0%
Casualty insurance claims	22	25	3	14%
Current taxes on income, wealth, etc.	5	5	0	0%
Disposable income	51	50	-1	-2%
Correction for pension fund reserves	35	37	2	6%
Saving	16	13	-3	-19%

Table 6.4b Accumulation account for Financial corporations

	2007	2008	08-07	08/07
III.1. Capital account				
A Gross capital formation	7	8	1	14%
minus: Consumption of fixed capital	-5	-5	0	0%
L Saving	16	13	-3	-19%
Net borrowing	-14	-10	4	-29%
III.2 Financial account				
A Net acquisition of financial assets	250	292	42	17%
monetary gold, SDR's and currency	1	-6	-7	-700%
deposits	-10	-1	9	-90%
security other than shares	104	130	26	25%
loans	147	158	11	7%
shares and other equity	27	35	8	30%
net other accounts receivable	-19	-24	-5	26%
L Net incurrence of liabilities	236	280	44	19%
currency	1	1	0	0%
deposits	89	101	12	13%
security other than shares	38	48	10	26%
loans	46	59	13	28%
shares and other equity	9	12	3	33%
insurance technical reserves	53	59	6	11%
life	17	20	3	18%
pension	35	37	2	6%
other private social and casualty	1	2	1	100%
Net lending	14	12	-2	-14%
III.3 Other changes in assets account				
A Other changes in non-financial assets	2	2	0	0%
Other changes in financial assets	142	159	17	12%
other changes in the volume	1	2	1	100%
nominal holding gains	141	157	16	11%
neutral holding gains	60	22	-38	-63%
real holding gains	81	135	54	67%
L Other changes in liabilities to creditors	2	1	-1	-50%
other changes in the volume	2	1	-1	-50%
nominal holding losses	0	0	0	
neutral holding losses	55	20	-35	-64%
real holding losses	-55	-20	35	-64%
Other changes in shares and other equity	179	194	15	8%
other changes in the volume	0	0	0	
nominal holding losses	179	194	15	8%
neutral holding losses	6	2	-4	-67%
real holding losses	173	192	19	11%
Changes in net worth due to other changes	-37	-34	3	-8%

Table 6.4c Balance sheets for Financial corporations

	2007	2008	08-07	08/07
IV.1 Opening balance sheet				
A Non-financial assets	105	109	4	4%
Financial assets	2716	3108	392	14%
monetary gold, SDR's and currency	44	45	1	2%
deposits	269	259	-10	-4%
security other than shares	537	641	104	19%
loans	1364	1512	148	11%
shares and other equity	505	673	168	33%
net other accounts receivable	-3	-22	-19	633%
L Liabilities	2767	3184	417	15%
currency	39	40	1	3%
deposits	856	945	89	10%
security other than shares	198	602	404	204%
loans	288	334	46	16%
shares and other equity	414	602	188	45%
insurance technical reserves	972	1027	55	6%
life	158	175	17	11%
pension	780	817	37	5%
other private social and casualty	34	35	1	3%
Net worth	54	33	-21	-39%
<i>P.M. Net worth to owners</i>	<i>468</i>	<i>635</i>	<i>167</i>	<i>36%</i>
IV.2 Changes in balance sheet				
A Changes in non-financial assets	4	1	-3	-75%
Changes in financial assets	392	451	59	15%
monetary gold, SDR's and currency	1	-6	-7	-700%
deposits	-10	-1	9	-90%
security other than shares	104	130	26	25%
loans	148	160	12	8%
shares and other equity	168	192	24	14%
net other accounts receivable	-19	-24	-5	26%
L Changes in liabilities	417	475	58	14%
currency	1	1	0	0%
deposits	89	101	12	13%
security other than shares	38	48	10	26%
loans	46	59	13	28%
shares and other equity	188	206	18	10%
insurance technical reserves	55	60	5	9%
life	17	20	3	18%
pension	37	38	1	3%
other private social and casualty	1	2	1	100%
Changes in net worth	-21	-23	-2	10%
<i>P.M. Change in Net worth to owners</i>	<i>167</i>	<i>183</i>	<i>16</i>	<i>10%</i>

Table 6.4c Balance sheets for Financial corporations (continued)

	2007	2008	08-07	08/07
IV.3 Closing balance sheet				
A Non-financial assets	109	110	1	1%
Financial assets	3108	3559	451	15%
monetary gold, SDR's and currency	45	39	-6	-13%
deposits	259	258	-1	0%
security other than shares	641	771	130	20%
loans	1512	1672	160	11%
shares and other equity	673	865	192	29%
net other accounts receivable	-22	-46	-24	109%
L Liabilities	3184	3659	475	15%
currency	40	41	1	3%
deposits	945	1046	101	11%
security other than shares	602	808	206	34%
loans	334	393	59	18%
shares and other equity	602	808	206	34%
insurance technical reserves	1027	1087	60	6%
life	175	195	20	11%
pension	817	855	38	5%
other private social and casualty	35	37	2	6%
Net worth	33	10	-23	-70%
<i>P.M. Net worth to owners</i>	<i>635</i>	<i>818</i>	<i>183</i>	<i>29%</i>

Table 6.4d Entrepreneurial income of financ. corp. before and after tax (supplementary table)

	2007	2008	08-07	08/07
Operating surplus	12	13	1	8%
plus: Interest receiveable	146	156	10	7%
minus: Adjustment for FISIM	-20	-22	-2	10%
plus: Dividends receiveable	17	19	2	12%
plus: Reinvested earnings on direct investment receiveable	5	6	1	20%
minus: Interest payable	-67	-75	-8	12%
minus: Property income of insurance policy holders	-60	-63	-3	5%
Entrepreneurial income before tax	33	34	1	3%
minus: Current taxes on income and wealth	-5	-5	0	0%
Entrepreneurial income after tax	28	29	1	4%
minus: Dividends payable	-13	-15	-2	15%
minus: Reinvested earnings on direct foreign investment payable	0	-1	-1	
minus: Gross capital formation	-7	-8	-1	14%
minus: Acquisition of other non-financial assets	-16	-13	3	-19%
plus: Consumption of fixed capital	5	5	0	0%
plus: Other income and capital transfers receiveable	95	102	7	7%
minus: Correction for pension fund reserves	-35	-37	-2	6%
minus: Other income and capital transfers payable	-59	-63	-4	7%
Net lending	-2	-1	1	-50%

Table 6.4e Prices, volumes and key-ratios for financial corporations (supplementary table)

	2007	2008
Price-changes		
1 Output	2.4%	3.0%
2 Intermediate consumption	2.1%	2.0%
3 Consumption of fixed capital	1.8%	1.7%
4 Value added	2.0%	2.1%
5 Capital formation	1.7%	1.7%
6 Compensation of employees (price per hour worked)	2.1%	2.6%
7 General price-change of goods and services	2.2%	0.7%
8 Nominal interest rate (long term)	5.2%	4.4%
9 Real interest rate (long term)	3.0%	3.7%
Volumes		
1 Output (% change)	5.4%	5.6%
2 Intermediate consumption (%change)	14.7%	8.0%
3 Consumption of fixed capital	9.4%	-1.7%
4 Value added (% change)	4.4%	2.2%
5 Capital formation	25.0%	12.6%
6 Volume of labour (% change)	3.5%	5.0%
7 Volume of labour (abs. change)	0.01	0.02
8 Volume of labour (level, millions)	0.40	0.42
9 Labour productivity change	0.9%	-2.6%
10 Real change in net worth to owners (billion euros)	153	171
due to real saving and capital transfers	16	13
due to real other changes in the volume	1	3
due to real holding gains on assets	81	135
due to real holding gains on liabilities to creditors	55	20
Keyratios		
1 Output per employee (full-time eq.)	161.5	165.3
2 Value added per employee	82.0	85.0
3 Compensation of employees per employee	49.7	51.9
4 Operating surplus per employee	29.8	30.7
5 Entrepr.income before tax % Net Worth to owners	7%	5%
6 Entrepr.income after tax % Net Worth to owners	6%	5%
7 Change in net worth to owners %Net worth to owners	36%	29%
8 Real change in net worth to owners %Net worth to owners	33%	27%
9 Solvency ratio, beginning of year	83%	80%
10 Solvency ratio, end of year	80%	78%
11 Relative size in Domestic employment	3.4%	3.5%
12 Relative size in Domestic Product	5.3%	5.4%



Table 6.4f Opening balance sheet: Stocks of financial assets by sector of debtor or creditor

Assets (A) and liabilities (L)	Sectors									
	NFC	Financial corporations				GG	HH	NE	ROW	Total
		MFI	Insur. & pens.	Other	Total					
A Financial assets	540	1381	1025	310	2716	200	1808	5264	1114	6378
monetary gold and SDRs	0	40	0	0	40	0	0	40	0	40
currency	1	4	0	0	4	0	37	42	0	42
deposits	136	210	35	24	269	31	351	787	289	1076
securities other than shares	21	196	311	30	537	4	58	620	188	808
loans	170	922	355	87	1364	77	4	1615	166	1781
shares and other equity	234	33	297	175	505	85	361	1185	472	1657
insurance technical reserves	8	0	0	0	0	0	960	968	6	974
net other accounts receivable	-30	-24	27	-6	-3	3	37	7	-7	0
L Liabilities	1397	1366	1062	339	2767	566	471	5201	1177	6378
monetary gold and SDRs	0	0	0	0	0	0	0	0	40	40
currency	0	39	0	0	39	3	0	42	0	42
deposits	0	856	0	0	856	0	0	856	220	1076
securities other than shares	30	183	0	15	198	386	0	614	194	808
loans	580	181	34	73	288	177	471	1516	265	1781
shares and other equity	787	107	56	251	414	0	0	1201	456	1657
insurance technical reserves	0	0	972	0	972	0	0	972	2	974

currency. The Polderland statistics reveal that monetary gold and SDR's (40 billion euros less 4 billion euro currency) cover nearly the full value of the currency issued (42 billion euros). The allocation and cancellation of SDR's are recorded as other changes in the volume; they are thus not recorded as financial transactions.

The role of maintaining the internal and external value of the currency pertains in fact to all transactions by the central bank, including issuing currency and changing the size and composition of international reserves.

The role of other monetary financial institutions is to provide normal banking services, i.e. to intermediate money received as deposits (or close substitutes of deposits). The balance sheet of financial corporations shows that at the beginning of 2007 856 billion euros was received as deposits. Interest should be paid on these deposits. Furthermore, many financial services are provided without explicitly charges. These expenditures are financed by investing the money deposited in loans (e.g. mortgages), securities and equities; these investments have generally higher rates of return than the rate of interest to be paid on deposits. The value of the output of these services (Financial Intermediation Services Indirectly Measured; FISIM) is therefore defined as the excess of property income on investing deposited money over the interest paid on deposited money.

The services provided by the central bank are generally financed in a similar way. The value of the output of central banking services is therefore also defined similarly.

Other monetary financial institutions may also provide various services for which fees or commissions are explicitly charged. Cases in point can be e.g. currency exchange, advice about investments or advice on taxation. The output of such services is valued on the basis of the fees or commissions charged.

The Polderland statistics show that the output of monetary financial institutions was 30 billion euros in 2007. The explicitly charged output was 10 billion euros, while the indirectly financed output was 20 billion euros.

### *Insurance companies and pension funds*

The major role of insurance companies and pension funds is the *pooling of risks*. Insurance reduces individual risks by redistributing income over the insured: all have to pay a premium and only those actually hurt receive a claim. The premiums should be higher than the claims, as they are also used to pay for the services provided. The premiums actually paid can therefore be regarded as the sum of net premiums and a charge for the insurance services provided. The net premiums are the income redistributed among the insured. The basic definition of the output of insurance services is therefore the excess of gross premiums over claims.

A distinctive feature of *pension funding and life insurance* (excluding term insurance) is that they do not only pool risks but constitute *also a way of saving by the policyholders*. There is in general a long delay between the payment of premiums and the payment of claims. The premiums received can thus be invested and the income from these investments is a resource for the insurer. However, the claims will also assume explicitly or implicitly a return on these investments. The more general definition of the output of insurance is therefore the excess of gross actual premiums and the income from the investment of insurance technical reserves over the total claims due and the change in actuarial reserves<sup>77</sup>. This is the definition underlying the 25 billion euros of output by insurance companies and pension funds in 2007.

Insurance technical reserves are invested in financial assets, land or buildings. The income on financial assets and land is net property income, i.e. property income after deducting any interest paid. Investment in buildings generates net operating surplus. The incomes on insurance technical reserves are exclusive of holding gains and losses.

The operating surplus and the property income received can be split in two parts:

- those pertaining to own funds;
- those pertaining to insurance technical reserves.

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<sup>77</sup>In case of with-profits insurance, including also the change in the reserves for with-profits insurance.

The incomes on insurance technical reserves are thus recorded as resources for the financial corporations. However, the balance sheet shows that insurance technical reserves are a liability for financial corporations and a financial asset for the policyholders. In the beginning of 2007, the total insurance technical reserves were a liability of 972 billion euros, of which 158 billion pertains to life insurance, 780 billion euros pertains to pensions and 34 billion euros to casualty insurance. The income on these insurance technical reserves should therefore also be recorded as property income attributed to insurance policy holders. In 2007, the property income attributed to policyholders was 60 billion euros (see table 5.6a, allocation of primary income account).

The Polderland-statistics on financial corporations explicitly distinguish three types of insurance: life insurance, pension funding and casualty insurance. This reflects the different recording principles, in particular with respect to the redistribution of income.

#### *Life insurance*

In the case of life insurance, the premiums and claims are not at all recorded as current transfers, i.e. as redistribution of income. Part of the gross actual premiums is recorded as the revenues for life insurance services. The rest of the gross actual premiums are only recorded as financial transactions, i.e. as additions of the insurance technical reserves belonging to the insured. The same applies to the property income attributed to the life insurance holders. Claims paid out are recorded as reductions of the life insurance technical reserves.

#### *Pension funding*

In the case of pension funding, the net contributions and the income on insurance technical reserves (the supplements) are recorded as current transfers received by financial corporations. The benefits paid out are recorded as current transfers paid by financial corporations.

In 2007, the net actual pension contributions received by financial corporations were 21 billion euros. The supplements were more than twice as large: 47 billion euros. The pension benefits paid out were only 33 billion euros. This implies that the financial corporations have received 35 billion euros (21 plus 47 minus 33) more pension contributions than they had to pay out on pension benefits. This increases their disposable income by the same amount.

For non-financial corporations, saving was equal to disposable income. However, for pension funds the situation is different. Pension fund technical reserves are regarded as the property of the insured. This implies that the payment of (net) pension contributions and benefits should not change the saving of the insured and the insurer. In order to achieve this, a correction should be made. This correction is exactly equal to the redistribution of income due to pension contributions and benefits. In 2007, the correction should thus be 35 billion euros.

In the financial account, the change in the pension fund technical reserves is recorded. The net contributions and the supplements should be recorded as additions and the benefits paid out as reductions. This implies that all these items are recorded twice: once as current transfers and once as financial transactions. The supplements are even recorded four times, as they are also recorded as property income receivable (or net operating surplus) and property income payable.

#### *Casualty insurance*

In the case of casualty insurance, net actual premiums and claims payable should be recorded as current transfers received and paid. There may also be a small amount of supplements to be recorded as current transfers received. Casualty insurance does not involve saving. As a consequence, the insurance technical reserves are limited to prepayments and reserves for outstanding claims. The changes in the insurance technical reserves are therefore also very small. They are recorded as liabilities of financial corporations in the financial account.

#### *Social versus individual insurance*

Our distinction of three types of insurance (life, pension and casualty) is suitable for understanding the accounting principles applied. However, this distinction does not

correspond with the distinctions made by the guidelines. In particular for describing the redistribution of income and establishing a link with compensation of employees, they prefer a distinction between social and individual insurance schemes<sup>78</sup>.

Individual insurance schemes include life, pension and casualty insurance fully taken out on the individual's own initiative and for their own benefit, independently of their employers or government. Social insurance schemes include life, pension and casualty insurance organised collectively, compulsory by law or by the conditions of employment. Social insurance contributions can be paid by employers, employees, self-employed and non-employed persons.

The standard national accounts breaks compensation of employees into two components: wages and social contributions by employers. In this way, an explicit link is made between compensation of employees and social contributions by employers.

#### *Modifications for analysis*

The Polderland-tables have shown the role of financial corporations in an unconsolidated way, i.e. including all transactions, claims and liabilities between units within the sector financial corporations and its subsectors. However, in order to show the interaction of financial corporations with the rest of the economy, the financial corporations should be described in a consolidated way, i.e. only showing the transactions, claims and liabilities with the rest of the economy.

For the analysis of the sector financial corporations it is also important to distinguish between internal flows/stocks and those with other (sub)sectors.

For a proper analysis of the financial flows and stocks, the credit and debt-relations between the various (sub)sectors should be shown. This implies that the (sub)sectors of the debtors and the corresponding creditors are shown by type of financial asset. This requires for each type of financial asset a matrix with the debtors and creditors involved.

#### *Specific conventions*

The national accounts do not only record explicit interest payments, but make also some *implicit interest payments* explicit. This pertains to zero-coupon bonds or deep-discounted bonds. Zero coupon bonds are bonds without coupon payments. The interest payments are implicitly included in the redemption price. Deep-discounted bonds are bonds with partly implicit interest payments included in the redemption price and partly some explicit interest payments. According to the national accounts, these bonds should be treated as if they were loans with only explicit interest payments and where the redemption price is equal to the issue price. The implicit interest payments can be calculated by translating the difference between the issue price and the redemption price via the market interest rate at the moment of issuing the bond into corresponding explicit interest payments.

*Shares and other equity are to be valued at their current prices and not at their nominal values.* However, *loans are to be valued at the amount of the principal that is contractually to be repaid.* Long term loans issued at interest rates that are now much lower or higher than the market interest rate are not to be translated into loans issued at the current market interest rate. In fact, interest payments recorded in the national accounts are not the payments corresponding to the current market interest rate but at the market interest rate when the loan was issued.

The national accounts distinguish between operational and financial leasing. In case of operational leasing, the leasing period does not cover all good's economic lifetime. Furthermore, lessors normally assume responsibility for repair of the good and for its replacement in case of a breakdown. In case of financial leasing all risks and rewards of ownership are, de facto though not de jure, transferred from the lessor to the lessee. The national accounts recognises the economic reality behind financial leasing: the lessor provides the lessee with a loan enabling the lessee to purchase a durable good, of which the lessee becomes the de facto owner. Thus, the standard national accounts treats the durable goods as

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<sup>78</sup> Individual insurance schemes are labelled 'other insurance schemes' in the guidelines.

if owned by the lessee from the beginning of the leasing period. Rental actually paid by the lessee to the lessor have to be subdivided into repayments of principal and interest payment related to the imputed loan.

Financial derivatives, like options, futures and swaps are valued at their current exchange value. Financial derivatives should be recorded as a financial asset separate from the underlying asset. This applies even when financial derivatives are used for hedging the risks of the underlying asset. For example, a Dutch company has a long-term contract to deliver cars or oil at some fixed price in dollar. It has hedged the risks of a drop in the exchange rate of the dollar versus the euro. When the drop actually occurs, the sales should be valued in euros at the current dollar/euro-exchange rate. It should not be valued at the hedged dollar/euro-exchange rate. The hedge contract should be valued separately by all parties involved.

The standard financial accounts *do not record the flows of money as they actually occur*:

- The financial accounts merely record the net result of the various financial transactions by type of financial asset and liability during the accounting period. For example, when during the accounting period the same value of bonds are bought and sold no financial transaction is actually recorded.
- Furthermore, some money flows are recorded in a re-routed way. For example, suppose an employer withholds part of the compensation of employees in order to pay wage tax on behalf of the employees to the tax authorities, this one payment is recorded as two separate payments: one fictitious payment from the employer to the employee and one fictitious payment from the employee to the tax authorities.
- Financial transactions may also include various imputed money flows, like reinvested earnings on direct foreign investment or the redemption of a deep-discounted bond by amount of the fictitious interest payments.
- Financial transactions may also be the counterpart of a non-financial transaction without any corresponding money flows (yet). For example, a good is sold but not yet paid. As a consequence, also a trade credit by amount of the sales value is recorded in the standard national accounts.

The guidelines *do not define the volume and price of insurance services and financial intermediation services indirectly measured*. For example, the ESA95 states: “[such] a breakdown ... can usually only be made on arbitrary grounds and would have to be based on conventions” (paragraph 10.40).

### 6.4.2 Discussion

This section discusses the relevance of the national accounts’ description of financial corporations. This relevance will be investigated in four ways.

First, the sector financial corporations and its subsectors are *compared with some alternative classifications*. This clarifies how logical or arbitrary the sector non-financial corporations is. This can be regarded as a first test on relevance.

The second way of testing the relevance is to make a *comparison with business accounts*. Substantial and arbitrary differences will indicate that the link with individual business accounts has become diffuse and obscure. This distortion of the micro-macro link makes the national accounts concepts less useful for understanding the behaviour of a group of individual financial companies, i.e. the sector financial corporations. Furthermore, the reliability of national accounts statistics on financial corporations will be at stake, as the business accounts become less suitable as a data source. Finally, the various users of business accounts, like managers, investors, financial analysts and banks, will regard the national accounts statistics as incomprehensible and irrelevant for their work.

The third way the relevance of the national accounts statistics on financial corporations will be tested is by looking at their relevance for monetary policy.

The fourth relevance test is a comparison with economic theoretic notions about money and insurance.

### *The logic of the sector financial corporations*

The remarks made on the delimitation of the sector non-financial corporations are also relevant to financial corporations, e.g. about separately showing the role of national multinationals and about the relevance of the distinction between real and quasi-corporations. The only exception pertains to the need of adding an industry-classification, as this is actually done for the sector financial corporations.

The type of product produced is used as a criterion in delimiting the sector financial corporations. However, from this perspective it seems strange that social insurance institutions are in the sector government. The major difference between social and private insurance is another criterion: market or non-market production. This is thus the second criterion used in delimiting the sector financial corporations.

We can also look at the delimitation of the sector financial corporations by investigating how this second criterion is applied. From this perspective it is strange that the central bank is included in the sector financial corporations and is not in the sector government.

The principal activity of the central bank is to issue currency, to maintain the internal and external value of the currency and to hold the international reserves of the country. This is the clear example of the provision of a collective service not subject to any market mechanism. The guidelines treat the central bank as a market producer whose output is to be determined in the same way as other monetary financial institutions. However, most of the revenues by the central bank are not the revenues on the principal activity by the central bank. These revenues are usually the direct result of profitable regulatory power or a legal monopoly on specific profitable tasks, e.g. currency exchange. These revenues are therefore better regarded as taxes, e.g. taxes on currency exchange. The output of the central bank can then be determined as all other non-market output, i.e. as the sum of the production costs.

### *A comparison with business accounts*

For non-financial corporations a comparison was made with the business accounts (section 6.3). The same common grounds and differences apply also to financial corporations. However, not exactly the same conclusions should be drawn, as there are also some specific concepts applying only to financial corporations. We will therefore first discuss these specific concepts and draw then general conclusions.

The national accounts have special conventions for measuring the output of monetary financial institutions and insurance companies. These conventions are in line with the conventions used in the business accounts of such companies. The same applies to recording the insurance technical reserves on the financial account and balance sheet. This greatly contributes to the relevance and comprehensibility of the national accounts statistics.

However, with respect to insurance, the Polderland-statistics had to deviate from the guidelines in order to become comprehensible. For example, the distinction between life, pension and casualty insurance was stressed by the Polderland-statistics, while the distinction between social insurance and individual insurance was suppressed. Furthermore, also the distinction between net actual contributions and contributions supplements (income on insurance technical reserves) was introduced in the accounts.

Without these modifications, the way insurance is recorded by the national accounts cannot be understood. In this respect, the guidelines seem to have overburdened the system: they use the complicated bookkeeping logic that belongs to one distinction (life, pension, casualty), while presenting two other distinctions (social and individual; compulsory and voluntary) as the most important ones.

Furthermore, the correction for pension fund reserves is made in order to ensure a proper concept of saving of households and the financial corporations. However, for a proper concept of disposable income of financial corporations, the correction is also relevant. Net pension contributions and benefits only redistribute income among pension policyholders. They do not redistribute the income of financial corporations. The correction should therefore be

introduced before calculating disposable income. This implies that the official national accounts concept of disposable income is not very relevant for financial corporations.

Finally, property income attributed to insurance policy holders is twice recorded as a resource (property income received and social contributions received) and once as a use (property income paid). As a consequence, the standard national accounts contain a substantial amount of double-counting which is not very helpful for analysing insurance companies as such.

A strong point of the national accounts description of non-financial corporations was the link with the rest of the economy. This is much less true for financial corporations. From the producer's point of view, the specific conventions on the output of FISIM and insurance make sense. However, from the point of view of the users of these services, they should better be regarded as a virtual reality. This topic will be discussed in the role of households, the role of the rest of the world and in the national economy as a whole.

We conclude therefore that the national accounts has much in common with the business accounts of financial corporations, but that there are also substantial differences. For analysing the behaviour of monetary financial institutions as such, the presentation is in most respects relevant. However, for analysing the behaviour of insurance companies and pension funds, the national accounts description is incomprehensible and hardly relevant to those actually involved in insurance activities.

### *Monetary and insurance policy*

The standard national accounts describe the role of the money providers systematically by showing a separate sector financial corporations and by using a subsectoring reflecting different roles in the supply of money, e.g. the roles of the central bank and other monetary financial institutions. The accounting structure helps to analyse and monitor the interactions between the supply of money and the demand for money stemming from the real economy (saving and capital formation), financial investment (portfolio analysis) and financing (debt analysis). Furthermore, the roles played by the government (e.g. government deficit and government debt), the rest of the world (e.g. imports, exports, capital flows, financial flows and the international demand for the national currency), non-financial corporations and households are explicitly shown. In this way, the standard national accounts seem to be an ideal tool for analysing and monitoring the transmission mechanism of monetary policy decisions.

However, no effort is made to link the classification of financial assets to that of measures of money. For modelling and managing the supply of money, different measures of money are applied, e.g. differing with respect to the degree of liquidity. In reporting to the European Central Bank, the standard financial accounts and balance sheets are therefore elaborated in such a way that also different measures of money can be derived. M1 is equal to currency in circulation plus overnight deposits. M2 is equal to M1 plus deposits with agreed maturity up to 2 years plus deposits redeemable at notice up to 3 months. M3 is equal to M2 plus repurchase agreements, money market fund shares/units and money market paper and debt securities up to 2 years.

In the standard national accounts, social contributions are a complicated mixture of net and gross insurance contributions. Social security contributions are gross as no charge for services is deducted. The reason is that the output of social security schemes is regarded as other non-market output (see section 6.3) and therefore not determined as the difference between gross premiums and claims. In principle, the insurance premiums to financial corporations (all by definition market producers) are all to be recorded net of a service charge. This applies also to social contributions to financial corporations. However, no service charge is to be calculated for social contributions by employers. All the service charges are treated as charges against the employees' contributions and not the employers'. This way of recording is even used when some type of contributions is only paid by the employer. The unbalanced way in which service charges are deducted from gross social contributions makes the standard

national accounts concepts of social contributions not suited for analysis. For analysis gross social contributions are therefore to be preferred.

### *Economic theory*

The economic rationale underlying the different types of insurance is well reflected in the different recording principles. However, by also stressing the importance of the distinction between social and individual insurance this rationale is hidden.

Payments for the use of money, like dividends and interest payments, could be regarded as *payments for a non-factor service*, i.e. the use of money. Use of money could be regarded as the use of other property, like dwellings, fixed assets and consumer durables. Enterprises, governments and households are prepared to pay for the use of money, because lending money makes it possible to change at will the time and amount of investment and consumption. Furthermore, purchasing power now is in general preferred to purchasing power in the future. This also explains that interest should be paid for lending money. The willingness to pay evidences that the use of money is a service just like the use of other kinds of property. If payments for the use of money are recorded as payments for a service, households with mortgages and consumer credit would produce a service by paying their interest. Final consumption expenditure by the government would increase by amount of the interest paid on the government debt, final consumption expenditure by households would increase with the interest paid on consumer credit and intermediate consumption and capital formation by corporations would increase by amount of the corresponding interest charges.

The major drawbacks of this alternative way of accounting is that the classical division between the production process and the financing of the production process would collapse, that the link with the business accounts is lost and that the breakdown of interest payments and interest receipts by industry is problematic analytically and statistically. However, a major advantage would be that similar actions are treated similar: in the standard national accounts lending money by a bank is production by amount of the implicit service charge, while lending money by non-financial producers or households is no production. Furthermore, it would avoid the arbitrary imputation of services not perceived as such by the users of these services (FISIM).

The *concept of output of insurance services* in the standard national accounts can be defined as “the activities carried out by the industry to maintain the capacity for pooling risks” (see Sherwood, 1999, p. 520). However, an alternative perception well grounded in economic literature is that the output of insurance services is equal to the assumption of risk.

Following this alternative perception, the value of the output should be equal to the gross insurance premium. Furthermore, the volume of this output should be defined in terms of the amount of risk assumed and not in terms of the volume of the administrative activities. However, regarding insurance services as the assumption of risk would imply that the insurance premiums are the sale of a service and that the claims are a transfer or another change in the volume of assets. This would well reflect the perceptions of the insured, but does not fit in a consistent set of accounts for the national economy. For example, a proper concept of value added and operating surplus of insurance companies can only be obtained when claims are regarded as intermediate consumption, i.e. as the purchase of current goods and services. However, this would imply that the insured is selling a service when receiving a claim. This certainly does not reflect the perceptions of the insured and would not be very meaningful for analysis.

### **6.4.3 Summary**

The standard national accounts describe the financial corporations in terms of a coherent set of accounts in current prices. This description has much in common with the business accounts, e.g. the presentation in terms of accounts, the use of double-entry bookkeeping, the terminology and even the valuation of the output of banks and insurance companies. Nevertheless, there are also four important differences:



- The national accounts are much more standardised nationally, internationally and over time.
- The national accounts distinguish much more accounts and balancing items.
- The standard national accounts do not have concepts that correspond to profit-after-tax and equity shareholders' interest in the business accounts.
- The concepts in the national accounts differ substantially with respect to delimitation, valuation and time of recording. A major distinction in the standard national accounts is that between social and individual insurance. This distinction is absent in the business accounts. Furthermore, the national accounts presentation contains a substantial amount of double-counting, as property income attributed to insurance policy holders is recorded twice as a resource and once as a use.

These differences reflect to a great extent two differences in purposes. The first difference pertains to the need to standardisation. Standardisation of the national accounting concepts is essential for obtaining meaningful and comparable totals on non-financial corporations. Standardisation of the business accounts is less essential.

The second difference is that the purpose of the national accounts is to describe corporations as part of a consistent description of the national economy; this is no purpose of the business accounts. However, describing corporations as a fully consistent part of the national economy has also clear disadvantages. From the point of view of data users mainly interested in the development of financial corporations as such, the standard national accounts description contains an excessive number of accounts, is not very comprehensible and contains sub-optimal concepts. The latter is evidenced by the income concepts. The income concepts of the business accounts, e.g. profit on ordinary activities, extraordinary profit, total profit and total profit after tax, are much better focused on the data needs of managers, investors, banks and most other third parties.

The only way to remedy this lack of relevance is to present supplementary ad hoc tables. These tables should be simpler, closer to business accounting practice and partly inconsistent with the standard national accounting concepts of the whole system. For example, the national accounts' counterpart of profit after tax can only be defined in an ad hoc way. The various national accounts concepts should be used as building blocks while the accounting structure is disregarded.

The comparison with economic theoretic concepts indicates that the standard national accounts is a description with some specific theoretical elements, e.g.:

- The implicit interest in the redemption price of zero-coupon bonds is explicitly recorded as interest
- Pensions are explicitly recorded as a mixture of a redistribution by the pooling of risks and saving.
- Real holding gains are part of the accounting structure;

However, the standard national accounts is also in major respects fundamentally different. They do not regard the use of money as output like the renting of a dwelling or machinery. They also do not regard transferring risk as the output of insurance. Furthermore, they record loans at their nominal value and not at their market value.

The standard national accounts is in general very well suited as a tool for analysing and monitoring the transmission mechanism of monetary policy decisions. However, for this purpose an explicit link with different measures of money is required. The recording in the standard national accounts of social contributions is misleading and a complicated mix of net and gross contributions. For analysis, only gross social contributions should be used.

The national accounts description of financial corporations and the financial transactions is not a direct reflection of what can be readily observed. It transforms what can be readily observed into a well-structured model stressing basic distinctions like those between financial and non-financial transactions and between production and redistribution. The financial account does not record all money flows as they actually occur, as many money flows are netted, spliced or re-routed and several imputations are included.

The Polderland-tables illustrate how the standard national accounts can be made more comprehensible and more relevant, e.g. by explicitly showing the type of insurance involved

and by showing the part of insurance contributions corresponding to the property income attributed to insurance holders.

The treatment of the central bank as a market producer is not very convincing. It should better be regarded as an other non-market producer taking care of one of a typical collective task. As a consequence, it should be recorded at the sector government.

## 6.5 General government

### 6.5.1 Description (including supplementary concepts and tables)

#### *Delimitation of the government*

The general government is one of the major groups of economic actors in the national economy. Two important roles<sup>79</sup> are played: non-market producer and re-distributor of income and capital.

The Polderland-statistics can be used to illustrate their importance. The government is responsible for about 12% of Domestic Product and for over 15% of domestic employment. Taxes and social security contributions received by the government amounted to 46% of National Income. Government expenditure was 56% of National Income and government debt was nearly 90% of National Income.

The sector general government consists of all other non-market producers mainly financed and controlled by the government. This includes:

- the traditional layers of government administration, like ministries, provinces and municipalities.
- social security funds and their executive bodies.
- other non-profit institutions mainly financed and controlled by the government. The importance and scope of this group depends on the specific national institutional structure. It can cover in principle a wide range of institutions, e.g. schools, police regions, polder boards, institutions running official employment projects, museums and community centres. These institutions could be regarded as executive bodies of the traditional layers of government.

The guidelines recommend to split the sector general government into four subsectors: the central government, the state government (when relevant), the local government and social security funds. The latter may also be distributed by level of government.

Furthermore, the guidelines also recommend to distinguish a public sector. The public sector encompasses the sector government but includes also market producers mainly controlled by the government. Cases in point are the central bank, the national railway company, the national aircraft industry and, in the Netherlands, hospitals.

In our Polderland-statistics, only tables are shown for the whole sector general government.

#### *The tables*

The role of the government is described by ten tables: a current account, an accumulation account, a balance sheet, a table on government income and expenditure, two tables on government expenditure by function, three tables on taxes and a table with prices, volumes and key ratios (tables 6.5a-6.5j).

The first three tables are in many respects similar to those for the non-financial corporations. In this section, we will therefore focus our explanation on:

- the concepts of output and final consumption expenditure in the current account;
- the redistribution of income and capital in the current and accumulation account;
- the table on revenue and expenditure of the consolidated government;
- the table showing expenditure by function;
- the table showing prices, volumes and key-ratios.

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<sup>79</sup> A third important role of the government is that of organiser of the national institutional framework (e.g. the legal enforcement of contracts and general regulations on working conditions and opening hours of shops). This role is not described by the national accounts. A fourth role is that of owner of corporations. This is described by the national accounts concept public corporations.

Table 6.5a Current account for General government

	2007	2008	08-07	08/07
I. Production account				
R Output at basic prices	140	147	7	5%
actual market output	23	23	0	0%
own-account capital formation	1	1	0	0%
other non-market output	116	123	7	6%
U Intermediate consumption	46	49	3	7%
Consumption of fixed capital	19	20	1	5%
Net value added at basic prices	75	78	3	4%
II.1.1 Generation of income account				
R Net value added at basic prices	75	78	3	4%
U Compensation of employees	75	78	3	4%
wages and salaries	60	60	0	0%
<i>actual employers' social contributions</i>	7	9	2	29%
<i>imputed employers' social contributions</i>	8	9	1	13%
Other taxes on production	1	1	0	0%
minus Other subsidies on production	-1	-1	0	0%
Net operating surplus	0	0	0	
II.1.2 Allocation of primary income account				
R Net operating surplus	0	0	0	
Taxes on production or imports	85	90	5	6%
taxes on products	77	82	5	6%
other taxes on production	8	8	0	0%
Property income receivable	19	17	-2	-11%
interest	5	6	1	20%
dividends	6	5	-1	-17%
withdrawals from quasi-corporations	1	1	0	0%
rents on land and subsoil-assets	7	5	-2	-29%
U Subsidies on production or imports	11	12	1	9%
subsidies on products	5	6	1	20%
other subsidies on production	6	6	0	0%
Property income payable	38	38	0	0%
interest	38	38	0	0%
Balance of primary incomes	55	57	2	4%

Table 6.5a Current account for General government (continued)

	2007	2008	08-07	08/07
II.2 Secondary distribution of income account				
R Balance of primary incomes	55	57	2	4%
Current transfers in cash receiveable	316	332	16	5%
social security contributions	114	118	4	4%
<i>imputed employers' social contributions</i>	8	9	1	13%
current taxes on income, wealth, etc.	92	95	3	3%
transfers within general government	100	106	6	6%
other current transfers n.e.c.	2	4	2	100%
U Current transfers in cash payable	211	217	6	3%
social security benefits in cash	73	70	-3	-4%
unfunded employee social benefits	8	9	1	13%
social assistance benefits in cash	21	22	1	5%
transfers within general government	100	106	6	6%
transfers to the rest of the world	7	8	1	14%
other current transfers n.e.c.	2	2	0	0%
Disposable income	160	172	12	8%
II.4 Use of disposable income account				
R Disposable income	160	172	12	8%
U Final consumption expenditure	170	179	9	5%
use of actual market output	54	56	2	4%
social security benefits in kind via market producers	46	48	2	4%
social assistance benefits in kind via market producers	8	8	0	0%
use of other non-market output	116	123	7	6%
collective	81	87	6	7%
individual	35	36	1	3%
Saving	-10	-7	3	-30%

Table 6.5b Accumulation account for General government

		2007	2008	08-07	08/07
	III.1. Capital account				
A	Gross capital formation	21	22	1	5%
(=U)	minus Consumption of fixed capital	-19	-20	-1	5%
	Acquisition of other non-financial assets	-4	-4	0	0%
	Capital transfers payable	16	13	-3	-19%
	transfers within general government	10	7	-3	-30%
	other capital transfers	6	6	0	0%
L	Saving	-10	-7	3	-30%
(=R)	Capital transfers receiveable	16	10	-6	-38%
	capital taxes	2	2	0	0%
	transfers within general government	10	7	-3	-30%
	other capital transfers	4	1	-3	-75%
	Net borrowing	8	8	0	0%
	III.2 Financial account				
A	Net acquisition of financial assets	-18	-34	-16	89%
L	Net incurrence of liabilities	-10	-26	-16	160%
	Net lending	-8	-8	0	0%
	III.3 Other changes in assets account				
A	Other changes in non-financial assets	10	11	1	10%
	volume changes	-3	-2	1	-33%
	nominal holding gains	13	13	0	0%
	neutral holding gains	17	6	-11	-65%
	real holding gains	-4	7	11	-275%
	Other changes in financial assets	5	2	-3	-60%
	volume changes	0	-1	-1	
	nominal holding gains	5	3	-2	-40%
	neutral holding gains	4	1	-3	-75%
	real holding gains	1	2	1	100%
L	Other changes in liabilities	2	2	0	0%
	volume changes	0	1	1	
	nominal holding losses	2	1	-1	-50%
	neutral holding losses	12	4	-8	-67%
	real holding losses	-10	-3	7	-70%
	Net other changes in assets	13	11	-2	-15%

Table 6.5c Balance sheets for General government

	2007	2008	08-07	08/07
IV.1 Opening balance sheet				
A Non-financial assets	780	788	8	1%
Financial assets	200	187	-13	-6%
L Liabilities	566	558	-8	-1%
Net worth	414	417	3	1%
<i>P.M. Military weaponry</i>	<i>30</i>	<i>29</i>	<i>-1</i>	<i>-3%</i>
IV.2 Changes in balance sheet				
A Changes in non-financial assets	8	9	1	13%
Changes in financial assets	-13	-32	-19	146%
L Changes in liabilities	-8	-24	-16	200%
Changes in net worth	3	1	-2	-67%
<i>P.M. Military weaponry</i>	<i>-1</i>	<i>-1</i>	<i>0</i>	<i>0%</i>
IV.3 Closing balance sheet				
A Non-financial assets	788	797	9	1%
Financial assets	187	155	-32	-17%
L Liabilities	558	534	-24	-4%
Net worth	417	418	1	0%
<i>P.M. Military weaponry</i>	<i>29</i>	<i>28</i>	<i>-1</i>	<i>-3%</i>

Table 6.5d Revenue and expenditure of the consolidated general government (supplementary table)

	2007 abs.	2008 abs.	08-07 abs.	08/07 %ch.	2008 comp.	2008 %NNI
<b>A. Revenue</b>						
Taxes	179	187	8	4%	52%	28%
taxes on production or imports	85	90	5	6%	25%	13%
current taxes on income, wealth, etc.	92	95	3	3%	26%	14%
capital taxes	2	2	0	0%	1%	0%
Social security contributions	114	118	4	4%	33%	18%
Actual market output	23	23	0	0%	6%	3%
Property income receiveable	19	17	-2	-11%	5%	3%
Other revenue	16	16	0	0%	4%	2%
own-account capital formation	1	1	0	0%	0%	0%
other subsidies on production	1	1	0	0%	0%	0%
imputed employers' social contributions	8	9	1	13%	2%	1%
other current transfers receiveable	2	4	2	100%	1%	1%
other capital transfers receiveable	4	1	-3	-75%	0%	0%
<b>Total revenue</b>	<b>351</b>	<b>361</b>	<b>10</b>	<b>3%</b>	<b>100%</b>	<b>54%</b>
current	345	358	13	4%	99%	54%
capital	6	3	-3	-50%	1%	0%
<b>B. Expenditure</b>						
Compensation of employees	75	78	3	4%	21%	12%
Intermediate consumption	46	49	3	7%	13%	7%
Gross capital formation	21	22	1	5%	6%	3%
Social security benefits	119	118	-1	-1%	32%	18%
in cash	73	70	-3	-4%	19%	10%
in kind	46	48	2	4%	13%	7%
Social assistance benefits	29	30	1	3%	8%	4%
in cash	21	22	1	5%	6%	3%
in kind	8	8	0	0%	2%	1%
Property income payable	38	38	0	0%	10%	6%
Subsidies	11	12	1	9%	3%	2%
Other expenditure	20	22	2	10%	6%	3%
other taxes on production	1	1	0	0%	0%	0%
unfunded employee social benefits	8	9	1	13%	2%	1%
transfers to the rest of the world	7	8	1	14%	2%	1%
other current transfers payable	2	2	0	0%	1%	0%
capital transfers payable	6	6	0	0%	2%	1%
disposal of other non-produced assets	-4	-4	0	0%	-1%	-1%
<b>Total expenditure</b>	<b>359</b>	<b>369</b>	<b>10</b>	<b>3%</b>	<b>100%</b>	<b>55%</b>
current (incl. cons. of fixed capital)	355	365	10	3%	99%	55%
capital (cons.of fixed capital deducted)	4	4	0	0%	1%	1%
<b>P.M. Consumption of fixed capital</b>	<b>19</b>	<b>20</b>	<b>1</b>	<b>5%</b>	<b>5%</b>	<b>3%</b>
Output	140	147	7	5%	40%	22%
Final consumption expenditure	170	179	9	5%	49%	27%
<b>C. Balancing items</b>						
Saving	-10	-7	3	-30%		-1%
Net lending	-8	-8	0	0%		-1%



Table 6.5e Taxes received by the government and the rest of the World (supplementary detail)

	2007 abs.	2008 abs.	08-07 abs.	08/07 %ch.	2008 comp.	2008 %NNI
Value added tax (VAT)	51	54	3	6%	28%	8%
government	47	50	3	6%	26%	7%
Rest of the World	4	4	0	0%	2%	1%
Wage tax	41	44	3	7%	23%	7%
Corporation tax	32	33	1	3%	17%	5%
Excise duties	15	16	1	7%	8%	2%
Environmental levies	8	10	2	25%	5%	1%
Tax for owning motor vehicles	5	5	0	0%	3%	1%
Tax on the purchase of passenger cars	5	5	0	0%	3%	1%
Income tax	5	3	-2	-40%	2%	0%
Tax on the purchase of real estate	4	5	1	25%	3%	1%
Tax on owning or renting real estate	4	4	0	0%	2%	1%
Dividend tax	4	4	0	0%	2%	1%
Import duties	3	3	0	0%	2%	0%
Inheritance taxes	2	2	0	0%	1%	0%
Other	8	7	-1	-13%	4%	1%
Total taxes	187	195	8	4%	100%	29%
Taxes on production and imports	93	98	5	5%	50%	15%
Current taxes on income, wealth, etc.	92	95	3	3%	49%	14%
Capital taxes	2	2	0	0%	1%	0%
Paid by:						
Residents	185	193	8	4%	99%	29%
Rest of the World	2	2	0	0%	1%	0%
Received by:						
General government	179	187	8	4%	96%	28%
Rest of the World	8	8	0	0%	4%	1%

Table 6.5f Taxes on production and imports received by the government &amp; Rest of the World (supplementary detail)

	2007 abs.	2008 abs.	08-07 abs.	08/07 %ch.	2008 comp.	2008 %NNI
Value added tax (VAT)	51	54	3	6%	55%	8%
government	47	50	3	6%	51%	7%
Rest of the World (EU)	4	4	0	0%	4%	1%
Import duties to the Rest of the World (EU)	3	3	0	0%	3%	0%
EU-levies on food products	1	1	0	0%	1%	0%
Excise duties	15	16	1	7%	16%	2%
Petrol and other mineral oils	10	11	1	10%	11%	2%
Tobacco	3	3	0	0%	3%	0%
Alcohol	1	1	0	0%	1%	0%
Other	1	1	0	0%	1%	0%
Levies on the use of energy	4	4	0	0%	4%	1%
Tax on the purchase of passenger cars	5	5	0	0%	5%	1%
Tax on the purchase of real estate	4	5	1	25%	5%	1%
Tax on insurance premiums	1	1	0	0%	1%	0%
Other	1	1	0	0%	1%	0%
<b>Taxes on products</b>	<b>85</b>	<b>90</b>	<b>5</b>	<b>6%</b>	<b>92%</b>	<b>13%</b>
Tax on owning or renting real estate	3	3	0	0%	3%	0%
Tax for owning motor vehicles	1	1	0	0%	1%	0%
Environmental levies	2	3	1	50%	3%	0%
Other	2	1	-1	-50%	1%	0%
<b>Other taxes on production</b>	<b>8</b>	<b>8</b>	<b>0</b>		<b>8%</b>	<b>1%</b>
<b>Taxes on production and imports</b>	<b>93</b>	<b>98</b>	<b>5</b>	<b>5%</b>	<b>100%</b>	<b>15%</b>
Paid by:						
Residents	93	98	5	5%	100%	15%
Rest of the World	0	0	0		0%	0%
Received by:						
General government	85	90	5	6%	92%	13%
Rest of the World	8	8	0	0%	8%	1%

Table 6.5g Current taxes on income, wealth etc. received by the government & Rest of the World  
(supplementary detail)

	2007 abs.	2008 abs.	08-07 abs.	08/07 %ch.	2008 comp.	2008 %NNI
Corporation tax	32	33	1	3%	35%	5%
Wage tax	41	44	3	7%	46%	7%
Income tax	5	3	-2	-40%	3%	0%
Dividend tax	4	4	0	0%	4%	1%
Current taxes on income	82	84	2	2%	88%	13%
Tax on owning or renting real estate	1	1	0	0%	1%	0%
Tax on net wealth of individuals	2	2	0	0%	2%	0%
Tax for owning motor vehicles	4	4	0	0%	4%	1%
Environmental levies	2	3	1	50%	3%	0%
Other	1	1	0	0%	1%	0%
Current taxes on wealth etc.	10	11	1	10%	12%	2%
Current taxes on income, wealth etc.	92	95	3	3%	100%	14%
Paid by:						
Residents	90	93	3	3%	98%	14%
Non-financial corporations	28	29	1	4%	31%	4%
Financial corporations	5	5	0	0%	5%	1%
Households	57	59	2	4%	62%	9%
Rest of the World	2	2	0	0%	2%	0%
Received by:						
General government	92	95	3	3%	100%	14%
Rest of the World	0	0	0		0%	0%

Table 6.5h Government expenditure by function

	2007 abs.	2008 abs.	08-07 abs.	08/07 %ch.	2008 comp.	2008 %NNI
<b>A. Final consumption expenditure</b>						
1 General public services	13	15	2	15%	8%	2%
2 Defence	12	12	0	0%	7%	2%
3 Public order and safety	9	10	1	11%	6%	1%
4 Economic affairs	26	27	1	4%	15%	4%
5 Environment protection	2	2	0	0%	1%	0%
6 Housing and comm.amenities	7	8	1	14%	4%	1%
7 Health	29	30	1	3%	17%	4%
collective	1	1	0	0%	1%	0%
individual	28	29	1	4%	16%	4%
8 Recreation, culture & religion	4	4	0	0%	2%	1%
collective	1	1	0	0%	1%	0%
individual	3	3	0	0%	2%	0%
9 Education	31	32	1	3%	18%	5%
collective	2	2	0	0%	1%	0%
individual	29	30	1	3%	17%	4%
10 Social protection	37	39	2	5%	22%	6%
collective	8	8	0	0%	4%	1%
individual	29	30	1	3%	17%	4%
Total of all functions	170	179	9	5%	100%	27%
collective	81	87	6	7%	49%	13%
individual	89	92	3	3%	51%	14%
<b>B. Other expenditure</b>						
1 General public services	56	55	-1	-2%	31%	8%
2 Defence	1	1	0	0%	1%	0%
3 Public order and safety	1	1	0	0%	1%	0%
4 Economic affairs	13	12	-1	-8%	7%	2%
5 Environment protection	3	4	1	33%	2%	1%
6 Housing and comm.amenities	3	5	2	67%	3%	1%
7 Health	0	0	0		0%	0%
8 Recreation, culture & religion	1	1	0	0%	1%	0%
9 Education	4	4	0	0%	2%	1%
10 Social protection	107	107	0	0%	60%	16%
Total of all functions	189	190	1	1%	106%	28%
<b>C. Total expenditure</b>						
1 General public services	69	70	1	1%	39%	10%
2 Defence	13	13	0	0%	7%	2%
3 Public order and safety	10	11	1	10%	6%	2%
4 Economic affairs	39	39	0	0%	22%	6%
5 Environment protection	5	6	1	20%	3%	1%
6 Housing and comm.amenities	10	13	3	30%	7%	2%
7 Health	29	30	1	3%	17%	4%
8 Recreation, culture & religion	5	5	0	0%	3%	1%
9 Education	35	36	1	3%	20%	5%
10 Social protection	144	146	2	1%	82%	22%
Total of all functions	359	369	10	3%	206%	55%

Table 6.5i Expenditure of the consolidated general government on social protection (supplementary detail)

	2007 abs.	2008 abs.	08-07 abs.	08/07 %ch.	2008 comp.	2008 %NNI
Compensation of employees	8	8	0	0%	2%	1%
Intermediate consumption	5	5	0	0%	1%	1%
Gross capital formation	0	0	0		0%	0%
Social security benefits	90	89	-1	-1%	24%	13%
in cash	72	70	-2	-3%	19%	10%
in kind	18	19	1	6%	5%	3%
Social assistance benefits	29	30	1	3%	8%	4%
in cash	21	22	1	5%	6%	3%
in kind	8	8	0	0%	2%	1%
Property income payable	0	0	0		0%	0%
Subsidies	3	4	1	33%	1%	1%
Other expenditure	9	10	1	11%	3%	1%
unfunded employee social benefits	8	9	1	13%	2%	1%
other	1	1	0	0%	0%	0%
Total expenditure	144	146	2	1%	40%	22%
final consumption expenditure	37	39	2	5%	11%	6%
collective	8	8	0	0%	2%	1%
individual	29	30	1	3%	8%	4%
other	107	107	0	0%	29%	16%
P.M. Consumption of fixed capital	0	0	0		0	0%
Market output	1	1	0	0%	0%	0%

Table 6.5j Prices, volumes and key-ratios for the government  
(supplementary table)

	2007	2008
Price-changes		
1 Output	1.2%	1.9%
2 Intermediate consumption	1.9%	1.6%
3 Consumption of fixed capital	1.5%	1.6%
4 Value added	2.0%	2.1%
5 Capital formation	1.7%	1.7%
6 Compensation of employees (price per hour worked)	2.1%	2.6%
7 Final consumption expenditure	1.6%	2.3%
8 General price-change of goods and services	2.2%	0.7%
9 Nominal interest rate (long term)	5.2%	4.4%
10 Real interest rate (long term)	3.0%	3.7%
Volumes		
1 Output (% change)	2.3%	2.4%
2 Intermediate consumption (%change)	2.2%	-1.6%
3 Consumption of fixed capital	0.7%	3.7%
4 Value added (% change)	-4.1%	3.2%
5 Capital formation	2.5%	2.0%
6 Volume of labour (% change)	0.5%	1.8%
7 Volume of labour (abs. change)	0.01	0.03
8 Volume of labour (level, millions)	1.89	1.93
9 Labour productivity change	2.0%	0.2%
10 Real change in net worth (billion euros)	-6	-2
due to real saving and capital transfers	-10	-10
due to real other changes in the volume	-3	-4
due to real holding gains on assets	-3	9
due to real holding gains on liabilities	10	3
Keyratios		
1 Output per employee (full-time eq.)	74.0	76.3
2 Value added per employee	39.7	40.5
3 Compensation of employees per employee	39.7	40.5
4 Expenditure as % NNI	56.2%	55.2%
5 Final consumption expenditure as % NNI	26.6%	26.8%
6 Revenue as % of NNI	54.9%	54.0%
7 Taxes and social sec.contr. as % of NNI	47.1%	46.8%
(national) government	45.9%	45.6%
EU	1.3%	1.2%
8 Government deficit as % NNI	-1.3%	-1.2%
9 Government debt as % NNI,beginning	88.6%	83.4%
10 Government debt as % NNI, end	87.3%	79.8%
11 Net worth as % NNI, beginning	64.8%	62.3%
12 Net worth as % of NNI, end	65.3%	62.5%
13 Relative size in Domestic employment	15.8%	15.7%
14 Relative size in Domestic Product	12.0%	11.8%
15 Relative size in fixed capital formation	13.3%	13.0%

### *Output*

The production and generation of income accounts are organised in such a way that output is equal to the sum of the production costs, i.e. output is the sum of:

- intermediate consumption;
- consumption of fixed capital;
- compensation of employees;
- other taxes on production;
- minus other subsidies on production;
- net operating surplus.

Net operating surplus serves as the balancing item of this identity.

By convention, the operating surplus of government output is zero<sup>80</sup>. Government output is therefore equal to the sum of all other production costs.

Government output could have been valued like the output of corporations, i.e. by amount of the sales (plus changes in stocks and own-account capital formation). However, a feature of government output is that only a limited part is explicitly sold. These sales include e.g. school fees, garbage disposal fees, parking fees, entrance fees for museums, rents on school buildings and sports centres and the sales by social workshops. The biggest part of the costs of production are financed by other revenues, e.g. taxes. Valuation of government output on the basis of sales would therefore result in structurally negative operating surpluses, much lower value added and a much lower share in Domestic Product.

In Polderland, the sales by the government (actual market output) are less than 20% of the production costs of the government. As a consequence, other non-market output is over 80% of government output. This is the part of government output financed by other revenues or borrowing.

### *Final consumption*

Recording output not explicitly sold as output introduces a problem: who is consuming this output? By convention, the other non-market output produced by the government is regarded as final consumption expenditure by the government. In this way the use of other non-market output by the government is equal to its supply. It also ensures that saving and net lending by the government are not disturbed. The recording of an imputed resource, i.e. other non-market output, is balanced by the recording of an imputed use, i.e. the corresponding final consumption expenditure.

These imputations are explicitly shown in the Polderland-statistics. In 2007, the other non-market output by the government was 116 billion euros. This amount is also explicitly shown as final consumption expenditure by the government.

Final consumption expenditure by the government also includes some purchases by the government from market producers (actual market output). This pertains to social security benefits in kind and social assistance benefits in kind. Cases in point are medical health care provided via social security schemes, individual rent allowances and a public transport card for students. These benefits are intended to support households but are recorded as final consumption expenditure by the government.

Final consumption expenditure by the government can be split in two parts:

- collective services;
- individual goods and services.

Individual goods and services directly benefit specific persons. The social benefits in kind mentioned above are examples of individual consumption. However, also part of the own-produce by the government can be attributed to the individual beneficiaries. The major

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<sup>80</sup> This statement is valid for the sector general government as a whole and for its institutional units, as the latter are by definition all other non-market producers. However, some of the establishments of these institutional units could be market producers, e.g. a garbage disposal unit of a municipality. Such market producers have a net operating surplus. This does not imply that the government as a whole has a net operating surplus, as the value of the other non-market output of the government is determined as a residual, i.e. as the difference between, on the one hand, the values of its total output and, on the other hand, its market output and output for own final use.

example is education provided by the government. Other examples are the services of government libraries, museums and community centres.

Collective consumption pertains to goods and services that can not directly be attributed to specific persons. Cases in point are defence, public order, public administration and research.

The distinction between collective and individual consumption is used to formulate an alternative, supplementary, description of final consumption. For this purpose the concepts actual final consumption and adjusted disposable income are used. Furthermore, also the concept of income transfers is affected. Actual final consumption by the government is equal to the collective consumption by the government. According to this alternative concept of government consumption, individual government consumption should be recorded as income transfers in kind to households, which is included in their adjusted disposable income and is spent on actual final consumption expenditure. This bookkeeping procedure ensures also that saving and net lending are not affected by the introduction of this alternative concept of final consumption.

In Polderland, final consumption expenditure by the government was 170 billion euros in 2007. Collective consumption was 81 billion euros, i.e. nearly 50%. Individual consumption was 89 billion euros. The biggest part, i.e. 54 billion euros, pertained to social benefits in kind via purchases from market producers. The individual part of the own-produce by the government was 35 billion euros; this consisted for nearly 80% of educational services.

#### *Other features of the current account*

The most interesting feature of the production and generation of income accounts is the valuation of government output. Nevertheless, five other features are also worth noting:

- Intermediate consumption includes the expenditure on military weaponry, like tanks and fighter planes. These expenditure are therefore not recorded as capital formation and capital stock. Selling second hand military weaponry is recorded as negative intermediate consumption (and thus not as sales of capital assets).
- A major part of consumption of fixed capital may refer to consumption of infrastructure, like roads, dikes and bridges.
- Employer's social contributions are imputed for unfunded social benefits. This is important for international comparability of compensation of employees, value added and Domestic Product. In some countries, e.g. the Netherlands, the pensions of civil servants are funded, i.e. they have to pay pension contributions to a pension fund. However, in other countries, civil servants receive also pensions, but no contributions are actually paid to a pension fund. The imputation records pension contributions by the employer as if there is a pension fund.
- The government does not only receive taxes, but pays also taxes itself. Non-deductible VAT is include in the value of intermediate consumption. Also other taxes on production are paid by the government. Cases in point are real estate tax, motor vehicle tax and environmental levies.
- The government does not only grant subsidies, but can also receive subsidies, in particular other subsidies on production. The major example is wage subsidies, e.g. wage subsidies for employing long-term unemployed.

The allocation of primary income account shows the government as lever of taxes on production or imports. It also shows the government granting subsidies.

Taxes are mainly restricted to explicit taxes. However, taxes include also:

- the profits of import and export monopolies;
- implicit taxes resulting from the operation of an official system of multiple exchange rates.

Subsidies are also confined to explicit subsidies. This includes wage subsidies in the form of a reduction of employers' social security contributions. Implicit or indirect subsidies are excluded. Cases in point are the remission of income taxes for industrial Research and Development, low VAT-rates on some products (e.g. on wine in a wine-producing country) or charging no market prices for services from a public corporation, e.g. for energy.



The property income receivable include dividends from public corporations and rents on land and subsoil assets. These rents reflect the prominent role of the government as owner of land and subsoil assets, like mineral reserves, oil and natural gas. Revenue on subsoil assets may also be hidden in the dividends received, as public corporations are often involved in exploiting subsoil assets. The property income payable includes interest on government debt.

The secondary distribution of income account shows the redistribution of income by the government. The major income transfers received are social security contributions, current taxes on income, wealth, etc. and transfers within the sector government, e.g. municipalities receiving transfers from the ministries. The major income transfers paid are social security benefits in cash, social assistance benefits in cash and transfers to the rest of the world. The transfers to the rest of the world will mainly include development aid and contributions to international organisations like the UN, NATO and the EU.

A specific issue is the time of recording and valuation of taxes. In principle, the national accounts is recorded on an accrual basis and this applies also to taxes. Taxes include only amounts due for payment evidenced by tax assessments. These should create liabilities in the form of clear obligations to pay on the part of taxpayers. Taxes include also assessments which are never paid, e.g. because of bankruptcy. The writing-off of bad debt is recorded as an other change in the volume of the governments' financial assets. The cancellation of tax claims by mutual agreement is recorded as a capital transfer by the government and as a simultaneous extinction of the claim. Fines and interest on tax claims are not regarded as taxes, but as other income transfers (fines) and property income (interest).

Social assistance benefits and other income transfers to households do not include tax expenditures. Cases in point are lower tariffs for elderly people and families with children, deduction of expenditure on healthcare and child-care in calculating taxable income, fiscal advantages for owners of dwellings and exemption of some local taxes for families on social security.

The use of disposable income account shows final consumption expenditure. The breakdown given also shows the redistribution of income in kind, i.e. the social security benefits in kind via market producers, the social assistance benefits in kind via market producers and the individual part of the other non-market output by the government.

### *The capital account*

The capital account shows the accumulation of non-financial assets and the redistribution of capital.

The (net) acquisition of other non-financial assets is likely to be a revenue for the government, as the value of the disposals is likely to surpass the value of acquisition. There are several reasons for this. First, land purchased by the government is usually cheaper than land sold by the government. Land sold is often first drastically restructured with new infrastructure and then sold in small parcels. Secondly, subsoil assets, patents and licences are probably more sold than bought by the government. Some licences can only provided by the government, e.g. licences for the use of telecom-frequencies.

The capital transfers received consist of three categories: capital taxes like inheritance duties, capital transfers within general government and other capital transfers. The latter two categories are mixtures of two official categories: investment grants and other capital transfers, e.g. transfers to public corporations to cover accumulated losses.

### *Supplementary table: revenue and expenditure by the government*

The resources and uses of the government according to the international guidelines contain a substantial amount of repeated recording of the same transactions. They are therefore not very useful in analysing government finance. For this important purpose, the resources and use should first be translated into revenue and expenditure of the consolidated government (see table 6.4d). This can be done in four simple steps:

- delete the imputations on both sides, i.e. other non-market output, imputed employer's social contributions, own-account capital formation and consumption of fixed capital (this is a double-counting with capital formation);

- record the negative uses, i.e. subsidies received and the acquisition of other non-financial assets, as revenues.
- consolidate the flows within general government. This implies in particular delete the substantial income and capital transfers within general government. These transfers are a major source of finance for other expenditure. Therefore only these other expenditure should be included in a measure of expenditure excluding double-counting. Four other flows could also be consolidated: interest payments, actual market output, subsidies and taxes.
- group similar revenue and expenditure, e.g. group all taxes in order to show total taxes received by the government.

The Polderland-statistics give a clue to the quantitative importance of the first three steps:

- the imputations are 143 billion euros (116+8+19) in 2007. This is over 40% of consolidated revenue and expenditure;
- the negative uses are 5 billion euros in 2007. This is less than 2% over consolidated revenue and expenditure.
- the income and capital transfers within general government are 110 billion euros in 2007. This is over 25% of consolidated revenue and expenditure.

The table on revenue and expenditure shows the relative importance of specific types of revenue and expenditure. For example, in Polderland, taxes and social security contributions account for 85% of total revenue in 2007. Similarly, interest payments on government debt (property income payable) accounts for 11% of total expenditure.

The distinction between current and capital can also be applied to the expenditure. However, for this purpose, we need two imputations from the accounts, i.e. consumption of fixed capital and own-account capital formation. Consumption of fixed capital should be regarded as part of the current expenditure, while the expenditure on own-account capital formation (e.g. the compensation of employees involved) should not. The capital expenditure are then defined in the opposite way. Consumption of fixed capital should be deducted and own-account capital formation should be added. The balancing item of the current expenditure and revenue is then saving. The balancing item of all expenditure and revenue is net lending. These balancing items are identical to those in the accounts. The table on revenue and expenditure is therefore also a simple tool for analysing saving and net lending by the government.

The revenues and expenditures of government can also be expressed as percentages of Domestic Product or National Income. This is demonstrated in the last column of table 6.4d. This reveals that the government revenue are 54% of National Income. The major revenues are taxes (28%) and social security contributions (18%). Similarly, total government expenditure was 55% of National Income. As a result, the government deficit amounted to 1% of National Income.

#### *Supplementary table on taxes*

The table can also be used as a starting point for showing further detail on some specific transactions or a grouping of transactions. This allows to show the link between the national accounts description and the specific institutions and regulations in a country. This applies for example to taxes. Table 6.5e provides an overview of the size and composition of taxes paid by residents. In Polderland, value added tax, wage tax and corporation tax are the biggest taxes. Together they account for about 75% of all taxes. Most of these taxes are paid to the domestic government. However, also some taxes are paid to non-resident governments, e.g. the European Union or the government of countries in which residents work or invest their capital.

Table 6.5f shows the size and composition of taxes on production and imports into taxes on products and other taxes on production. In Polderland over 90% of the taxes on production and imports are taxes on products. The most important taxes on products are value added tax and excise duties.

Table 6.5g shows the size and composition of current taxes on income, wealth, etc. This includes breakdown into current taxes on income and current taxes on wealth etc. Corporation tax and wage tax are by the far the biggest taxes involved. These current taxes on income account for nearly 90% of the total current taxes on income, wealth, etc.

#### *Government expenditure by function*

The functional classification for the government (COFOG) groups government expenditure by purpose (see table 6.5e). Ten different purposes (functions) are distinguished. The functional classification shows the amount of expenditure on each purpose. For example, in Polderland in 2008 32 billion euro was spent on education, while expenditure on defence amounted to 12 billion euro.

For each function also the expenditure mix can be presented. Table 6.5f shows the expenditure mix for social protection. This consists not only of social benefits, but also of various overhead costs (e.g. compensation of employees of the institutions distributing social benefits) and subsidies (e.g. wage subsidies for employing long-term unemployed). Similarly, the function education can be served by overhead costs for administering the national education system and by production of education services by government units (expenditure related to production), but also by scholarships or investment grants to schools. Expenditure which are difficult to allocate to specific purposes are classified in public administration. This applies in particular to interest on government debt.

The functional classification can also be used to classify revenues of the government provided that they are earmarked for some specific purpose. For example, school fees serve the function education, garbage disposal fees and environmental levies serve the function environment protection and social security contributions serve the function social protection.

The functional classification plays a special role for final consumption expenditure. The classification of government final consumption expenditure by function (COFOG) is linked to the functional classification for final consumption expenditure by households (and Non-profit institutions serving households; COICOP). In this way, the final consumption of the national economy is classified by function. This shows the relative importance of the different sectors in the final consumption of each function. For example, the relative importance of the government vis-à-vis households with respect to the functions health and education. This will also be discussed in section 6.6.

#### *Supplementary table on prices, volumes and key ratios*

The table on prices, volumes and key ratios (table 6.5j) contains to a great extent the same variables as used for the sectors non-financial corporations and financial corporations. The major differences are to be found in the key ratios. For the government as an other non-market producer, the net return on investments is not important. However, several key ratios on the importance of government finance have been introduced. The key ratios cover the expenditure (total and final consumption expenditure), the revenue (total and taxes and social security contributions), the deficit and the debt of the government in terms of Net National Income.

### **6.5.2 Discussion**

In this section the following seven topics will be discussed:

- the sector government;
- government accounts and national accounts;
- the valuation of government output;
- capital formation and capital stock by the government;
- final consumption expenditure by the government;
- taxes, subsidies and social benefits;
- government deficit;
- government debt and net worth.

For each topic the relevance of the standard national accounts will be investigated. This includes various perspectives, e.g. the relationship with economic theory, data, the international comparability and the use for government policy.

### *Delimitation of the sector government*

Some major drawbacks of the delimitation of the sector government (see our discussion of the sectors non-financial and financial corporations) have been remedied by the introduction of the public sector. The latter includes also the central bank, quasi-corporations of the government and corporations controlled by the government. The two sector concepts complement each other and are a strong couple.

The sector government and public sector reflect the institutional structure of a country. For example, the schools and universities of a country can be inside or outside the sector government. This depends on whether they are run on a commercial basis or not. Commercial private schools operate outside the public sector. The same possibilities apply to garbage disposal units. When a garbage disposal unit of a municipality does not qualify for quasi-corporation, it is part of the sector government. When it qualifies as quasi-corporation, it is outside the sector government but inside the public sector. When the garbage disposal unit is a private corporation not controlled by the government, it is outside the sector government and also outside the public sector. So, the sector government and the public sector describe the role played by the government in a country. Differences in institutional structure are reflected in differences in the size and composition of the sector government and the public sector.

Differences in the roles played by government can be revealed by the functional classification. For example, when schools are outside the sector government, the government only has small final consumption expenditure on education. An alternative way is to make an industry-breakdown of the output and value added of the sector government.

In the universal guidelines (SNA93), the distinction between market and other non-market producers is only defined in very general terms (an other non-market producers sells output at economically not significant prices). This leaves plenty of room for different interpretations by different countries. This applies therefore also to the delimitation of the other non-market producers that pertain to the sector government. The European unification puts strong requirements on the comparability and harmonisation of national accounts figures in general, and those for the sector government in particular. Therefore, in the European guidelines (ESA95), the definition of other non-market producers has been clarified and made more concrete (e.g. by adding a 50% rule: the sales by an other non-market producer should generally cover less than 50% of the production costs).

### *Accounts of government bodies*

The accounts of government bodies have much in common with the presentation in the national accounts. They usually consist of two tables: a balance sheet and a table showing revenue and expenditure. The items distinguished are often rather similar to those in the national accounts, e.g. taxes, wages and capital formation. Furthermore, tables allocating expenditure to functions or products are also a common instrument. Finally, tax-expenditures are also generally not recorded.

Nevertheless, there are often also substantial differences. A first important difference is that the concepts used in the standard national accounts are much more standardised nationally, internationally and over time than those in the government accounts. In some countries, the accounts of all government bodies are standardised. However, in most countries substantial difference exist in the accounting procedures applied by the various bodies, e.g. among the ministries and the municipalities.

A second difference is that the accounts of government bodies are usually much simpler and less sophisticated than that of the national accounts. For example, the accounting structure does not show value added as a balancing item and often no distinction between a current and capital account is made. Deflated values and key-ratios are often absent.

A third difference is that the delimitation of the concepts and their time of recording (cash versus accrual) can differ from those in the national accounts. Common differences in

delimitation occur with respect to income in kind (usually not recorded), capital consumption (often at historical costs or sometimes even absent), taxes (often including some fees, like garbage disposal fees), the recording of internal flows (e.g. sales or interest charged by one part of the municipality to another part of the same organisation) or the recording of the costs of a project including interest foregone.

A fourth difference is that the imputed resources and uses of the national accounts are absent. Major cases in point are other non-market output and imputed social contributions.

#### *Valuation of government output*

In the standard national accounts, government output is valued by assuming an operating surplus of nil. This implies that the costs of production of the government do not include any financial costs, e.g. interest payments. From the point of view of the concept of opportunity costs, this is rather strange. For example, in the absence of wear and tear and economic obsolescence, annual opportunity costs of large investments in infrastructure are at least equal to interest revenues foregone on the financial capital invested.

The consequence of such an alternative convention would be that the costs of capital formation, in particular those with long lifetimes and therefore a low annual rate of capital consumption, substantially increases. This can give an entirely different picture of the costs of providing government services in general. It shows in particular that capital-intensive services, like the provision of rail and road infrastructure by the government, are much more expensive than suggested by the present convention.

The present convention also gives a false picture of the savings due to contracting out. It punishes business sense by the government, as it assumes there are only financial costs when a task is contracted out. This implies that contracting out of the provision of infrastructure will most likely drastically increase the production costs of the government. This can be true even when business sense indicates that substantial savings have been made. Business sense would be much better reflected by including interest revenues foregone.

Our Polderland statistics can give a clue to the quantitative importance of the issue. The value of the non-financial capital stock was 780 billion euros in 2007. Multiplication by the long-term interest rate of 5,2%, results in an annual opportunity cost of 41 billion euros. An operating surplus equal to this opportunity costs would thus increase value added, output and final consumption expenditure of the government by 41 billion euros. This implies an increase in value added by over 50% and in final consumption expenditure by nearly 25%! Furthermore, the functions defence and economic affairs will be much more important, as they are relatively capital-intensive (economic affairs includes most of the investments in infrastructure).

#### *Capital formation and capital stock*

Expenditure on *military weaponry* is not recorded as capital formation but as intermediate consumption. This convention is defended on moral grounds and by pointing to differences in longevity between military weaponry and other fixed assets. However, the latter is not very convincing in view of evidence from the Second World War: military as well as non-military durables were destroyed on a massive scale. The convention with respect to military weaponry is inconsistent with recording current military expenditure as output: how can provision of defence and security, while military weapons are not regarded as fixed capital goods? Defence and security are provided not only in war time, but also in peace time. It seems reasonable to state that actual warfare and destruction is not the purpose of military expenditure in most countries. Therefore, there exists a strong case for recording expenditure on military weaponry as capital formation.

For countries like Polderland in 2007, treating expenditure on military weaponry as capital formation would hardly matter, as the amounts involved are relatively small. Intermediate consumption would decrease and capital formation would increase with 3 billion euros. Capital consumption would increase somewhat more than intermediate consumption decreases. Saving would only be affected by the difference.

In theoretical economics, the concept of *human capital* has received wide attention. This is evidenced by awarding Gary Becker, one of the pioneers of human capital theory, the Nobel price in economics in 1992. New growth theory is now being used for investigating the macro-economic spill-over effects of human capital. In development economics, it is even the general opinion "that the formation of human capital is important, perhaps even central, to the development effort in poor countries. When increased productivity results from formal education, health and nutrition, effective job search, migration or on-the job training, we see the results of past investments in human capital. Abstention from consumption (saving) and expenditure to increase investment together yield returns in future periods, just as investments in physical capital would yield returns" (Herrick and Kindleberger, 1984, p. 193). Large changes in the age structure of a country can even necessitate a large increase in government expenditure on formal education.

In the standard national accounts, the provision of formal education by the government not financed by sales (e.g. school fees) is directly included in government final consumption expenditure. Recording government expenditure on education as capital formation by the government does not seem very meaningful, as the government does not own this human capital and does not use their services as inputs for their production processes. Therefore, in order to incorporate the insights of human capital theory, expenditure on education should be recorded as capital formation by households. This can be achieved by:

- recording all sales of education to households as capital formation by households;
- recording the other non-market output of education as investment grants in kind by the other non-market producer and as capital formation by households.

According to human capital theory, the investments in education yields returns in the form of higher wages. However, a major convention in the standard national accounts is that wages are regarded as payment for factor services and not as payments for the outputs of a production process. As a consequence, without taking this next step, recording expenditure on education as human capital formation by households does not seem very meaningful, as the corresponding production process is not recorded at all. A more appropriate solution to do justice to human capital theory is therefore to draw up a separate human capital satellite. Such a satellite is described and discussed in section 6.9.

#### *Taxes, subsidies and social benefits*

Tax expenditures, i.e. benefits provided by the government in the form of lower than standard tax rates, are not included in subsidies and social benefits. This is a serious problem for the relevance and comparability of these concepts:

- tax expenditures can be quantitatively very important;
- subsidies and social benefits can be replaced by tax expenditure and vice versa;
- countries differ substantially in the size and composition of tax expenditure.

There are some good grounds for not including tax expenditure in the core of the accounting system:

- they can only be measured indirectly, as they are generally not made explicit in the administration of the government, corporations and households.
- the concept of tax expenditure is not without problems and extremely country-specific. Tax expenditure can only be calculated by referring to a standard tariff for a standard situation. However, determining the standard tariff and the standard situation is not always easy.
- it pollutes the standard system with imputations.

However, not taking the issue of tax expenditure serious invites misuse of national accounts statistics. We therefore propose that countries draw up a supplementary standard table including their best estimates for tax-expenditure. This puts subsidies and social benefits in a more balanced perspective and stimulates to draw sound conclusions from the statistics.

According to economic theory, import quota can have the same effects as import duties. However, in the standard national accounts only import duties are recorded. More in general, the standard national accounts only describes government policy as far as it is directly observable in the revenue, expenditure or financial transactions of the government. It does not explicitly record the consequences of qualitative government policy measures, like import

quota, regulations on working conditions and administrative requirements for starting or running a company.

Social benefits are recorded gross in the national accounts, i.e. no deductions are made for taxes and social security contributions to be paid on the social benefits. This is also a serious problem for comparability; in most countries social benefits are in fact also net, but in some countries like the Netherlands there is a substantial difference between the gross and net social benefits. Comparison on the basis of the national accounts figures overstates therefore the expenditure by the latter countries. Correcting for this gross-effect drastically changes the international comparison. For example, in 1993, in the Netherlands direct taxes and social contributions levied on social benefits amounted to 6.5% of GDP, while this percentage was only 0.2% in the UK and 0.1% in the United States (W. Adema, 1997). For countries where this is relevant, also a supplementary table with net social benefits can be drawn up.

All issues discussed above (e.g. tax expenditure or including interest revenues foregone) have in common that they shed a different light on government revenue and expenditure. They have also in common that they do not affect government deficit, i.e. net lending by the government. However, from an analytical point of view, also government deficit can be criticised.

### *Government deficit*

Interest on government debt in nominal terms includes a remuneration for the loss of purchasing power of the debt, i.e. the neutral holding losses on the debt. This implies that a meaningful concept of government deficit should only regard the difference between the interest paid and the neutral holding gains (pure interest) as expenditure. The same reasoning applies of course to interest paid on nominal debt.

Our Polderland-statistics give a clue to the quantitative importance of the issue for a country with a substantial government debt in nominal terms (87 % of National Income) and a relatively low rate of inflation (2,2%). In 2007 interest paid includes an ex post calculated compensation of 13 billion euros for inflation losses on the capital outstanding of the creditor (the neutral holding losses on liabilities). Correcting government expenditure for this reduces expenditure by 13 billion euros. Interest paid includes a compensation of 2 billion euros to ensure a neutral holding gain by the government on its financial assets. This reduces revenue by 2 billion euros. The net effect is that government deficit decreases by 11 billion euros, i.e. changes from a deficit of 8 into a surplus of 3 billion euros. In terms of National Income, this is the difference between a deficit of 1,3% and a surplus of 0,5%.

### *Government debt and net worth*

In the national accounts, liabilities do not include implicit liabilities, i.e. liabilities not recognised as such by the government administration. From an economic theoretic point of view, these implicit liabilities can be formulated as the expected net discounted liabilities. A major case in point concerns claims on future pensions by civil servants for which the government has not instituted a funded scheme. These claims can be very substantial. Their non-recognition distorts the comparability of national accounts figures on government debt and net worth, because:

- unfunded pension claims can differ substantially among countries, e.g. because there are countries with and without pension funds for civil servants.
- countries may change from an unfunded towards a funded scheme. This amounts to paying off these old liabilities.
- governments may use the reserves of the pension fund for other purposes. In this way, the pension fund can become under funded.

Implicit liabilities can also pertain to subsidies. Such implicit liabilities become explicit when the government starts to buy them off. This can drastically affect flows, stocks and balancing items recorded in the national accounts. For example, in the Netherlands in 1995 the annual subsidies to housing corporations were bought off for a lump sum amount of 33 billion euros. This incidentally increased government deficit by 5 percent point of National Income.

In principle, implicit liabilities should include all expected future government expenditure. This would amount to discounting not only future pension claims and subsidies, but also other social benefits, compensation of employees, capital formation, etc.

A similar approach can be used for the asset side, i.e. discount all expected future revenue, like property income, taxes, social security benefits and sales. From an economic theoretic point of view, only such an approach would result in the right size of the assets, liabilities and net worth of the government.

In the national accounts, only explicit assets are recorded as assets. This includes subsoil assets, which are in the absence of observed prices valued at the present value of expected returns. Implicit assets like expected tax revenue and expected social security benefits are not recorded.

Calculating the value of implicit liabilities and assets is not without problems, as:

- the calculations require concrete scenarios for the future about all that is relevant for government revenue and expenditure.
- the calculations depend critically on the assumptions made, the scenarios chosen and discount rate used.

Nevertheless, these tentative calculations can be important supplementary information for data users. This applies in particular to the estimation of unfunded pension claims.

A related issue is generational accounting (see Kotlikoff, 1993). It regards the government as a re-distributor of income between different generations and tries to quantify this. To this end, all past and future government revenue and expenditure have to be allocated to the generations that pay for these revenue or that benefit from these expenditure. Information on past revenue and expenditure can be obtained from the national accounts. However, in quantifying future revenue and expenditure in fact the implicit liabilities and assets are to be estimated. Generational accounting can also be used to analyse the sustainability of the government deficit, e.g. to calculate the consequences of an ageing population for government finance.

### 6.5.3 Summary

The standard national accounts describe the general government in terms of a coherent set of accounts in current prices with some explicit links to prices, volumes and real values and with a table classifying government expenditure by function. This description has much in common with the government accounts, e.g. the presentation in terms of accounts and the terminology. Nevertheless, there are also four important differences:

- The national accounts are much more standardised nationally, internationally and over time.
- The national accounts distinguish much more accounts and balancing items, include also balance sheets and a link to prices and volumes.
- The concepts in the national accounts differ substantially with respect to delimitation, valuation and time of recording.
- The national accounts presentation contains a substantial amount of double-counting, e.g. other non-market output.

These differences reflect to a great extent two differences in purposes. The first difference pertains to the need to standardisation. Standardisation of the national accounting concepts is essential for obtaining meaningful and comparable totals on the government. International and national standardisation of the government accounts is less essential.

The second difference is that the national accounts describe the government as part of a consistent description of the national economy; this is no purpose of the government accounts. However, describing the government as a fully consistent part of the national economy has also clear disadvantages. From the point of view of data users mainly interested in government finance as such, the standard national accounts description contains an excessive number of accounts, is not very comprehensible and contains sub-optimal concepts.



The only way to remedy this lack of relevance for government finance is to present supplementary ad hoc tables. These tables should be simpler, closer to the perception of government finance and partly inconsistent with the standard national accounting concepts of the whole system. In Europe, supplementary concepts on government revenue and expenditure have been defined recently. Certain simplifications can also be found in the IMF Government Finance Statistics Manual, which can be regarded as a satellite of the SNA93. The Polderland-tables show how the European concepts can be used for a simple overview-table on government finance.

The comparison with economic theoretic concepts indicates that the standard national accounts are a description with some specific theoretical elements, e.g. real holding gains are part of the accounting structure. Furthermore, the standard national accounts also employs major basic distinctions present in economic theory, e.g. the distinction between a sale and a tax by the government or the distinction between non-financial transactions and financial transactions.

However, the standard national accounts are also in major respects substantially different. For example, from an economic theoretic point of view tax expenditure should also be regarded as expenditure, redistribution of income should be recorded over life time, implicit liabilities should be made explicit, expenditure on education should be recorded as capital formation and the production costs of the government should include the interest revenues foregone on the financial capital invested.

Furthermore, the notion of prices and volumes should be extended to cover not only final consumption expenditure and capital formation by the government but all government expenditure, e.g. also social benefits in cash.

The national accounts description of the government is not a direct reflection of what can be readily observed. It transforms what can be readily observed into a well-structured model including a substantial amount of double-counting and imputation.

The Polderland-tables illustrate how the standard national accounts can be made more comprehensible and more relevant, e.g. by explicitly showing the various imputations, by adding various key-ratios and by drawing up a table on government revenue and expenditure focused on the analysis of government finance.

Furthermore, some changes in the basic concepts are required. The treatment of military weaponry as intermediate consumption and the assumption of a net operating surplus of nil should be changed in the next generation of guidelines. The central bank should become part of the sector government.

## 6.6 Households

### 6.6.1 Description

#### *Delimitation of households*

Households are one of the major groups of economic actors in the national economy. Their principal roles are those of consumers, employees and unincorporated producers. The Polderland-statistics can be used to illustrate their importance. Households are responsible for 16% of Domestic Product and about 20% of domestic employment. Compensation of employees received by households amounts to about 60% of National Income. Actual final consumption is about 85% of National Income.

The sector households includes a wide range of individuals and households. It includes:

- Individuals or households whose principal function is consumption;
- Persons living permanently in institutions, like old persons living in retirement homes and prisoners serving long sentences;
- Individuals or households that produce mainly for own consumption, e.g. self-subsistence farmers or those that own and occupy their own dwelling;
- Sole proprietorships and partnerships without independent legal status. However, quasi-corporations are excluded. This applies e.g. to a big textile company fully owned and controlled by one family.
- Non-profit institutions serving households without independent legal status or that are of minor importance.
- Seasonal workers who leave the country for several months;
- Tourists, patients, students, businessmen and crew members who travel abroad;
- The official representatives of the government working abroad, e.g. at embassies or military bases.

The guidelines recommend distinguishing six subsectors:

- Employers and own-account workers;
- Employees;
- Recipients of property incomes;
- Recipients of pensions;
- Recipients of other transfer incomes, e.g. social assistance benefits;
- Others.

Households are allocated to sub-sectors according to the largest income category of the household as a whole.

In our Polderland-statistics, only tables are shown for the whole sector households.

#### *The tables*

The role of the households is described by nine tables (tables 6.6a-6.6i):

1. a current account;
2. an accumulation account;
3. a balance sheet;
4. a table showing adjusted disposable income and actual final consumption;
5. a table showing actual final consumption by function;
6. a table showing final consumption expenditure by product;
7. a table showing disposable income in cash and final consumption expenditure in cash;
8. a table on revenue and expenditure by households;
9. a table with prices, volumes and key-ratios.

The first three tables are in many respects similar to those for the non-financial corporations. In this section, we will focus on what is most characteristic for households, i.e. their concepts of output, disposable income and final consumption.

Table 6.6a Current account for Households

	2007	2008	08-07	08/07
I. Production account				
R Output at basic prices	199	209	10	5.0%
actual market output	167	176	9	5.4%
own-account capital formation	2	2	0	0.0%
output for own-final consumption	30	31	1	3.3%
services of owner-occupied dwellings	29	30	1	3.4%
other output	1	1	0	0.0%
U Intermediate consumption	78	80	2	2.6%
Consumption of fixed capital	22	23	1	4.5%
Net value added at basic prices	99	106	7	7.1%
II.1.1 Generation of income account				
R Net value added at basic prices	99	106	7	7.1%
U Compensation of employees	27	28	1	3.7%
Other taxes on production	2	2	0	0.0%
minus: Other subsidies on production	-3	-1	2	-66.7%
Operating surplus/ Mixed income	73	77	4	5.5%
operating surplus on owner-occ.dwellings	19	20	1	5.3%
income of officially registered self-employed	44	45	1	2.3%
other mixed income	10	12	2	20.0%
II.1.2 Allocation of primary income account				
R Net operating surplus/mixed income	73	77	4	5.5%
Compensation of employees	372	392	20	5.4%
Property incomes receiveable	89	95	6	6.7%
interest	15	17	2	13.3%
dividends	12	13	1	8.3%
withdrawals from quasi-corporations	2	2	0	0.0%
property income of insurance policy holders	60	63	3	5.0%
life	11	12	1	9.1%
pension	47	49	2	4.3%
other private social and casualty	2	2	0	0.0%
U Property incomes payable	37	40	3	8.1%
interest	36	39	3	8.3%
rent on land and subsoil assets	1	1	0	0.0%
Balance of primary incomes	497	524	27	5.4%

Table 6.6a Current account for Households (continued)

	2007	2008	08-07	08/07
II.2 Secondary distribution of income account				
R Balance of primary incomes	497	524	27	5.4%
Current transfers in cash receiveable	173	177	4	2.3%
social security benefits in cash	72	69	-3	-4.2%
funded pension benefits	33	35	2	6.1%
other funded social insurance benefits	3	2	-1	-33.3%
unfunded employee social benefits	16	20	4	25.0%
social assistance benefits in cash	21	22	1	4.8%
casualty insurance claims	17	19	2	11.8%
other current transfers receiveable	11	10	-1	-9.1%
U Current transfers in cash payable	288	300	12	4.2%
social security contributions	114	118	4	3.5%
contributions for funded pension schemes	68	72	4	5.9%
<i>actual (service charge deducted)</i>	21	23	2	9.5%
<i>imputed</i>	47	49	2	4.3%
other contributions for funded social ins. schemes	3	2	-1	-33.3%
imputed employers' social contributions	18	20	2	11.1%
current taxes on income, wealth, etc.	57	59	2	3.5%
net casualty insurance premiums	17	20	3	17.6%
other current transfers payable	11	9	-2	-18.2%
Disposable income	382	401	19	5.0%
II.4 Use of disposable income account				
R Disposable income	382	401	19	5.0%
Correction for pension fund reserves	35	37	2	5.7%
U Final consumption expenditure	362	384	22	6.1%
<i>use of actual market output</i>	313	333	20	6.4%
<i>use of imputed market output (insurance)</i>	19	20	1	5.3%
use of output for own-final consumption	30	31	1	3.3%
<i>services of owner-occupied dwellings</i>	29	30	1	3.4%
other	1	1	0	0.0%
Saving	55	54	-1	-1.8%

Table 6.6b Accumulation accounts for Households

		2007	2008	08-07	08/07
	III.1. Capital account				
A	Gross capital formation	48	50	2	4.2%
(=U)	minus: Consumption of fixed capital	-22	-23	-1	4.5%
	Acquisition of other non-financ. assets	2	2	0	0.0%
	Capital transfers payable	7	7	0	0.0%
	capital taxes	2	2	0	0.0%
	other capital transfers	5	5	0	0.0%
L	Saving	55	54	-1	-1.8%
(=R)	Capital transfers receiveable	2	3	1	50.0%
	Net borrowing	-22	-21	1	-4.5%
	III.2 Financial account				
A	Net acquisition of financial assets	94	92	-2	-2.1%
	insurance technical reserves	53	57	4	7.5%
	other financial assets	41	35	-6	-14.6%
L	Net incurrence of liabilities	72	71	-1	-1.4%
	Net lending	22	21	-1	-4.5%
	III.3 Other changes in assets account				
A	Other changes in non-financial assets	108	134	26	24.1%
	volume changes	-12	-14	-2	16.7%
	nominal holding gains	120	148	28	23.3%
	neutral holding gains	39	13	-26	-66.7%
	real holding gains	81	135	54	66.7%
	Other changes in financial assets	151	166	15	9.9%
	volume changes	1	2	1	100.0%
	nominal holding gains	150	164	14	9.3%
	neutral holding gains	40	14	-26	-65.0%
	real holding gains	110	150	40	36.4%
L	Other changes in liabilities	-2	-2	0	0.0%
	volume changes	-2	-3	-1	50.0%
	nominal holding losses	0	1	1	
	neutral holding losses	10	4	-6	-60.0%
	real holding losses	-10	-3	7	-70.0%
	Net other changes in assets	261	302	41	15.7%

Table 6.6c Balance sheets for Households

	2007	2008	08-07	08/07
IV.1 Opening balance sheet				
A Non-financial assets	1790	1926	136	7.6%
Financial assets	1808	2053	245	13.6%
insurance technical reserves	960	1082	122	12.7%
other financial assets	848	971	123	14.5%
L Liabilities	471	541	70	14.9%
Net worth	3127	3438	311	9.9%
<i>P.M. Household durables</i>	<i>400</i>	<i>438</i>	<i>38</i>	<i>9.5%</i>
IV.2 Changes in balance sheet				
A Changes in non-financial assets	136	163	27	19.9%
Changes in financial assets	245	258	13	5.3%
insurance technical reserves	122	201	79	64.8%
other financial assets	123	57	-66	-53.7%
L Changes in liabilities	70	69	-1	-1.4%
Changes in net worth	311	352	41	13.2%
<i>P.M. Change in household durables</i>	<i>38</i>	<i>41</i>	<i>3</i>	<i>7.9%</i>
<i>net purchases</i>	<i>79</i>	<i>87</i>	<i>8</i>	<i>10.1%</i>
<i>minus: capital consumption</i>	<i>-60</i>	<i>-66</i>	<i>-6</i>	<i>10.0%</i>
<i>plus: other changes in the volume</i>	<i>-2</i>	<i>-2</i>	<i>0</i>	<i>0.0%</i>
<i>plus: nominal holding gains</i>	<i>21</i>	<i>22</i>	<i>1</i>	<i>4.8%</i>
IV.3 Closing balance sheet				
A Non-financial assets	1926	2089	163	8.5%
Financial assets	2053	2311	258	12.6%
insurance technical reserves	1082	1283	201	18.6%
other financial assets	971	1028	57	5.9%
L Liabilities	541	610	69	12.8%
Net worth	3438	3790	352	10.2%
<i>P.M. Household durables</i>	<i>438</i>	<i>479</i>	<i>41</i>	<i>9.4%</i>

Table 6.6d Adjusted disposable income and actual final consumption

	2007	2008	08-07	08/07
Disposable income of hh	382	401	19	5.0%
plus: Transfers in kind (=individual gov. consumption)	89	92	3	3.4%
via market producers: social security benefits in kind	46	48	2	4.3%
via market producers: social assistance benefits in kind	8	8	0	0.0%
individual other non-market output	35	36	1	2.9%
is equal to				
Adjusted disposable income of hh	471	493	22	4.7%
Final consumption expenditure of hh	362	384	22	6.1%
plus: Transfers in kind	89	92	3	3.4%
is equal to				
Actual final consumption of hh	451	476	25	5.5%

Table 6.6e Household final consumption expenditure by product-group

	2007	2008	2008 comp.
1 Products of agriculture, forestry and fishing	9	10	3%
2 Products from mining and quarrying	0	0	0%
3 Manufactured products	147	153	40%
food, beverages & tobacco	56	57	15%
textile, clothing, leather, wood, paper	37	40	10%
fuel	14	14	4%
vehicles	14	16	4%
other	26	26	7%
4 Electrical energy, gas, steam and hot water	15	15	4%
5 Construction	1	1	0%
6 Repair	8	9	2%
7 Hotel and restaurant services	24	26	7%
8 Transport and communication services	21	24	6%
9 Financial intermediation services	22	23	6%
banking services	3	3	1%
insurance services	19	20	5%
10 Real estate, renting and business services	72	78	20%
<i>services of owner-occ. dwellings</i>	29	30	8%
other	43	48	13%
11 Public administration	1	1	0%
12 Education	3	3	1%
13 Health and social work	17	17	4%
14 Other social and personal services	22	24	6%
Household final consumption expenditure	362	384	100%
non-durable goods	74	76	20%
semi-durable goods	19	16	4%
durable goods	79	87	23%
services	190	205	53%

Table 6.6f Households actual final consumption and final consumption expenditure by function (incl. supplementary detail)

	2007	2008	07/06 volume	08/07 volume	2008 comp.
1 Food and non-alcoholic beverages	44	45	2.3%	0.2%	9%
2 Alcoholic beverages, tobacco, etc.	12	12	0.6%	-0.3%	3%
3 Clothing and footwear	22	24	3.1%	5.4%	5%
4 Housing, water and fuel	79	83	0.2%	1.7%	17%
<i>final consumption expenditure</i>	76	80			17%
<i>transfers in kind</i>	3	3			1%
<i>social security benefits in kind via market producers</i>	0	0			0%
<i>social assistance benefits in kind via market producers</i>	3	3			1%
<i>individual other non-market output</i>	0	0			0%
5 Furnishings, household equipment, etc.	25	27	2.7%	6.4%	6%
6 Health	42	45	12.2%	2.9%	9%
<i>final consumption expenditure</i>	14	15			3%
<i>transfers in kind</i>	28	30			6%
<i>social security benefits in kind via market producers</i>	27	29			6%
<i>social assistance benefits in kind via market producers</i>	0	0			0%
<i>individual other non-market output</i>	1	1			0%
7 Transport	43	46	4.2%	6.3%	10%
8 Communications	9	11	15.9%	23.8%	2%
9 Recreation and culture	46	51	4.3%	7.7%	11%
<i>final consumption expenditure</i>	43	48			10%
<i>transfers in kind</i>	3	3			1%
<i>social security benefits in kind via market producers</i>	0	0			0%
<i>social assistance benefits in kind via market producers</i>	0	0			0%
<i>individual other non-market output</i>	3	3			1%
10 Education	31	32	2.8%	3.2%	7%
<i>final consumption expenditure</i>	2	2			0%
<i>transfers in kind</i>	29	30			6%
<i>social security benefits in kind via market producers</i>	0	0			0%
<i>social assistance benefits in kind via market producers</i>	2	2			0%
<i>individual other non-market output</i>	27	28			6%
11 Hotels and restaurants	21	22	3.9%	3.8%	5%
12 Social protection	32	33	-7.0%	2.6%	7%
<i>final consumption expenditure</i>	6	7			1%
<i>transfers in kind</i>	26	26			5%
<i>social security benefits in kind via market producers</i>	19	19			4%
<i>social assistance benefits in kind via market producers</i>	3	3			1%
<i>individual other non-market output</i>	4	4			1%
13 Other goods and services	45	45	6.2%	5.1%	9%
Total actual final consumption	451	476	2.9%	4.0%	100%
<i>final consumption expenditure</i>	362	384	2.6%	4.1%	81%
<i>transfers in kind</i>	89	92	4.0%	3.6%	19%
<i>social security benefits in kind via market producers</i>	46	48			10%
<i>social assistance benefits in kind via market producers</i>	8	8			2%
<i>individual other non-market output</i>	35	36			8%



Table 6.6g Disposable income in cash and final consumption expenditure in cash (supplementary table)

	2007	2008	08-07	08/07
Disposable income of hh	382	401	19	5.0%
minus: Imputed services of owner-occ. dwellings	-29	-30	-1	3.4%
plus: Intermediate cons. of owner-occ. dwellings	6	6	0	0.0%
plus: Interest on mortgages	25	26	1	4.0%
minus: Other output for own final consumption	-1	-1	0	
minus: Compensation of employees in kind	-3	-3	0	0.0%
minus: Imputed insurance services	-19	-20	-1	5.3%
plus: 'Consumption taxes'	5	6	1	20.0%
is equal to				
Disposable income in cash of hh	366	385	19	5.2%
Final consumption expenditure of hh	362	384	22	6.1%
minus: Imputed services of owner-occ. dwellings	-29	-30	-1	3.4%
plus: Intermediate cons. of owner-occ. dwellings	6	6	0	0.0%
plus: Interest on mortgages	25	26	1	4.0%
minus: Other output for own final consumption	-1	-1	0	0.0%
minus: Compensation of employees in kind	-3	-3	0	0.0%
minus: Imputed insurance services	-19	-20	-1	5.3%
plus: 'Consumption taxes'	5	6	1	20.0%
is equal to				
Final consumption expenditure in cash	346	368	22	6.4%

Table 6.6h Revenue and expenditure of households (supplementary table)

	2007 abs.	2008 abs.	08-07 abs.	08/07 %ch.	2007 comp.
<b>A. REVENUE</b>					
Actual market output	167	176	9	5%	23%
Other subsidies on production	3	1	-2	-67%	0%
Compensation of employees in cash	351	369	18	5%	48%
Property incomes receiveable	40	44	4	10%	5%
interest	15	17	2	13%	2%
dividends	12	13	1	8%	2%
withdrawals from quasi-corporations	2	2	0	0%	0%
property income of life insurance policy holders	11	12	1	9%	1%
Current transfers receiveable	173	177	4	2%	24%
social security benefits in cash	72	69	-3	-4%	10%
pension benefits	33	35	2	6%	4%
other funded social insurance benefits	3	2	-1	-33%	0%
unfunded employee social benefits	16	20	4	25%	2%
social assistance benefits in cash	21	22	1	5%	3%
casualty insurance claims	17	19	2	12%	2%
other current transfers receiveable	11	10	-1	-9%	1%
Capital transfers receiveable	2	3	1	50%	0%
<b>TOTAL REVENUE</b>	<b>736</b>	<b>770</b>	<b>34</b>	<b>5%</b>	<b>100%</b>
P.M. Correction for pension fund reserves	35	37	2	6%	
<b>B. EXPENDITURE</b>					
Expenditure for production	149	154	5	3%	19%
compensation of employees	27	28	1	4%	3%
intermediate consumption (excl. interm. cons. on owner-occ. dwellings)	72	74	2	3%	9%
gross capital formation (excl. own-acc.)	46	48	2	4%	6%
acquisition of other non-financ. assets	2	2	0	0%	0%
other taxes on production	2	2	0	0%	0%
Final consumption expenditure in cash	346	368	22	6%	45%
'consumption taxes'	5	6	1	20%	1%
interm. cons. on owner-occ. dwellings	6	6	0	0%	1%
interest on mortgages	6	6	0	0%	1%
other	329	350	21	6%	43%
Property incomes payable	37	40	3	8%	5%
other interest payable (e.g. consumer credit, producers)	36	39	3	8%	5%
rent on land and sub-soil assets	1	1	0	0%	0%
Current transfers payable	235	243	8	3%	30%
social security contributions	114	118	4	4%	15%
actual pension contributions	21	23	2	10%	3%
other actual social insurance contributions	3	2	-1	-33%	0%
other current taxes on income, wealth, etc.	52	53	1	2%	7%
gross casualty insurance premiums	34	38	4	12%	4%
other current transfers payable	11	9	-2	-18%	1%
Capital transfers payable	7	7	0	0%	1%
capital taxes	2	2	0	0%	0%
other capital transfers	5	5	0	0%	1%
<b>TOTAL EXPENDITURE</b>	<b>774</b>	<b>812</b>	<b>38</b>	<b>5%</b>	<b>100%</b>
P.M. Consumption of fixed capital	22	23	1	5%	
Own-account capital formation	2	2	0	0%	
<b>C. Balancing items</b>					
Disposable income in cash	341	359	18	5%	
Saving	30	28	-2	-7%	
Net lending	-3	-5	-2	67%	

Table 6.6i Price, volume and key-ratios for households (supplementary table)

	2007	2008
Price-changes		
1 Output	1.8%	1.8%
2 Intermediate consumption	1.7%	0.8%
3 Consumption of fixed capital	1.8%	1.7%
4 Value added	2.4%	3.1%
5 Capital formation	1.8%	1.7%
6 Final consumption expenditure	2.0%	1.8%
7 Actual final consumption	2.0%	1.9%
8 Final consumption expenditure in cash	1.7%	1.3%
9 General price-change of goods and services	2.2%	0.7%
10 Nominal interest rate (long term)	5.2%	4.4%
11 Real interest rate (long term)	3.0%	3.7%
Volumes and purchasing power		
1 Output (% change)	1.7%	1.7%
2 Intermediate consumption (% change)	2.9%	4.6%
3 Consumption of fixed capital	2.4%	2.8%
4 Value added (% change)	2.2%	4.0%
5 Capital formation	7.8%	2.5%
6 Labour (% change)	1.3%	1.1%
7 Labour (abs. change)	0.03	0.03
8 Labour (level, millions)	2.44	2.47
9 Labour, employees (level, millions)	0.86	0.89
10 Labour productivity change	0.9%	2.9%
11 Number of households (millions)	6.67	6.76
12 Number of inhabitants (millions)	15.61	15.70
13 Final consumption expenditure	2.6%	4.1%
14 Actual final consumption	2.9%	4.0%
15 Final consumption expenditure in cash	2.8%	5.2%
16 Real disposable income	3.0%	3.2%
17 Real adjusted disposable income	3.3%	2.8%
18 Real disposable income in cash	3.2%	3.9%
19 Real change in net worth (billion euros)	241	329
due to real saving and capital transfers	49	50
due to real other changes in the volume	-9	-9
due to real holding gains on assets	191	285
due to real holding gains on liabilities to creditors	10	3
Keyratios		
1 Output per full-time eq.	81.4	84.6
2 Value added per full-time equivalent	40.5	42.9
3 Compensation of employees per employee	31.3	31.5
4 Final cons. in cash/Disp.income in cash	0.95	0.96
5 Final cons. expenditure/Disposable income	0.95	0.96
6 Actual final cons. /Adjusted disposable income	0.96	0.97
7 Actual final cons. per inhabitant	28.9	30.3
8 Adjusted disposable income per inhabitant	30.2	31.4
9 Net worth per inhabitant, beginning	200.3	219.0
10 Net worth per inhabitant, end	220.2	241.4
11 Change in net worth as % of Net worth	9.9%	10.2%
12 Real change in net worth as % of Net worth	7.7%	9.6%
13 Leverage ratio, beginning of year	13.1%	13.6%
14 Leverage ratio, end of year	13.6%	13.9%
15 Relative size in Domestic employment	20%	20%
16 Relative size in Domestic Product	16%	16%

### *Output*

Output by households includes all the production of goods and services in exchange for money (actual market output). Examples are the output of self-employed like shopkeepers, farmers, doctors, child-keepers and cleaning-ladies. This applies also to production from which the revenues are not declared in full to the fiscal authorities. It also covers production forbidden by law. Cases in point are prostitution and trade in drugs.

Furthermore, output by households includes also two types of production not exchanged for money:

- own-account capital formation, e.g. own-account construction by households;
- output for own final consumption, e.g. production of agricultural products for own final consumption or the services of owner-occupied dwellings.

In Polderland, output of households was 199 billion euros in 2007. More than 84% of this output pertained to actual market output. Own-account capital formation was responsible for 1%, while the 15% of the output was output for own-final consumption. The latter consisted mainly of services of owner-occupied dwellings.

Output by households excludes the following borderline cases:

- domestic and personal services produced and consumed within the same household<sup>81</sup>. Examples of such unpaid household services are cleaning, the preparation of meals, the education of children and the care of sick or elderly people;
- volunteer services that do not lead to the production of goods, e.g. care-taking, cleaning and do-it-yourself activities without payment;
- factor services, like the services of labour, financial assets and non-financial assets;
- the services of consumer durables owned by households;
- leisure time.

The concept of output by households is consistent with other national accounting concepts for households, like value added, employment, disposable income and final consumption expenditure of households. For example, unpaid household services are not regarded as output. Therefore they do not contribute to value added by households and Domestic Product, do not involve employment, do not increase household disposable income and are not part of the final consumption expenditure of households. In contrast, services of owner-occupied dwellings contribute to Domestic product, increase household disposable income and are included in final consumption expenditure of households.

### *Primary income*

The income of the self-employed can be regarded as a mixture of compensation of employees and operating surplus. Their income is therefore labelled as mixed income. The operating surplus of households is therefore limited to the operating surplus on the services of owner-occupied dwellings.

Mixed income can be split into the mixed income of officially registered self-employed and the income pertaining to paid informal activities, e.g. the mixed income of cleaning ladies and childminders (babysitters).

In Polderland, compensation of employees is less than one third of net value added. The operating surplus on owner-occupied dwellings accounts for one fifth, the income of officially registered self-employed amounts to over two-fifth, while the income on informal activities is about one tenth.

Primary incomes receivable by households consists of :

- operating surplus/mixed income;
- compensation of employees;
- property incomes receivable.

The property incomes receivable are interest on deposits, dividends on equity, withdrawals from quasi-corporations (roughly speaking: the dividend from quasi-corporations owned by households) and the property income attributed to insurance policy holders.

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<sup>81</sup> However, domestic and personal services produced by employing paid domestic staff are included.

The property incomes payable are interest (e.g. on mortgages or consumer credits and rents on land and subsoil assets).

In Polderland, the property incomes receivable by households are dominated by the property income of insurance policy holders: in 2007 they account for 67% of the total property income receivable (60 billion guilders of the 89 billion guilders). This is mainly due to the property income attributed to pension claim holders: this specific item is responsible for more than 50% of the total property income receivable.

Property income payable by households in Polderland consists mainly of interest, e.g. on mortgages and consumer credit.

### *Disposable income in cash*

The secondary distribution of income account describes the redistribution of income in cash. The balancing item is disposable income (in cash). No redistribution of income in kind receivable from government and non-profit institutions serving households is recorded in this account.

Two types of redistribution can be distinguished: redistribution due to insurance and other redistribution. Redistribution due to insurance consists of two types of insurance: social insurance and casualty insurance.

In the guidelines, social insurance contributions are split into:

- employers' actual social contributions;
- actual employees' social contributions;
- actual social contributions by self-employed and non-employed;
- and imputed (employers') social insurance contributions.

This classification explicitly shows the employers' social contributions (both actual and imputed). In this way, a clear link is established with wages and compensation of employees. Social insurance benefits are split into social security benefits (in cash and in kind), private funded social benefits and unfunded employee social benefits.

In our Polderland-tables, the social insurance contributions have been broken down into:

- social security contributions;
- contributions to funded pension schemes;
- contributions to other private social schemes;
- and imputed (employers') social insurance contributions.

In this way the breakdown of the social insurance contributions has a straightforward relationship with the breakdown of the corresponding benefits. Furthermore, the contributions and benefits of funded pension schemes have been shown separately. This is important considering the special case of pensions. The price to be paid for this alternative breakdown is that the employers' social contributions are not shown separately.

Casualty insurance can insure the same type of risks as social insurance. For example, both can ensure against medical expenditure or loss of income due to an accident. The difference is that social insurance pertains to contracts organised by the government or the employer. In the case of casualty insurance the contracts are taken out solely on the own initiative of the insured (see also paragraphs 4.86 and 4.87 in ESA95).

Private funded insurance schemes are regarded as market producers that sell their insurance services. Their premiums, like contributions for a funded pension scheme or casualty insurance premiums, are therefore recorded net of an implicit charge for insurance services sold. These premiums are limited to what will be redistributed among the insured. Social security schemes and unfunded schemes do not sell any insurance services. As a consequence, their premiums for social security schemes and unfunded schemes are recorded gross, i.e. no implicit charge for insurance services sold is recorded.

The guidelines regard life insurance fully as a way of saving. As a consequence, life insurance premiums and claims are not recorded as redistribution of income, but as financial transactions. The life insurance premiums are recorded net of the implicit life insurance services sold. The latter are recorded as final consumption expenditure by households.

Pensions are a special case as they are a mixture of redistribution of income and saving: the current pension benefits are not only financed by the current contributions but also by the

property income on earlier contributions. This is accounted for by imputing pension contributions by amount of the property income attributed to the pension claim holders<sup>82</sup>.

The actual and imputed pension contributions are intended to cover both current and future pension benefits. The difference between these pension contributions and the current benefits should therefore be regarded as savings for future pension benefits.

The saving by an increase in future pension claims can not directly be spent on final consumption expenditure. Disposable income should therefore preferably not include these savings. This has been achieved by not recording the change in future pension claims on the redistribution of income account, but by recording it as a separate resource on the use of income account.

Redistribution of income can also pertain to revenue and expenditure not related to insurance. A major example of such an income transfer received by households are social assistance benefits in cash, e.g. general subsistence benefits, scholarships and benefits for war victims. Other examples are payments of compensation, betting gains and transfers received from other households (e.g. gifts by parents). The major example of non-insurance income transfers paid by households is current taxes on income, wealth etc. paid by households, e.g. taxes on wages and income and taxes related to the rental of dwellings. Other examples are fines, penalties and transfers paid to other households.

In Polderland, the redistribution of household income in cash is substantial. The current transfers receivable (173 billion euros in 2007) are 35% of the balance of primary incomes, while the current transfers payable (288 billion euros in 2007) are 58%. As a consequence, disposable income of households is 23% lower than their balance of primary incomes.

The major part of the redistribution of income in cash pertains to insurance. Of the transfers receivable only the social assistance benefits in cash and the other current transfers do not pertain to insurance. They account for only 4% of the current transfers receivable. Of the transfers payable only the current taxes on income, wealth etc. and other current transfers do not pertain to insurance. They account for only 16% of the current transfers payable.

The imputed contributions for funded pension schemes are equal to the property income attributed to pension claim holders. In Polderland, these imputed contributions (47 billion euros in 2007) are more than twice as large as the actual contributions (21 billion euros).

### *Adjusted disposable income*

Adjusted disposable income is a more encompassing income-concept than disposable income, as it takes also account of the redistribution of income in kind by the government (see table 6.6d). Three types of redistribution of income in kind can be distinguished:

- social security benefits in kind via market producers;
- social assistance benefits in kind via market producers<sup>83</sup>;
- individual other non-market output.

Social security benefits in kind are provided under a social security scheme. This implies that social security contributions have been paid for these benefits. In contrast, social assistance benefits are generally financed via taxes. Examples of social assistance benefits in kind via market producers are rent allowances and a public transport card for students. Social security benefits in kind often relate to health care, e.g. the reimbursement of medical expenditure or the provision of health care to the insured.

A common characteristic of social security and social assistance benefits in kind via market producers is that the goods and services received by households have not been produced by the government. For example, private hospitals can produce the health care services distributed by government as social security or social assistance benefits in kind. In contrast, individual other non-market output is the redistribution of the own-production of the government. Cases in point can be education services, preventive health care, community services and housing for asylum-seekers.

<sup>82</sup> Even casualty insurance includes some imputed contributions by amount of the investment income generated by insurance companies on receiving contributions earlier than paying out claims.

<sup>83</sup> In some countries, social assistance benefits in kind may also include other non-market output produced by the government.

In Polderland, the income transfers in kind receivable by households were 89 billion euros (see table 6.6d), i.e. 18% of the balance of primary incomes of households. This implies that the total income transfers in cash and in kind receivable by households (including the change in future pension claims) were 297 billion euros in 2007. This is 9 billion euros more than the income transfers payable by households (288 billion euros). So, the redistribution of income had a small net positive result for the total of the sector households. However, most likely, within the sector households substantial redistribution of income has taken place, e.g. from the employed to the unemployed.

### *Final consumption*

The two concepts of disposable income are accompanied by two concepts of final consumption. Disposable income of households is the income that is used for final consumption expenditure. Adjusted disposable income is the income that is used for actual final consumption expenditure.

Final consumption expenditure includes the following borderline cases:

- services of owner-occupied dwellings;
- income in kind, like free travel for the employees of railways or airlines, free food for employees in agriculture or child-care provided free or at reduced rates to employees;
- items by convention not treated as intermediate consumption, like materials for small repair to dwellings, expenditure on food, shelter and healthcare and costs of transportation to and from work;
- items by convention not treated as capital formation, in particular consumer durables (e.g. refrigerators, television-sets and motor-vehicles) and expenditure on 'human capital' like school-fees or income foregone by studying instead of working;
- fees for financial services;
- insurance services by amount of the implicit service charge, i.e. not by amount of the insurance premium;
- pension funding services by amount of the implicit service charge;
- payments by households for government services, like driving or television licenses, school-fees, waste disposal fees and entrance fees for a museum;
- tourist expenditure abroad made by residents.

Household final consumption expenditure excludes amongst others:

- all those payments by households which are to be regarded as taxes, such as licenses on the use of vehicles;
- income transfers paid by households to non-profit institutions serving households, such as subscription and contributions for trade unions, churches and sport clubs and gifts to charities, relief and aid organisations;
- items treated as gross capital formation, like the purchase of a dwelling, major improvements to a dwelling (e.g. a drastic renovation of the kitchen or a new roof) and the purchase of valuables (e.g. antique, jewellery and paintings).
- items treated as the acquisition of non-produced assets, in particular the purchase of land.
- social security benefits in the form of reimbursements by social security funds of approved expenditures made by households; these are recorded as final consumption expenditure by the government.
- other social security benefits in kind via market producers, like the provision of medical treatments, hospital accommodation, medical equipment and special adjustments in the dwellings of handicapped; these are recorded as final consumption expenditure by the government.
- social assistance benefits in kind via market producers, like individual rent allowances, a public transport card for students and legal assistance for the poor. These are recorded as final consumption expenditure by the government.
- individual other non-market output by the government<sup>84</sup>, like education services, preventive health care and care for the elderly, mentally ill or addicted.

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<sup>84</sup> Or non-profit-institutions serving households.

- goods and services not produced or not accounted for as output, like clean air, polluted air, nice weather, leisure time, unpaid household services, volunteer services and freedom of speech;
- tourist expenditure on the domestic territory by non-residents; these are recorded as final consumption expenditure of countries to which these non-residents belong.
- business expenditure whether made on the domestic territory or abroad, e.g. expenditure on meals, hotels and entertainment incurred by business travellers in the course of their duties.

Actual final consumption of households is equal to final consumption expenditure plus the income transfers in kind received from the government and non-profit institutions serving households, i.e. plus the social security benefits in kind via market producers, the social assistance benefits in kind via market producers and the individual non-market output.

In Polderland, actual final consumption of households is about 25% higher than their final consumption expenditure.

#### *Final consumption by product and function*

For showing the composition of final consumption expenditure and actual final consumption, two classifications are recommended by the guidelines:

- a classification by product-group (see table 6.6e);
- a classification by function (COICOP) (see table 6.6f).

The product-classification shows which products are involved. It aims at a good description of the different production processes and their links with the supply and use of products (see also section 6.8).

Table 6.6e shows for Polderland the composition of final consumption expenditure of households by product. For example, 41% of these expenditure are on manufactured products. The table shows at the bottom also an alternative classification: non-durable goods, semi-durable goods, durable goods and services. This alternative classification can be derived from the much more detailed product-classification. However, it is also embedded in the more detailed versions of the functional classification.

The functional classification shows the different purposes of consumption. It aims at clarifying consumer behaviour as such. Different products can serve one function. For example, the function transport includes the purchase of vehicles and fuel (manufactured products), repair of vehicles and transport services. All these goods and services come from entirely different production processes, but serve the same purpose of consumption, i.e. transport. Another example is the function alcoholic beverages, tobacco, etc. This function groups addictive products, while excluding non-addictive products like non-alcoholic beverages. Separating out addictive products is highly relevant for understanding consumer behaviour. However, for understanding production processes it is irrelevant. Such a grouping is therefore absent in the product-classification.

Table 6.6f shows the composition of actual final consumption in Polderland by thirteen functions. The table shows also the roles played by final consumption expenditure and individual government consumption.

Individual government consumption expenditure can pertain only to five functions: housing, water and fuel (e.g. rent allowances), health (e.g. medical care reimbursed by the government), recreation and culture (e.g. the non-market part of services of a municipal theatre or museum), education (e.g. non-market education services by the government) and social protection (e.g. a pushchair for the handicapped). All the other functions consist of only final consumption expenditure.

In Polderland, individual government consumption expenditure is important for three functions: health, education and social protection. In terms of actual final consumption, it accounts for 67% of the function health, 94 % of education and 100% of social protection. The percentage for the other two functions is very low: 4% of housing, water and fuel and 7% of recreation and culture.



### *Accumulation account*

The capital account records the purchase and sale of produced and other non-financial assets, the consumption of fixed assets and capital transfers paid and received. The balancing item is net borrowing, i.e. the balance of all non-financial flows.

Capital formation is the purchase and sale of produced assets. Produced assets include valuables (e.g. jewellery, paintings and antique) and durables used for production purposes. However, durables for (final) consumption purposes are excluded. They are not regarded as assets. The purchase of these durable goods is recorded as final consumption expenditure. Their sale is recorded as negative final consumption expenditure. This implies that the purchase of computers, software, cars, refrigerators and furniture by self-employed is recorded as capital formation, while the purchase of these goods for consumption purposes is recorded as final consumption expenditure. The services of owner-occupied dwellings are regarded as output. The purchase of dwellings is therefore always recorded as capital formation.

In Polderland, expenditure on consumer durables are substantially larger than gross capital formation by households. For example, in 2007 expenditure on consumer durables was 79 billion euros, while gross capital formation amounted to 48 billion euros.

Examples of capital transfers receivable by households are investments grants to self-employed, investments grants for the purchase of dwellings, payments by the government to compensate for assets destroyed by acts of war or natural disasters, non-recurrent bonus payments on savings granted by the general government and inheritances.

Capital transfers payable to households include inheritances, inheritance taxes and taxes on holding gains.

The financial account records the transactions in financial assets and liabilities. An important financial asset of households are the technical reserves for life and pension insurance. In Polderland, the changes in these reserves (in 2007 53 billion euros) represent even more than 50% of the net acquisition of financial assets by households (in 2007 94 billion euros). Other financial assets owned by households are currency, deposits and shares. The liabilities of households consist fully of loans. These can be mortgages, consumer credit or loans for production purposes.

For households, the most important other changes in assets are in general:

- damage to non-financial assets due to natural disasters or acts of war or political violence;
- nominal holding gains on dwellings;
- nominal holding gains on insurance technical reserves;
- nominal holding gains on shares and other equity.

Substantial nominal holding gains occurred for households in 2007 and 2008. In 2007, nominal holding gains on non-financial assets, like dwellings, amounted to 120 billion euros. The nominal holdings gains on financial assets were 151 billion euros. These holding gains are very substantial, e.g. they amounted to more than two-third of disposable income of households.

Holding gains can be an important source of finance for households. For example, gains on buying and selling financial assets can be used to buy a new car or to redecorate the house. Similarly, holding gains on dwellings increases the solvability of households and can thus be used for extra loans (e.g. a higher mortgage) and additional expenditure.

### *Supplementary tables*

Standard national accounting concepts of household income and expenditure are not optimal for all types of analysis. Table 6.6g shows an alternative set of concepts: *disposable income in cash and final consumption expenditure in cash*. They are broadly similar to disposable income and final consumption expenditure. However, the in cash concepts do not include imputations, like those for the services of owner-occupied dwellings and insurance services. Furthermore, consumption taxes and interest on mortgages are included in final consumption expenditure. Examples of consumption taxes are car registration taxes and real estate tax. The cash concepts are more micro-oriented concepts, are closer to the expenditure and prices as

perceived by households and therefore better for analysing the actual behaviour of households.

The in cash concepts of disposable income and final consumption expenditure can be embedded in micro-oriented concepts of revenue and expenditure by households. This is done in table 6.6h. The building-bricks of revenue and expenditure are the standard national accounting concepts. However, they do not contain any double-counting, as balancing items and other specific bookkeeping entries included in resources and uses have been left out. This applies in particular to imputed services of owner-occupied dwellings, imputed employers' social contributions and imputed pension contributions by amount of the property income attributed to pension holders. Two important standard balancing items, i.e. saving and net lending, can be derived easily. Disposable income in cash is presented as the balancing item of the current revenue and expenditure other than final consumption expenditure in cash.

Prices, volumes and key-ratios are presented in table 6.6i. The table does not contain any international comparison of the level of some variable. As a consequence, purchasing power parities are also absent in the table.

### 6.6.2 Discussion

This section discusses the relevance of the national accounts description of households. This relevance will be investigated in four ways. First, the merits of the sub-sectoring will be discussed. Secondly, a comparison is made with the concepts of income used for tax purposes. Thirdly, a comparison is made with economic theoretic concepts. Fourthly, the merits and limitations of recording unpaid household services as output are evaluated by looking at the consequences for the various data uses and by a comparison with types imputed output included in the standard national accounts.

#### *The breakdown of the sector*

The guidelines recommend to distinguish six subsectors by type of income, e.g. a sub-sector households where employee income is most important and a sub-sector where social benefits are the most important source of income. This sub-sectoring is not without problems analytically and statistically.

There are two inherent analytical problems. First, the classification of households by one major source of income can be problematic and misleading when many households exist for which several sources of income are substantial. A solution doing justice to this fuzzy reality is to create one or more extra subsectors for such households. Secondly, the major source of income of a household may drastically change in some years. This can have two causes: a change in major source of income of individual persons (e.g. becoming unemployed or retiring) or a change in the composition of the household (e.g. due to death, children leaving their parents or divorce). Without being able to distinguish the two causes for change, the figures on the various subsectors are not very meaningful. A possible solution is to create extra subsectors in order to show these dynamics in the composition of each sub-sector. The need to create many extra subsectors for a meaningful analysis reveals in fact that the standard classification is just too simple to do justice to the complex reality of households.

The statistical problems involved are also substantial. Applying the sub-sectoring for the whole set of accounts requires in fact a very elaborate and very frequent set of micro data on individual persons, individual households, their links and their revenue, expenditure, assets and liabilities (e.g. what are final consumption expenditure and financial assets of a household whose major source of income are pensions?). In the absence of such data national accounts figures will to a great extent reflect the assumptions made during the compilation process.

The value added of sub-sectoring of households by type of household is not very big. Most purposes are better served by drawing up a micro-data base on individual persons and households and linking this data base at a very aggregate level to the national accounts figures on the sector households. Such a micro-data base allows also to target the grouping of

households at the object of analysis, e.g. the analysis of households in year  $x + 5$  living in year  $x$  from unemployment benefits.

A more promising approach for standard breakdowns at the aggregate level is to focus on the characteristics of individual persons and apply them only where they are the most meaningful and also statistically feasible. For example, compensation of employees received by the sector households can be broken down by industry of employment, age, sex or level of education using a labour force survey. However, by applying all these classifications simultaneously the data requirements for a statistically robust result become also very big.

### *Income for tax purposes*

Households generally only have to report about their revenue, expenditure and wealth to the tax authorities or to social insurance bodies. The concepts of income and wealth for tax purposes have in most countries a lot in common with the standard national accounts concepts of income and net wealth. They are also *ex post* concepts generally levied on revenue, expenditure and wealth that is directly observable in monetary terms. Even a major exception in the national accounts, i.e. the imputation of the services of owner-occupied dwellings, is also often applied in calculating income for tax purposes. Similarly, wages for tax purposes often also include various wages in kind. However, there are also important differences with the concepts in tax forms.

A first important difference is that the concepts used in the standard national accounts are much more standardised over time and internationally. In fact, comparison over time is no major purpose of the reporting to the tax authorities. The major purpose is the proper assessment of the amount of taxes to be paid. Comparison over time only serves to check the plausibility of the data. Furthermore, concepts for tax purposes are often regularly changed. International comparison is generally also not a purpose for defining the national tax concepts.

A second important difference is the national accounts apply double-entry bookkeeping and distinguish much more accounts and balancing items. Furthermore, they include also balance sheets and a link to prices and volumes.

A third difference is that the concepts in the national accounts differ substantially with respect to delimitation and valuation.

Taxable income does not correspond to one of the national accounts concepts of income. It is best regarded as a mixture of primary income and disposable income with some major deviations. Taxable income generally does not include all primary income received, as property income attributed to insurance policy holders will usually not be taxed. Furthermore, travel costs for going to and from work and the costs for child-care are generally regarded as deductions for calculating taxable income. However, in the national accounts these expenditure are irrelevant for primary income as they are recorded as final consumption expenditure.

Taxable income can include also some income transfers received, e.g. the gains from winning a lottery or pensions may be subject to income tax. However, not all income transfers will in general be covered, e.g. social assistance benefits in cash and casualty insurance claims received are usually not subject to income tax. Income transfers paid may also be used as a deduction in calculating taxable income. Examples are pension contributions, insurance premiums for health care and gifts for social purposes. However, not all income transfers will be used as a deduction, as income tax itself is one of these transfers. In calculating taxable income even financial transactions may be deducted, e.g. a life insurance to supplement your future pension benefits, or realised holding gains be added.

The valuation of income in kind can also substantially differ. This applies e.g. to the imputed services of owner-occupied dwellings and to the private use of a business car.

### *Economic theory*

A famous definition of income is by Hicks: "income is what you can spend in one period and be as well off at the end as at the beginning" (Hicks, 1946, p. 172). Hicksian income amounts to discounting (expected) future income and consumption and can be interpreted as the "maximum level of permanently maintainable consumption" (see also Weitzman, 1976). It

has only a pertinent meaning in a metaphysical world without uncertainty and changes in prices, interest rates and wants. The standard national accounts concepts of income are fundamentally different, as they do not discount future income but are derived from revenue and expenditure in the current period. Furthermore, the standard national accounts concepts of income are much more specific, as they are explicit about how to measure their concepts, e.g. they exclude income from unpaid household services but include income from owner-occupied dwellings.

Welfare is the ultimate yardstick of economic analysis. However, income and net wealth in the national accounts do not measure welfare for many reasons, e.g. unpaid household services, leisure time, amenities and dis-amenities of urban life and the inequalities in the distribution of income over persons are not taken account of. Furthermore, welfare has many dimensions, most of which are best not expressed in monetary terms. A better solution for measuring welfare is therefore to use, for each dimension, separate indicators and units of measurement. The indicators could be, for example, infant mortality, life expectancy, adult literacy and national income per capita.

In the standard national accounts compensation of employees is not regarded as a payment for a service but as a payment for a factor service. However, from the point of view of human capital theory compensation of employees is better regarded as a payment for a service. The employee can improve the quality of this service by improving the human capital, e.g. by following education and training. Net operating surplus of the employee would then be equal to compensation of employees minus capital consumption on human capital and minus various other costs. The direct consequence of treating compensation of employees as a payment for a service is that the value added of the sector households would increase by amount of the compensation of employees, while the value added of the other sectors would decrease by the same amount.

Consumer durables, like cars, televisions, personal computers and refrigerators bought for consumption purposes, are recorded as final consumption expenditure in the national accounts. However, when bought for production purposes, they are recorded as capital formation. This implies that the delimitation of fixed assets depends on the purpose of use. An alternative treatment is to record also the purchase of these durable goods for consumption purposes as capital formation. The logic of the accounting system requires then that:

- capital stock and consumption of fixed capital should be recorded for these consumer durables;
- a value for the services of the consumer durables should be imputed as output;
- an operating surplus on this output is added to the primary and disposable income of households;
- the imputed services of consumer durables are used up as part of final consumption expenditure.

Such a treatment is already applied for the services of owner-occupied dwellings.

Recording the purchase of consumer durables as capital formation has clear merits:

- a more consistent concept of capital formation;
- a more meaningful standard balance sheet better reflecting the net worth and solvability of households;
- a concept of final consumption expenditure of households that treats buying a consumer durable similar to renting one; this is more meaningful when comparing the final consumption expenditure of different groups of households.
- concepts of disposable income and final consumption expenditure of households that are more comparable over time and internationally (from a welfare point of view).

Two objections are commonly raised against this alternative treatment: there are practical problems in determining the value to be imputed and relevance is lost by introducing extra imputations. However, both objections can be overcome.

The practical problems are the same as for the services of owner-occupied dwellings. In principle, the market price of the services of consumer durables should be imputed, i.e. the rental price. When there is actually no market for the renting of consumer durables, the

imputed value could be set at the production costs, i.e. the sum of capital consumption plus an opportunity cost for the money invested.

By introducing such extra imputations relevance is not lost. Actually, a lot of relevance is gained. Furthermore, by presenting a supplementary table with cash concepts, the drawbacks of introducing extra imputations can be taken away.

*The relative merits of including unpaid household services*

The standard national accounts includes several types of imputed output, e.g. the other non-market output by the government, indirectly financed banking output, own-account agricultural output and services of owner-occupied dwellings. However, unpaid household services are not recorded as output. Does this reflect a specific (male) bias in the standard national accounts or can this be defended in a sound way?

In contrast to unpaid household services, government output should be included for completing the accounting system. Although government output is not explicitly sold, it has a definite (minimum) set of costs of production which are (mostly) explicitly paid for in monetary terms, like salaries paid to civil servants. Without recording government output a major rationale for the payment of taxes is ignored, government expenditure on goods and services can not be recorded as inputs for production and government employees can not be recorded as being employed. So, recording government output is required for a meaningful accounting of many flows actually exchanged for in monetary terms (and their corresponding volumes).

A similar argument applies to including financial intermediation services indirectly measured as output. These services are not sold as such, but nevertheless the production costs involved (compensation of employees, intermediate consumption, operating surplus, etc.) are paid for in monetary terms. In order to give the latter payments meaning, the corresponding output should also be recorded.

This argument does not apply to own-account agricultural output and services of owner-occupied dwellings. Not including own-account agricultural output would mean that purchases for producing this output, like seeds and machines, have to be recorded as final consumption expenditure. Furthermore, it is likely that these expenditure are usually limited in size, as they have to be financed by income or assets in monetary terms. Not recording services of owner-occupied dwellings as output would mean that the purchase of such a dwelling is final consumption expenditure and a mortgage is a way of financing this type of expenditure. Only when the dwelling is bought for letting it, it should be regarded as capital formation.

So, for completing the accounting system, own-account agricultural output and services of owner-occupied dwellings need not be recorded as output. In this respect, own-account agricultural output and services of owner-occupied dwellings are similar to unpaid household services. What then are the reasons to include the former items as output and to ignore the latter?

Unpaid household services are important for assessing and analysing welfare. However, welfare-oriented concepts of income and final consumption play only a very small role in economic policy and analysis. For most types of economic policy and analysis, concepts of output, income and final consumption are used that are much less encompassing but do cover (all) agricultural output and services of owner-occupied dwellings. This applies to the concepts used in levying taxes and social premiums and in providing social assistance. It applies also to the concepts commonly used in analyses of economic growth, income distribution and expenditure by type of household.

For example, a farmer often pays taxes on the basis of the total agricultural output. Similarly, taxable income of persons frequently contains an imputation for the services of owner-occupied dwellings. However, for such tax purposes, unpaid household services are usually not included. Furthermore, for employment and social security policy, a job is a paid job, employment is paid employment and unemployment benefits may even be granted to persons mainly engaged in unpaid household services (in the absence of paid work).

The national accounts convention to ignore unpaid household services thus reflects the concepts actually used in many policy areas, e.g. in taxation, employment and social security. By staying relatively close to these administrative concepts, the national accounts ensure the relevance and acceptance of its data for economic and social policy.

From the point of view of economic analysis, the concepts used in economic policy may not always be appropriate or perfect. In some cases, it could be argued that more extended concepts of income and final consumption should be used.

For example, for fairness sake, it would often make sense to extend the concept of taxable income. Take two persons earning the same amount of compensation of employees but one working full-time and the other half-time. They usually pay the same amount of taxes and social premiums, but differ substantially in time that can be spent on unpaid household services and leisure time. Furthermore, the person working full-time is likely to spend some of the money earned on buying household services, e.g. cleaning services or going to a restaurant. A similar unfair situation may apply to the granting of social assistance to persons or households earning less than a certain amount of money per month. The situation is in particular unfair if social assistance is partly provided in the form of household services, e.g. as child-care. Then, a small increase in money income may result in a drastic decrease in welfare. So, in such instances it would be fairer to use an extended concept of income: persons and households with less unpaid household services and leisure time should pay less taxes and social premiums and be more liable to receiving social assistance in the form of household services.

However, taxes and their concept of taxable income should not only be judged on the basis of such a concept of fairness. Many other criteria are important for assessing the welfare effects of a tax, like tax incidence, excess burden, efficient tax design and taxation effects on work effort, saving and investment. In addition, there are moral issues, like the philosophy of Christian political parties that taxation should stimulate families with children and partly finance that the mother is not having paid work. As a consequence, there are usually other grounds why administrative concepts of income and final consumption are not welfare-oriented concepts and ignore unpaid household services and leisure time.

Welfare is the ultimate yardstick of economic analysis. From this point view, it seems that unpaid household services should be included in the national accounts. However, in many types of economic analysis, unpaid household services are totally ignored. This applies not only to the analysis of economic growth but also to the analysis of income distribution and expenditure by type of household. Their purpose is usually not to explain a welfare-oriented concept of income and final consumption, but to explain the growth of income and expenditure in monetary or real terms. Unpaid household services may help in explaining these variables but they are not part of what is to be explained.

Furthermore, in many other types of economic analysis, the purpose is not to theorise about welfare but to assess the effects of a specific type of policy measure. Their purpose is to reveal what the effects are, whether the effects are big or small, on which circumstances and assumptions they depend and what the net effect is on welfare. For this purpose, it is not necessary to have a clearly defined and measured concept of welfare. In fact, such a concept may even hinder these analyses by not covering all relevant items (e.g. income distribution or external effects of pollution) or by measuring them imperfectly (e.g. by using current exchange values).

Unpaid household services can also themselves be the subject of economic analysis. Inclusion of values for unpaid household services in the national accounts can reveal the big economic importance of the subject.

However, the inclusion can not do much more. These values are only rough approximations of the economic importance of unpaid household services and leisure time and their relationship with the rest of the economy (e.g. with paid labour). They depend to a great extent on the assumptions made in calculating the values. As a consequence, they are not well suited themselves as an object of further economic analysis.

This reasoning applies also to own-account agricultural output and the services of owner-occupied dwelling. Their inclusion indicates their economic importance in monetary

terms, but it is not of any further use for economic analysis. For example, for economic analysis the real price of the services of owner-occupied dwellings is much more interesting than imputed 'market rent' of these services. The real price takes account of the costs of maintenance, the costs of financing and the reductions in the taxes to be paid.

For economic analysis, the value added of including estimates of the value of unpaid household services and leisure time is therefore limited to showing roughly their economic importance vis-à-vis the rest of the economy. So, although the huge economic importance of unpaid household services and leisure time suggests that their inclusion in the national accounts would be of great use for economic analysis, their value added for economic analysis is in fact very limited.

A major difference between unpaid household services on the one hand and own-account agricultural output and services of owner-occupied dwellings on the other is their relative size. As a consequence of their big economic importance, the inclusion of unpaid household services as output would drastically change the nature of the national accounts and its major aggregates. Domestic Product would become very sensitive to the assumptions made in calculating the values of unpaid household services. This would undermine the credibility of the national accounts as a statistic. Furthermore, the sheer size of the imputations would create an enormous gap between the national accounts concepts and administrative concepts. This will drastically limit its usefulness for economic and social policy and may therefore endanger its financing from collective funds. Finally, due to the arbitrary nature of these imputed estimates in combination with their sheer size, the focus of the national accounts would shift to providing some aggregates instead of providing a balanced description of the various processes and parts of the economy and their interactions. The national accounts would change from a multi-purpose description to a single purpose description not relevant for many practical policy-issues.

### 6.6.3 Summary

The standard national accounts describe households in terms of a coherent set of accounts in current prices, with two alternative concepts of consumption and disposable income, with some explicit links to prices, volumes and real values and with a table classifying final consumption by function.

The concepts of income for tax purposes in most countries have much in common with the standard national accounts concept of income, e.g. they focus on revenue and expenditure directly observable in money and generally also include an imputed income for the services of owner-occupied dwellings. Nevertheless, there are also three important differences:

- The national accounts are much more standardised over time and internationally.
- The national accounts distinguish much more accounts and balancing items, include also balance sheets and a link to prices and volumes.
- The concepts in the national accounts differ substantially with respect to delimitation and valuation. Income for tax purposes can best be regarded as a mix of primary income and disposable income with some major deviations.

The comparison with economic theoretic concepts indicates that income in the standard national accounts is fundamentally different from Hicksian income, does not measure welfare and does not record consumer durables as capital formation.

The national accounts description of households is not a direct reflection of what can be readily observed. It transforms what can be readily observed into a well-structured model. This includes a substantial amount of double-counting (e.g. property income attributed to insurance policy holders) and imputation (e.g. the imputed services of owner-occupied dwellings).

The Polderland-tables illustrate how the standard national accounts can be made more comprehensible and more relevant, e.g. by explicitly showing the various imputations, by adding various key-ratios, by drawing up a table on revenue and expenditure of households

and by introducing the concepts of disposable income in cash and final consumption expenditure in cash.

In the next generation of guidelines, the purchase of consumer durables should be regarded as capital formation and final consumption expenditure by households should include the imputed services of these consumer durables.



## 6.7 The Rest of the World

### 6.7.1 Description

#### *The roles of the Rest of the World*

The sector Rest of the World describes the roles played by non-residents in the national economy. These roles can be very diverse as the non-residents can be non-resident corporations, but also non-resident government or non-resident households.

The Polderland-statistics can be used to illustrate these roles. Imports are over 20% of total supply of goods and services and 65% of Domestic Product. Exports are close to 25% of total use of goods and services and more than 70% of Domestic Product. Primary income received from abroad is 13% of National Income and primary income paid to the Rest of the World is 12% of National income. Transfers to the rest of the world are about 2% of National Income, while transfers received from abroad are about 1% of National Income. Financial assets and liabilities with the rest of the world are nearly three times as big as National Income.

#### *Delimitation of the Rest of the World*

The sector Rest of the World describes the flows and stocks between the Rest of the World and the national economy. The delimitation of the Rest of the World is the mirror-image of the delimitation of the national economy: those enterprises, institutions and persons not belonging to the national economy are by definition part of the Rest of the World.

The national economy includes all units that have a centre of economic interest in the economic territory of that country. These units are the resident units.

The economic territory of a country consists mainly of the geographic territory administered by a government within which persons, products and financial capital circulate freely. However, it includes also the following borderline cases:

- The airspace, territorial waters and continental shelf lying in international waters over which the country enjoys exclusive rights;
- Territorial enclaves in the rest of the world, like embassies, consulates, military bases and scientific stations;
- Free zones, like bonded warehouses or factories under customs control.

Common features of an economic territory are the presence of one monetary and fiscal regime and the absence of custom-duties, immigration controls and financial flow-restrictions. However, not all of these features need to apply. This is the case, for example, for the free zones mentioned above. Furthermore, goods or persons travelling between a country and its territorial enclave abroad may be subject to controls by the government of the country in which the territorial enclave is located.

A centre of economic interest is a location from which a unit engages in production, consumption or other economic activities over a long period of time, generally more than one year. Examples of such locations are a dwelling, a shop, a farm or a factory.

Multinationals have producer units, i.e. centres of interest, in several countries. The national economy includes only those producer units active on its economic territory. Producer units of the multinational operating in the economic territories of other countries are regarded as units belonging to the Rest of the World.

#### *Current external account*

- Table 6.7a shows the current external account of Polderland. However, in order to meet the general bookkeeping requirements of the sector accounts (see section 6.2), this account is

Table 6.7a Current account of the Rest of the World (external flows)

	2007	2008	08-07	08/07
I. External account of goods and services				
R Imports	405	430	25	6.2%
U Exports	449	473	24	5.3%
External balance of goods and services	-44	-43	1	-2.3%
II. Primary income and current transfers				
R External balance of goods and services	-44	-43	1	-2.3%
Compensation of employees	1	2	1	100.0%
Taxes on production and imports	8	8	0	0.0%
Property incomes receiveable	62	72	10	16.1%
interest	45	47	2	4.4%
dividends	13	19	6	46.2%
reinvested earnings on direct foreign investment	4	6	2	50.0%
Current transfers receiveable	14	14	0	0.0%
social security benefits in cash	1	1	0	0.0%
pension benefits	1	1	0	0.0%
development aid	3	3	0	0.0%
contributions to international organizations	3	4	1	33.3%
net casualty insurance premiums	2	2	0	0.0%
other	6	5	-1	-16.7%
U Compensation of employees	1	1	0	0.0%
Subsidies	4	3	-1	-25.0%
Property incomes payable	80	86	6	7.5%
interest	44	48	4	9.1%
dividends	22	23	1	4.5%
reinvested earnings on direct foreign investment	14	15	1	7.1%
Current transfers payable	7	8	1	14.3%
casualty insurance claims	2	2	0	0.0%
current taxes on income and wealth	2	2	0	0.0%
other	3	4	1	33.3%
Current external balance	-51	-45	6	-11.8%

Table 6.7b Accumulation account of the Rest of the World

		2007	2008	08-07	08/07
	III.1. Capital account				
A (=U)	Capital transfers payable	2	2	0	0.0%
L (=R)	Current external balance	-51	-45	6	-11.8%
	Capital transfers receivable	5	5	0	0.0%
	Net borrowing	48	42	-6	-12.5%
	III.2 Financial account				
A	Net acquisition of financial assets	165	246	81	49.1%
L	Net incurrence of liabilities	213	288	75	35.2%
	Net lending	-48	-42	6	-12.5%
	III.3 Other changes in assets account				
A	Other changes in financial assets	154	170	16	10.4%
	volume changes	-1	-1	0	0.0%
	nominal holding gains	155	171	16	10.3%
	neutral holding gains	25	10	-15	-60.0%
	real holding gains	130	161	31	23.8%
L	Other changes in liabilities	63	63	0	0.0%
	volume changes	1	2	1	100.0%
	nominal holding losses	62	61	-1	-1.6%
	neutral holding losses	26	10	-16	-61.5%
	real holding losses	36	51	15	41.7%
	Net other changes in assets	91	107	16	17.6%

Table 6.7c Balance sheet of the Rest of the World with the national economy

	2007	2008	08-07	08/07
IV.1 Opening balance sheet				
A Financial assets	1114	1433	319	28.6%
shares and other equity	472	610	138	29.2%
other	642	823	181	28.2%
L Liabilities	1177	1453	276	23.4%
shares and other equity	456	545	89	19.5%
other	721	908	187	25.9%
Net worth	-63	-20	43	-68.3%
IV.2 Changes in balance sheet				
A Changes in financial assets	319	416	97	30.4%
shares and other equity	138	175	37	26.8%
other	181	241	60	33.1%
L Changes in liabilities	276	351	75	27.2%
shares and other equity	89	104	15	16.9%
other	187	247	60	32.1%
Changes in net worth	43	65	22	51.2%
due to balance of exports less imports	-44	-43	1	-2.3%
due to primary income	-14	-8	6	-42.9%
due to current & capital transfers	10	9	-1	-10.0%
due to other changes in the volume	-2	-3	-1	50.0%
due to nominal holding gains	93	110	17	18.3%
IV.3 Closing balance sheet				
A Financial assets	1433	1849	416	29.0%
shares and other equity	610	785	175	28.7%
other	823	1064	241	29.3%
L Liabilities	1453	1804	351	24.2%
shares and other equity	545	649	104	19.1%
other	908	1155	247	27.2%
Net worth	-20	45	65	-325.0%

Table 6.7d Imports by product

	2007	2008	07/06 volume	08/07 volume	2008 comp.
1 Products of agriculture, forestry and fishing	20	20	4.4%	-1.1%	5%
2 Products from mining and quarrying	22	17	-15.5%	-18.9%	4%
3 Manufactured products	314	339	8.6%	7.8%	79%
food, beverages & tobacco	26	27	2.1%	1.6%	6%
textile, clothing, leather, wood, paper	32	39	8.2%	6.3%	9%
fuel	8	6	8.1%	9.5%	1%
chemical and non-metallic products	56	59	10.2%	10.4%	14%
machinery and equipment	101	114	11.1%	9.4%	27%
vehicles	30	35	9.4%	8.8%	8%
other	61	59	5.0%	5.2%	14%
4 Electrical energy, gas, steam and hot water	0	0	2.3%	1.8%	0%
5 Construction	1	1	5.5%	-3.4%	0%
6 Repair	0	0	5.3%	5.1%	0%
7 Hotel and restaurant services	15	16	3.5%	7.2%	4%
8 Transport and communication services	6	7	9.2%	1.8%	2%
9 Financial intermediation services	2	2	-3.8%	-0.2%	0%
10 Real estate, renting and business services	25	28	12.1%	6.8%	7%
11 Public, social and personal services	1	1	4.6%	2.1%	0%
cif/fob-correction (ESA95, para 9.30)	-1	-1			0%
12 Total imports	405	430	9.0%	7.7%	100%
for intermediate consumption	200	205	5.9%	4.3%	48%
for final consumption exp. by hh	55	60	4.5%	8.6%	14%
domestic territory	40	44	4.1%	9.1%	10%
abroad	15	16	6.2%	7.1%	4%
for final consumption exp. by the gov.	1	2	2.1%	3.5%	0%
for capital formation	32	36	12.0%	13.0%	8%
for exports	117	127	15.3%	11.0%	30%
P.M. import duties	3	3			1%

Table 6.7e Exports by product

	2007	2008	07/06 volume	08/07 volume	2008 comp.
1 Products of agriculture, forestry and fishing	25	26	-4.5%	2.7%	5%
2 Products from mining and quarrying	10	9	-12.2%	-7.8%	2%
3 Manufactured products	339	360	7.7%	4.5%	76%
food, beverages & tobacco	59	59	3.0%	2.4%	12%
textile, clothing, leather, wood, paper	27	27	4.5%	1.1%	6%
fuel	18	14	0.5%	2.3%	3%
chemical and non-metallic products	77	79	8.7%	3.8%	17%
machinery and equipment	97	103	14.2%	6.8%	22%
vehicles	21	23	11.9%	12.3%	5%
other	40	55	0.8%	2.4%	12%
4 Electrical energy, gas, steam and hot water	0	0	10.2%	-5.0%	0%
5 Construction	2	2	15.2%	-2.3%	0%
6 Repair	0	0	0	0	0%
7 Hotel and restaurant services	10	11	8.5%	6.3%	2%
8 Transport and communication services	29	31	7.1%	0.5%	7%
9 Financial intermediation services	1	1	3.1%	-2.0%	0%
10 Real estate, renting and business services	32	32	8.7%	6.1%	7%
11 Public, social and personal services	2	2	2.1%	1.6%	0%
cif/fob-correction (ESA95, para 9.30)	-1	-1			0%
12 Total exports	449	473	9.0%	6.4%	100%
from domestic production	318	329	7.7%	4.5%	70%
from imports	130	143	15.3%	11.2%	30%
second-hand assets	1	1			0%
P.M. export subsidies	2	3			1%

Table 6.7f Exports minus imports by product

	2007	2008
1 Products of agriculture, forestry and fishing	5	6
2 Products from mining and quarrying	-12	-8
3 Manufactured products	25	21
food, beverages & tobacco	33	32
textile, clothing, leather, wood, paper	-5	-12
fuel	10	8
chemical and non-metallic products	21	20
machinery and equipment	-4	-11
vehicles	-9	-12
other	-21	-4
4 Electrical energy, gas, steam and hot water	0	0
5 Construction	1	1
6 Repair	0	0
7 Hotel and restaurant services	-5	-5
8 Transport and communication services	23	24
9 Financial intermediation services	-1	-1
10 Real estate, renting and business services	7	4
11 Public, social and personal services	1	1
cif/fob-correction (ESA95, para 9.30)	0	0
12 Total exports minus imports	44	43

Table 6.7g Prices, volumes and key-ratios with the Rest of the World (supplementary table)

	2007	2008
Price-changes		
1 Imports	2.6%	-1.5%
2 Exports	2.6%	-1.2%
3 Exchange-rate dollar	15.7%	1.7%
4 Purchasing power parity	-0.5%	1.0%
5 General price-change of goods and services	2.2%	0.7%
6 Nominal interest rate (long term)	5.2%	4.4%
7 Real interest rate (long term)	3.0%	3.7%
Volumes and purchasing power		
1 Imports	9.0%	7.7%
2 Exports	9.0%	6.4%
3 Real change in net worth	45	65
real balance of exports less imports	-43	-43
trading gains from changes in terms of trade	0.2	0.5
real primary income with the ROW	-14	-8
real current transfers with the ROW	7	6
real capital transfers with the ROW	3	3
real other changes in volume with the ROW	-2	-3
real holding gains with the ROW	94	110
Keyratios		
1 Imports as % of total resources of ROW	81.8%	81.0%
2 Property income as % of total resources of ROW	12.5%	13.6%
3 Other resources as % of total resources	5.7%	5.5%
4 Holding gains on financ. assets as % resources	31.3%	32.2%
5 Exports as % of total uses of ROW	82.7%	82.5%
6 Property income as % of total uses of ROW	14.7%	15.0%
7 Other uses as % of total uses ROW	2.6%	2.4%
8 Holding losses on liabilities as % of uses ROW	11.4%	10.6%
9 Imports as % of total supply of goods & serv.	22.8%	23.1%
10 Exports as % of total use of goods & serv.	24.3%	24.4%
11 Imports as % of NDP	64.8%	65.1%
12 Exports as % of NDP	71.8%	71.6%
13 Primary income received by ROW as % NI	11.1%	12.3%
14 Primary income paid by ROW as % NI	13.1%	13.3%
15 Income and capital transfers received by ROW %NI	3.0%	2.8%
16 Income and capital transfers paid by ROW %NI	1.4%	1.5%
17 Liabilities to ROW as % of National Income (end of year)	224.3%	276.4%
18 Financial assets at the ROW as %NI (end of year)	227.4%	269.7%



shown from the point of view of the Rest of the World. This implies that imports by the national economy are recorded as a resource, as they are a source of revenue for the Rest of the World.

The current external account of Polderland is dominated by imports and exports. For example, imports by the national economy amount to over 80% of the current resources of the Rest of the World. Examples of the other current resources are:

- compensation of employees paid to cross-border workers living abroad;
- interest on government bonds owned by non-residents;
- dividends on equity owned by non-residents;
- reinvested earnings on direct investments by non-residents;
- social security benefits and pension benefits to former residents now living abroad;
- aid to developing countries;
- dividend or income tax paid by residents to the tax authorities of other countries;
- contributions to international organisations;
- net casualty insurance premiums paid to non-resident insurance companies.

Similar examples apply to the current uses of the Rest of the World.

The definition of *imports and exports* is consistent with that of the national economy. Imports includes therefore the sales to residents by foreign affiliates of national corporations. This applies even to intra-company flows. For example, sales by the foreign affiliate of a national corporation to a domestic affiliate is recorded as imports by the national accounts. However, imports excludes the sales to residents by foreign controlled corporations on the economic territory. Imports excludes also fish caught by residents in international waters. Furthermore, imports excludes the purchases of embassies in their homeland, but includes the purchases of embassies in the country where they are located.

Imports and exports of goods mainly reflect changes of ownership between a resident and a non-resident. However, this does not apply for deliveries between affiliated enterprises. It also does not apply to financial leasing (e.g. of machinery, a ship or an aeroplane) and goods for significant processing to order (e.g. oil to be processed into petrol) or repair (e.g. of a ship). In these three instances a sale is recorded and balance sheets of the parties involved are adjusted as if a change of ownership had occurred.

Imports and exports of goods includes transactions between residents and non-residents in:

- non-monetary gold, i.e. gold not used (anymore) for the purposes of monetary policy;
- diamonds and other precious metals and stones;
- electricity, gas and water;
- livestock driven across frontiers;
- smuggled goods and other unrecorded shipments, such as gifts and those of less than a stated minimum value.

Imports and exports of goods are to be valued free on board at the border of the exporting country (fob). This value consists of:

- the value of the goods at basic prices;
- plus the related transport and distributive services up to that point of the border;
- plus any taxes on the goods exported;
- minus any subsidies on the goods exported.

The fob-value can deviate from the invoiced value. This occurs e.g. when the latter includes also transport up to the factory of the importer. The fob-value can be regarded as the market price at the border of the exporting country.

The total imports are to be valued at fob-value. However, imports of goods by product group are to be valued at the costs-insurance-freight (cif) price at the border of the importing country. This price excludes the payment of any import duties and excludes all the trade and transport margins within the borders of the importing country. In Polderland, the imports of goods at cif valuation exceeds imports of goods at fob valuation by about 5%. Also the imports of goods at cif-prices can deviate from the corresponding invoiced values.

Exports of services includes the following borderline cases:

- transportation of exported goods after they have left the frontier of the exporting country when provided by a resident carrier;
- a correction for overestimating imports of goods due to cif (fob) valuation, e.g. when also the transport costs included in the cif (fob) valuation are taken care of by the resident importer or resident carriers on his behalf. In Polderland, this correction amounted to about 0.2% of total exports.
- minor processing and repair activities on behalf of non-residents;
- financial services by amount of the explicit commissions and fees;
- insurance services by the amount of the services charged;
- expenditure on hotels and museums by non-resident tourists and business travellers;
- services of owner-occupied holiday homes of non-residents;
- royalties and license fees for the use of patents, copy-rights, trademarks, industrial processes and franchises.

Similar borderline cases apply to the imports of services.

Like imports and exports, property income payable and receivable can also contain intra-company flows. This does not only apply to reinvested earnings on direct investment, but does also to dividends and interest. The same applies of course to the corresponding financial flows and assets and liabilities.

Income like compensation of employees and dividends should in principle be recorded gross of taxes and social security premiums in the national accounts. However, in compilation practice, it may be rather difficult to translate the net flows recorded into gross flows.

### *Balance sheet*

The balance sheet does not show explicitly the size and composition of foreign direct investments. These are included in the shares and other equity. Also the loans and other accounts payable may include stocks and flows pertaining to foreign direct investment, e.g. loans by the foreign parent-company to its resident daughter. The size of foreign direct investment could be shown as a memorandum item. This establishes also a clear linkage to the reinvested earnings on foreign direct investment.

The external balance sheet does not include non-financial assets. This applies even to land, mineral reserves, dwellings and offices on the domestic territory owned by non-residents. The ownership of all such property is recorded as financial assets, i.e. as part of shares and other equity. The revenue in terms of an operating surplus is recorded as a reinvested earnings on direct foreign investment. A similar treatment is applied for non-financial assets abroad owned by residents, e.g. holiday homes abroad owned by residents.

The changes in balance sheet shows the changes in net worth broken down by "causes". The total increase of 65 billion euro in 2008 was mainly due to nominal holding gains of 110 billion euro. The effect of these holding gains were mitigated by exports exceeding imports by 43 billion euros, i.e. the Rest of the world has imported more than it has exported.

*Supplementary tables on imports and exports*

Table 6.7d shows a breakdown of the imports of Polderland by 11 product-groups. In Polderland, nearly 80% of imports consist of manufactured products. Furthermore, only five of the other product-groups are significant for imports: business services (7%), agricultural products (5%), products from mining and quarrying (4%), hotel and restaurant services provided to tourists and businessmen abroad (4%) and transport and communication services (2%). The imports of the other five product-groups, like construction, repair and social and personal services, are less than a half % of imports.

Table 6.7e shows a breakdown of the Polderland exports by the same 11 product-groups. Exports is also dominated by the manufactured products; they amount to over 75% of total exports. Furthermore, for exports the same product-groups as for imports are significant. However, their relative importance differs. For example, hotel and restaurant services is only 2% of the exports, while amounting to 4% of the imports. Similarly, transport and communication services are 7% of the exports, while the corresponding imports are only 2% of the total imports.

Table 6.7d and 6.7e allows also to calculate net exports (exports minus imports) by product. This is done in table 6.7f.

Table 6.7d on imports by product also shows for which purpose they are used. This information can be derived from the supply and use table (see section 6.8). Nearly 50% of the imports by Polderland are used up as intermediate consumption, while 30% is exported. The remainder of the imports are used as capital formation (e.g. software and computers) or final consumption expenditure by households and the government.

Similarly, table 6.7e also shows the origin from the exported goods and services. Seventy percent of exports has been produced domestically, while thirty percent was imported. The trade and transport margin on exporting imported goods can be derived by comparing the value of the imports for export (127 billion euros in 2008) with the value of exports out of imports (143 billion euros in 2008). This margin was 26 billion euros in 2008 (more than 20% in terms of the imported value).

Import duties, import subsidies, export taxes and export subsidies act as incentives and dis-incentives for importing and exporting. However, these are not shown in the current account. This can be resolved by adding them as memorandum items to the tables on imports and exports.

In Polderland no import subsidies and export taxes exist. As a consequence, in Polderland only import duties and export subsidies are relevant. Only these are therefore shown as memorandum items.

## **6.7.2 Discussion**

This section discusses the relevance of the description of the flows and stocks with the Rest of the World. Two topics are discussed: the delimitation of the Rest of the World and the classification of flows and stocks. They are discussed in view of administrative concepts (e.g. a customs border), economic theory and monetary policy.

*The delimitation of the Rest of the World*

The national economy in the national accounts is based on the concept of economic territory. The basic idea is that the world consists of national economies, i.e. non-overlapping economic

territories with their own enterprises, citizens, government and institutional arrangements. However, some alternative notions of a national economy are also meaningful.

A major alternative is a tribal notion of the national economy. This can be defined in terms of the ethnic and cultural backgrounds of citizens and enterprises. Following this notion, Turkish people living and working in the Netherlands should be regarded as members of the Turkish economy. Similarly, Dutch farmers emigrated to Australia or Canada should be regarded as members of the Dutch economy. Furthermore, even foreign affiliates of Dutch multinationals could be regarded as part of the Dutch economy. This implies also that the foreign controlled corporations on the Dutch economic territory should not be regarded as part of the Dutch economy. The tribal notion of an economy can shed an entirely different light on transfers and sales. For example, it can explain why expatriates send a lot of money to their family in their home-country. Furthermore, it can reveal the importance of intra-company trade and transfer pricing. In the standard national accounts, the tribal notion is applied in sub-sectoring the domestic sectors, e.g. the sub-sector foreign controlled corporations. However, it is not applied for the rest of the world and for the sector households.

'National' economies can also be delimited by other criteria, like the existence of a common currency and the absence of customs.

#### *Flows and stocks*

The tables on the relationships with the Rest of the World provide an aggregate picture. A breakdown of the flow and stocks of the national economy by domestic sector or industry can reveal the roles played by the various industries and sectors in the external relations. For example, what are the major importing and exporting industries and how important are imports for households final consumption expenditure. Similarly, a breakdown of the Rest of the World by country, region or international institution (e.g. EU) can reveal the roles played by countries, regions and international institutions.

In order to show the consequences of changes in exchange rate, the flows and stocks should be distinguished into those denominated in the national currency and those in other currencies. For example, imports and loans denominated in national currency should be distinguished from those that are traded or denominated in other currencies. Furthermore, in order to distinguish between short-run and long run consequences financial assets and liabilities should be broken down by degree of liquidity.

The valuation of imports at cif value and exports at fob value correspond to the official valuation applied in customs data. They seem therefore to be very attractive principles of valuation. However, there are also some clear drawbacks:

- cif and fob values actually registered may not comply to the official principles, e.g. often invoiced values are recorded without any adjustment for conditions of sale other than cif or fob. As a consequence, the more homogeneous valuation of cif/fob values vis-à-vis the market value on the invoice is to a great extent an illusion.
- Cif and fob values in the European Union correspond to the values at the European border; they generally do not correspond to the national border. The same may apply to imports and exports in other customs unions. As a consequence, the cif-values of the imports by a European country from non-European countries can be quite heterogeneous. For example, the valuation of imports of goods by Germany may correspond to the Spanish border, the Dutch border or the Greek border.
- The link with the financial transactions corresponding to the imports and exports of goods becomes blurred.

- The link with the imports and exports of transport services becomes blurred. The same applies to the corresponding financial transactions.

All these drawbacks are caused by introducing a valuation that can differ from the one agreed upon by all parties involved, i.e. the market value used for the invoice. The remedy is therefore to value imports and exports of goods at invoice values. In deflating the invoice values changes in the conditions of delivery should be recorded as a change in the volume (quality) of the imports and exports.

The standard national accounts do not show implicit transfers by the government with the rest of the world. For example, the following transfers are not recorded:

- special tax benefits for exporting companies;
- implicit import taxes, like import quota and excessive public health requirements for specific products or for products from specific countries.
- implicit export subsidies, like the use of free government facilities.
- implicit transfers to other countries, e.g. selling oil or natural reserves to other countries at clearly below world market prices for political reasons.

Similarly, for business, the national accounts does not record:

- the implicit sales of knowledge and management-skills with the rest of the world. Knowledge and management-skills are by their nature often best sold to the Rest of the World in an indirect way, i.e. by starting up a new local company. This implies that the dividends and the reinvested earnings on direct foreign investment include not only a remuneration of the money invested but also a payment for transfer of knowledge and management skills.
- The negative external effects for other countries of production processes that pollute the air or water (e.g. the nuclear plant of Tsjernobyl).

The contributions by the national government to international organisations and supra-national authorities are recorded as transfers in the standard national accounts. However, these contributions could generally be regarded as payments for goods and services. For example, they often amount to contracting out former activities of the national government, e.g. peace keeping, international diplomacy, development aid and legislation. From this point of view, they should only be regarded as transfers when the contributions are mainly intended for redistribution, e.g. the EU granting subsidies to farmers or the UN distributing food and medicine.

Payments by one government to another in order to provide military assistance could also be regarded as the sales and purchase of goods and services. A case in point are the payments by Saudi-Arabia and Kuwait to the USA for fighting against the Iraqi army. The consequence for the USA national accounts would be more exports and a lower final consumption by the government, i.e. a rather different picture of who is consuming American defence services. It would imply no change in Domestic Product and National Income.

The Rest of the World account is interesting for monetary policy, in particular when flows and stocks denominated in national currency are explicitly shown. It shows the supply and demand for the national currency from the non-financial side of the accounts and from the financial side of the accounts. It can also be used to study the consequences of non-financial transactions on the financial transactions and vice versa.

### 6.7.3 Summary

The standard national accounts describe the relations of the national economy with the rest of the world in terms of a coherent set of accounts in current prices, with explicit links to prices, volumes and real values and with tables classifying imports and exports by product-group.

De delimitation of the national economy and the flows and stocks reflects clearly economic principles. The standard concept of the national economy corresponds to all units with a centre of economic interest on the territory of that country. The national economy in the standard national accounts does not correspond to administrative concepts based on customs and nationality. Flows and stocks with the rest of the world are identified on the basis of economic ownership. It does not correspond to ownership in a legal sense. For example, in cases like financial leasing a change of ownership is imputed.

However, in several other respects economic principles are ignored. For example, contributions to supra-national authorities and international organisations are not recorded as purchases. Similarly, intra-company trade is not systematically distinguished from other imports and exports. Furthermore, various implicit sales, like those of knowledge and management in case of direct foreign investment, are not recorded as such.

The national accounts description of the relations with the Rest of the World is not a direct reflection of what can be readily observed, e.g. it includes various imputations like reinvested earnings on direct foreign investment, the services of owner-occupied holiday homes and insurance services implicit in the gross insurance premium.

In the next generation of guidelines, imports and exports by product group should be valued at invoice value.

## 6.8 Industries and the input-output framework

### 6.9.1 Description

The input-output framework focuses on a specific part of the national economy. It simultaneously describes the domestic production process by industry (or product), the supply of products (domestic output, imports) and the use of products (intermediate consumption, capital formation, final consumption, exports). It provides a detailed picture of the supply and use of goods and services, economic growth, inflation and productivity.

A description of the historical background of the input-output framework can be found in sections 2.3 and 3.4. On input-output analysis in general, see e.g. Miller and Blair (1985).

#### *Four types of input-output tables*

Four types of input-output tables should be distinguished:

1. the statistical supply and use table (industry by product table);
2. the analytical supply and use table (industry by product table);
3. the (analytical) industry by industry table;
4. the (analytical) product by product table.

The supply and use table is a mix of data by industry and by product. It is the input-output table most suited for statistical purposes, as its format fits best with the statistical information that can be obtained from producers. The supply and use tables can also be used for analytical purposes. This often requires some extra rearrangement of the data. The statistical supply and use tables are then transformed in an analytical supply and use table.

The other two types of input-output tables are symmetric tables. They are not optimal for statistical purposes but serve specific analytical purposes. The industry by industry table focuses on the analysis of the interaction between industries. The product by product tables focuses on the analysis of the interaction between products.

The supply and use table shows interactions between, on the one hand, specific industries and, on the other hand, the supply and use of specific products and vice versa. The supply and use table can therefore be used for the analysis of such interactions. However, by introducing assumptions or extra statistical information, they can also be used for the analysis of the interaction between industries or between products.

#### *Industries*

The description of industries is embedded in the supply and use tables and the industry-by-industry input-output tables.

The classification by sector gives one view on the major actors in the national economy. It groups producers on the basis of the type of organisation<sup>85</sup> that is producing, e.g. a corporation, the government or a household. The classification by industry gives an alternative view with respect to the producers. It groups producers by their major product.

The units used for the industry-classification ('establishments') can coincide with the units used for the sector classification ('institutional units') like corporations, unincorporated enterprises, government bodies and non-profit institutions. However, some of these institutional units are engaged in a combination of activities that are also organised and accounted for separately. These producers should then be partitioned into smaller and more homogeneous producer units. Establishments are thus

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<sup>85</sup> Institutional unit.

Table 6.8a The supply table in billion euros Polderland 2008

	Output at basic prices by (domestic) industries					Imports	Total Supply at basic prices	Trade & Transp. Margins	Taxes on products	minus Subsidies on products	Total Supply at purchasers' prices
	Goods producers	Trade & transport producers	Financial & business services producers	Social & personal services producers	Total output by product						
<i>Products</i>											
Agricultural products	43	0	0	0	43	20	63	13	1	-1	76
Manufacturing products	414	11	2	21	448	356	804	134	58	-2	994
Construction	106	1	3	1	111	1	112	0	7	0	119
Trade & transport services	13	241	3	3	265	20	285	-147	8	-3	143
Financial & business services	17	14	278	13	317	32	349	0	14	-2	361
Social & personal services	28	14	1	203	246	1	247	0	2	0	249
Total output	621	281	287	241	1430	430	1860	0	90	-8	1942
Suppl. information											
<i>Sectors</i>											
Non-financ. corp.	551	211	154	88	1004						
Financial corp.	0	0	70	0	70						
General government	7	0	7	133	147						
Households	63	70	56	20	209						
Total output at basic prices	621	281	287	241	1430						



Table 6.8b The supply table in terms of relative shares by type of supply, Polderland 2008

	Output at basic prices by (domestic) industries					Imports	Total Supply	Trade & Transp.	Taxes on	minus Subsidies	Total Supply
	Goods producers	Trade & transport producers	Financial & business services producers	Social & personal services producers	Total output by product		at basic prices	Margins	products	on products	at purchasers' prices
Products											
Food&flowers	7%	0%	0%	0%	3%	5%	3%	-9%	1%	13%	4%
Manufacturing	67%	4%	1%	9%	31%	83%	43%	-91%	64%	25%	51%
Construction	17%	0%	1%	0%	8%	0%	6%	0%	8%	0%	6%
TTC-services	2%	86%	1%	1%	19%	5%	15%	100%	9%	38%	7%
BFC-services	3%	5%	97%	5%	22%	7%	19%	0%	16%	25%	19%
PSP-services	5%	5%	0%	84%	17%	0%	13%	0%	2%	0%	13%
Total output	100%	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%
Suppl. inform. Sectors											
Non-financ. corp.	89%	75%	54%	37%	70%						
Financial corp.	0%	0%	24%	0%	5%						
General government	1%	0%	2%	55%	10%						
Households	10%	25%	20%	8%	15%						
Total output	100%	100%	100%	100%	100%						

Table 6.8c The supply table in terms of relative shares by product and sector, Polderland 2008

	Output at basic prices by (domestic) industries					Imports	Total Supply	Trade & Transp.	Taxes on	minus Subsidies	Total Supply
	Goods producers	Trade & transport producers	Financial & business services producers	Social & personal services producers	Total output by product		at basic prices	Margins	products	on products	at purchasers' prices
Products											
Food&flowers	68%	0%	0%	0%	68%	32%	100%	21%	2%	-2%	121%
Manufacturing	51%	1%	0%	3%	56%	44%	100%	17%	7%	0%	124%
Construction	95%	1%	3%	1%	99%	1%	100%	0%	6%	0%	106%
TTC-services	5%	85%	1%	1%	93%	7%	100%	-52%	3%	-1%	50%
BFC-services	5%	4%	80%	4%	91%	9%	100%	0%	4%	-1%	103%
PSP-services	11%	6%	0%	82%	100%	0%	100%	0%	1%	0%	101%
Total output	33%	15%	15%	13%	77%	23%	100%	0%	5%	0%	104%
Suppl. inform. Sectors											
Non-financ. corp.	55%	21%	15%	9%	100%						
Financial corp.	0%	0%	100%	0%	100%						
General government	5%	0%	5%	90%	100%						
Households	30%	33%	27%	10%	100%						
Total output	43%	20%	20%	17%	100%						

	Input by industry (Interm. cons., Gross Value Added)					Final consumption				Gross	Exports	Total						
	Goods producers	Trade, transport producers	Financial, business services producers	Social, personal services producers	Total input	House-holds	Government other non-market output	social benefits via m.p.	Total	Capital Formation		Use at purchasers' prices						
<i>Products</i>	(Intermediate consumption)					(Final uses)												
Agricultural products	39	1	0	1	41	9	0	0	9	0	26	76						
Manufacturing products	250	45	31	28	354	184	0	5	189	82	369	994						
Construction	33	2	9	7	51	1	0	2	3	63	2	119						
Trade & transport services	0	25	9	6	40	56	0	1	57	0	46	143						
Financial & business services	73	44	47	20	206	90	9	5	104	23	28	361						
FISIM	0	0	0	0	22	0	0	0	0	0	0	22						
insurance services	3	1	1	1	6	20	0	0	20	0	0	26						
services of owner-occupied dw.	0	0	0	0	0	30	0	0	30	0	0	30						
other	70	43	46	19	178	40	9	5	54	23	28	283						
Social & personal services	13	7	5	20	45	44	114	43	201	1	2	249						
Use of products	408	124	101	82	737	384	123	56	563	169	473	1942						
Cons. of fixed capital	31	23	35	25	114	<table><tr><td>Taxes on products</td><td>Subs.on products</td><td>NDP market pr.</td></tr><tr><td>90</td><td>-8</td><td>661</td></tr></table>							Taxes on products	Subs.on products	NDP market pr.	90	-8	661
Taxes on products	Subs.on products	NDP market pr.																
90	-8	661																
Compens. employees	107	89	82	115	393													
wages and salaries	85	73	67	90	315													
employers' social contributions	22	16	15	25	78													
Other taxes on production	3	1	3	1	8													
minus Other subs.	-4	-1	-1	-1	-7													
Operating surplus/Mixed income	76	45	67	19	207													
FISIM-correction at national level					-22													
Net Value Added at basic pr.	182	134	151	134	579	90	-8	661										
Output at basic prices	621	281	287	241	1430													
<i>Supplementary information</i>																		
Capital formation	46	34	52	37	169													
Capital stock at the begin	1112	825	1255	897	4089													
Capital stock at the end	1156	857	1305	932	4250													
Average capital stock	1134	841	1280	915	4170													
Volume of labour	3.3	2.8	2.6	3.6	12.3													

	Input by industry (Interm. cons., Gross Value Added)					Final consumption				Gross Capital Formation	Exports	Total Use at purchasers prices
	Goods producers	Trade, Transport producers	Financial, commerc. services producers	Social, personal services producers	Total input	House-holds	Government other non-market output	social benefits in kind	Total			
<i>Products</i>	(Intermediate consumption)					(Final uses)						
Agricultural products	0.0%	0.0%		0.0%	0.0%	0.0%			0.0%		4.0%	1.3%
Manufacturing products	-2.0%	0.0%	10.7%	12.0%	0.3%	7.6%		0.0%	7.4%	6.5%	5.7%	4.1%
Construction	6.5%	0.0%	0.0%	0.0%	4.1%	0.0%		0.0%	0.0%	5.0%	0.0%	4.4%
Trade & transport services	-100.0%	19.0%	12.5%	0.0%	5.3%	5.7%		0.0%	5.6%		2.2%	4.4%
Financial and business services	21.7%	4.8%	6.8%	5.3%	11.4%	5.9%	12.5%	25.0%	7.2%	15.0%	7.7%	10.1%
FISIM					10.0%							10.0%
insurance services	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%			5.3%			4.0%
services of owner-occupied dw.						3.4%			3.4%			3.4%
other	22.8%	4.9%	7.0%	5.6%	11.9%	8.1%	12.5%	25.0%	10.2%	15.0%	7.7%	11.4%
Social and personal services	-7.1%	0.0%	0.0%	0.0%	-2.2%	2.3%	5.6%	2.4%	4.1%	0.0%	0.0%	2.9%
Use of products	1.5%	5.1%	7.4%	5.1%	3.5%	6.1%	6.0%	3.7%	5.8%	7.0%	5.3%	4.9%
Cons. of fixed capital	3.3%	9.5%	6.1%	0.0%	4.6%							
Compens. employees	3.9%	4.7%	10.8%	4.5%	5.6%							
wages and salaries	-3.4%	0.0%	3.1%	-1.1%	-0.6%							
employers' social contributions	46.7%	33.3%	66.7%	31.6%	41.8%							
Other taxes on production	0.0%	0.0%	0.0%	0.0%	0.0%							
minus Other subs.	0.0%	0.0%	0.0%	0.0%	0.0%							
Operating surplus/Mixed income	1.3%	4.7%	11.7%	11.8%	6.2%	Taxes on	Subs.on	NDP				
FISIM-correction at the national level					10.0%	products	products	market pr.				
Net Value Added at basic pr.	2.8%	4.7%	11.0%	5.5%	5.7%	5.9%	0.0%	5.8%				
Output at basic prices	2.0%	5.2%	9.1%	4.8%	4.5%							

	Input by industry (Interm. cons., Gross Value Added)					Final consumption				Gross	Exports	Total
	Goods producers	Trade, transport producers	Financial, commerc. services producers	Social, personal services producers	Total input	House-holds	Government other non-market output	social benefits via m.p.	Total	Capital Formation		Use at purchasers prices
<i>Products</i>	(Intermediate consumption)					(Final uses)						
Agricultural products	0.0%	0.0%	0.0%	0.0%	0.0%	-0.2%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%
Manufacturing products	-4.6%	-4.6%	-4.6%	-4.6%	-4.6%	1.1%	0.0%	1.2%	1.1%	0.0%	-2.1%	-2.3%
Construction	2.0%	2.0%	2.0%	2.0%	2.0%	2.6%	0.0%	3.6%	3.1%	3.6%	2.4%	2.6%
Trade & transport services	2.6%	4.6%	2.6%	3.6%	2.6%	2.1%	0.0%	2.3%	1.8%	0.0%	1.7%	2.1%
Financial and business services	7.4%	6.9%	6.7%	7.1%	6.7%	2.8%	2.6%	2.4%	2.0%	4.9%	4.3%	4.9%
FISIM					5.0%							5.0%
insurance services	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%	4.6%
services of owner-occupied dw.						3.5%			3.5%			3.5%
other	7.7%	7.5%	7.0%	5.6%	7.2%	0.0%	0.0%	0.0%	0.0%	4.5%	3.7%	5.2%
Social and personal services	2.3%	2.3%	2.3%	2.3%	2.3%	5.0%	1.8%	2.5%	2.6%	2.5%	2.6%	2.5%
Use of products	-1.7%	1.8%	1.6%	1.4%	-0.2%	1.8%	1.7%	1.8%	1.9%	1.7%	-1.2%	0.3%
Cons. of fixed capital	1.7%	1.7%	1.7%	1.7%	1.7%							
Compens. employees	2.6%	2.8%	2.6%	3.4%	3.0%							
wages and salaries	-4.6%	-1.8%	-4.6%	-2.2%	-3.2%							
employers' social contributions	44.9%	30.9%	54.3%	30.1%	38.2%							
Other taxes on production	0.0%	0.0%	0.0%	0.0%	0.0%							
minus Other subs.	0.0%	0.0%	0.0%	0.0%	0.0%							
Operating surplus/Mixed income	-7.3%	2.3%	9.8%	5.6%	1.0%	Taxes on products	Subs.on products	NDP market pr.				
FISIM-correction at national level					5.0%							
Net Value Added at basic pr.	-1.6%	1.9%	5.5%	3.6%	2.1%	0.1%	2.0%	1.8%				
Output at basic prices	-1.4%	1.8%	4.0%	2.6%	0.9%							

Table 6.8g. The use-table: volume-changes 08/07

	Input by industry (Interm. cons., Gross Value Added)					Final consumption				Gross	Exports	Total
	Goods producers	Trade & transport producers	Financial & commerc. services producers	Social & personal services producers	Total input	House-holds	Government other non-market output	social benefits via m.p.	Total	Capital Formation		Use at purchasers' prices
<i>Products</i>	(Intermediate consumption)					(Final uses)						
Agricultural products	0.0%	0.0%		0.0%	0.0%	0.2%			0.0%		2.7%	1.3%
Manufacturing products	2.7%	4.8%	16.0%	17.4%	5.1%	6.4%		-1.1%	6.3%	6.5%		6.5%
Construction	4.4%	-2.0%	-2.0%	-2.0%	2.0%	-2.5%		-3.5%	-3.0%	1.4%	-2.3%	1.8%
Trade & transport services	-100.0%	13.8%	9.7%	-3.4%	2.6%	3.4%		-2.3%	3.7%		0.5%	2.2%
Financial and business services	13.3%	-2.0%	0.1%	-1.7%	4.3%	3.0%	9.7%	22.1%	5.2%	9.6%	3.3%	4.9%
FISIM					4.8%							4.8%
insurance services	-4.4%	-4.4%	-4.4%	-4.4%	-4.4%	0.6%			0.6%			-0.6%
services of owner-occupied dw.						0.0%			0.0%			0.0%
other	14.0%	-2.4%	0.0%	0.0%	4.4%	8.1%	12.5%	25.0%	10.2%	10.0%	3.8%	5.9%
Social and personal services	-9.2%	-2.2%	-2.2%	-2.2%	-4.3%	-2.5%	3.7%	-0.1%	1.6%	-2.4%	1.6%	0.4%
Use of products	3.2%	3.2%	5.8%	3.7%	3.7%	4.1%	4.3%	1.9%	3.9%	5.2%	6.4%	4.6%
Cons. of fixed capital	1.6%	7.7%	4.3%	-1.7%	2.8%							
Compens. employees	1.2%	1.8%	8.0%	1.1%	2.6%							
wages and salaries	1.2%	1.8%	8.0%	1.1%	2.6%							
employers' social contributions	1.2%	1.8%	8.0%	1.1%	2.6%							
Other taxes on production	0.0%	0.0%	0.0%	0.0%	0.0%							
minus Other subs.	0.0%	0.0%	0.0%	0.0%	0.0%							
Operating surplus/Mixed income	9.3%	2.3%	1.7%	5.9%	5.1%	Taxes on products	Subs.on products	NDP market pr.				
FISIM-correction at national level												
Net Value Added at basic pr.	4.5%	2.7%	5.2%	1.8%	3.7%	5.8%	-2.0%	3.8%				
Output at basic prices	3.4%	4.9%	3.4%	2.2%	3.6%							

	Input by industry (Interm. cons., Gross Value Added)					Final consumption				Gross Capital Formation	Exports	Total Use at purchasers' prices
	Goods producers	Trade & transport producers	Financial & commerc. services producers	Social & personal services producers	Total input	House-holds	Government other non-market output	social benefits via m.p.	Total			
<i>Products</i>	(Intermediate consumption)					(Final uses)						
Agricultural products	39	1	0	1	41	9	0	0	9	0	26	76
Manufacturing products	264	47	32	28	371	182	0	5	187	82	377	1017
Construction	32	2	9	7	50	1	0	2	3	61	2	116
Trade & transport services	0	24	9	6	39	55	0	1	56	0	45	140
Financial and business services	68	41	44	19	193	88	9	5	102	22	27	344
FISIM	0	0	0	0	21	0	0	0	0	0	0	21
insurance services	3	1	1	1	6	19	0	0	19	0	0	25
services of owner-occupied dw.	0	0	0	0	0	29	0	0	29	0	0	29
other	65	40	43	18	166	40	9	5	54	22	27	269
Social and personal services	12	7	5	20	44	42	112	42	196	1	2	243
Use of products	415	122	99	81	738	377	121	55	553	166	479	1936
Cons. of fixed capital	30	23	34	25	112							
Compens. employees	104	87	80	111	382							
wages and salaries	89	74	70	92	325							
employers' social contributions	15	12	10	19	56							
Other taxes on production	3	1	3	1	8							
minus Other subs.	-4	-1	-1	-1	-7							
Operating surplus/Mixed income	82	44	61	18	205	Taxes on products	Subs.on products	NDP market pr.				
FISIM-correction at national level					-21							
Net Value Added at basic pr.	185	131	143	129	567	90	-8	649				
Output at basic prices	630	276	276	235	1417							

Table 6.8i The production and generation of income account for an industry: goods producers

	2007	2008	08-07	08/07	2008 comp.
I. Production account					
R Output at basic prices by product	609	621	12	2%	100%
agricultural products	43	43	0	0%	7%
manufacturing products	413	414	1	0%	67%
construction	101	106	5	5%	17%
trade & transport services	12	13	1	8%	2%
financial & business services	14	17	3	21%	3%
social & personal services	26	28	2	8%	5%
U Intermediate consumption by product	402	408	6	1%	100%
agricultural products	39	39	0	0%	10%
manufacturing products	255	250	-5	-2%	61%
construction	31	33	2	6%	8%
trade & transport services	3	0	-3	-100%	0%
financial & business services	60	73	13	22%	18%
social & personal services	14	13	-1	-7%	3%
Consumption of fixed capital	30	31	1	3%	
Net value added (at basic prices)	177	182	5	3%	
II. Generation of income account					
R Net value added at basic prices	177	182	5	3%	
U Compensation of employees	103	107	4	4%	100%
wages and salaries	88	85	-3	-3%	79%
employers' social contributions	15	22	7	47%	21%
Other taxes on production	3	1	-2	-67%	
Other subsidies on production	-4	-1	3	-75%	
Operating surplus	75	75	0	0%	



Table 6.8j Supplementary information in current prices for an industry: goods producers

	2007	2008	08-07	08/07	2008 comp.
<b>I. Forward-linkages by industry/type of use</b>					
Output at basic prices by destination	609	621	12	2%	100%
intermediate consumption	234	222	-12	-5%	36%
goods producers	176	160	-16	-9%	26%
trade & transport producers	24	24	0	0%	4%
financial & commercial serv. producers	18	20	2	11%	3%
social & personal serv. producers	16	18	2	13%	3%
final consumption	120	129	9	8%	21%
gross capital formation	55	58	3	5%	9%
goods producers	41	43	2	5%	7%
trade & transport producers	9	10	1	11%	2%
financial & commercial serv. producers	3	3	0	0%	0%
social & personal serv. producers	2	2	0	0%	0%
exports	200	212	12	6%	34%
<b>II. Backward-linkages by industry/type of use</b>					
Intermediate consumption by origin	402	408	6	1%	100%
output of domestic industries at basic prices	250	246	-4	-2%	60%
goods producers	176	160	-16	-9%	39%
trade & transport producers	34	41	7	21%	10%
financial & commercial serv. producers	32	38	6	19%	9%
social & personal serv. producers	8	7	-1	-13%	2%
imports	120	128	8	7%	31%
trade&transport margin	30	32	2	7%	8%
taxes on products	2	2	0	0%	0%
less subsidies on products	0	0	0		0%
Gross capital formation by origin	43	46	3	7%	100%
output of domestic industries	31	33	2	6%	72%
imports	12	13	1	8%	28%
<b>III. Capital stock and capital formation by asset</b>					
Gross capital formation by asset	43	46	3	7%	100%
dwellings	0	0	0		0%
other buildings and structures	10	11	1	10%	24%
machinery and equipment	29	30	1	3%	65%
cultivated assets	0	0	0		0%
software	3	4	1	33%	9%
other intangible fixed assets	0	0	0		0%
changes in inventories	1	1	0	0%	2%
net acquisitions of valuables	0	0	0		0%
Capital stock begin	1075	1112	37	3%	
Capital stock end	1125	1156	31	3%	
Average capital stock	1100	1134	34	3%	

Table 6.8k Prices, volumes and key-ratios for an industry: goods producers

	2007	2008
Price-changes		
1 Output	2.4%	-1.4%
2 Intermediate consumption	2.8%	-1.7%
3 Consumption of fixed capital	1.8%	1.7%
4 Value added	1.8%	-1.6%
5 Capital formation	1.8%	1.7%
6 Compensation of employees (price per hour worked)	2.1%	2.6%
7 General price-change of goods and services	2.2%	0.7%
Volumes		
1 Output (% change)	5.2%	3.4%
2 Intermediate consumption (% change)	5.6%	3.2%
3 Consumption of fixed capital	3.5%	1.6%
4 Value added (% change)	4.3%	4.5%
5 Capital formation (% change)	5.7%	3.9%
6 Volume of labour (% change)	0.6%	1.2%
7 Volume of labour (abs. change)	0.02	0.04
8 Volume of labour (level, millions)	3.30	3.34
9 Labour productivity-change	3.7%	3.3%
Keyratios		
1 Output per employee (full-time eq.)	184.5	185.9
2 Value added per employee	53.6	54.5
3 Compensation of employees per employee	31.2	32.0
4 Operating surplus per employee	22.7	22.5
5 Capital intensity (average cap. stock/value added)	6.2	6.2
6 Relative size in Domestic employment	28%	27%
7 Relative size in Domestic Product	28%	28%

a combination of partitioned and non-partitioned institutional units. For example, a company consisting only of a dairy-farm should be regarded as one establishment. It belongs to the industry agriculture. The major output of this establishment is milk, which is sold to the milk factory. However, the dairy-farm may also be engaged in some secondary activities, e.g. producing cheese or having a camping site during summer. In another company some of these activities may be organised separately, e.g. there is a separate shop in the village for direct sales to households. The company consists then of two separate units: the dairy-farm that belongs to the industry agriculture and the shop that is part of the industry retail trade.

The tables on Polderland distinguish four industries:

1. establishments mainly engaged in agriculture, manufacturing and construction ('goods producers');
2. establishments mainly engaged in trade, transport and communication ('trade & transport producers');
3. establishments mainly engaged in business, financial and commercial services ('financial & business services producers');
4. establishments mainly engaged in public, social and personal services ('social and personal services producers').

The first industry covers all the goods-producers. The other three industries consist of producers of services.

Each of the four industries is characterised by its major product. This implies that also four products should be distinguished. However, the characteristic output of the goods producers has been split into three different products: agricultural products, manufacturing products and construction. This reflects that it is in general convenient to distinguish more products than industries<sup>86</sup>. As a consequence, six product-groups are distinguished for Polderland.

#### *The supply table*

In the columns of the supply table the output of each of the four industries is shown. The second column of table 6.8a shows that the output of the goods-producers was 621 billion euros in 2008. More than 90% of this output pertained to goods: the output of agricultural products was 43 billion euros, of manufacturing products 414 billion euros and of construction 106 billion euros. The secondary output, i.e. the three types of services, accounted for about 10%.

The output of the trade and transport and communication industry was 281 billion euros. The output of the two other industries were similar in size: the industry business, financial & commercial services produced for 287 billion euros, while the industry public, social and personal services was responsible for 234 billion euros. Also these services industries produced little secondary output.

The total output by the domestic industries of Polderland was 1430 billion euros in 2008. The biggest industry was that of the goods-producers: 621 billion euros, while manufacturing was the most important output: 448 billion euros.

Table 6.8a provides also supplementary information on the link between industries and sectors. The bottom-part of the second column shows that most of the goods-producers belong

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<sup>86</sup> There are two major reasons for this. Firstly, available data on products (e.g. Foreign Trade-statistics are often published with great detail such as 2000 products) are often much more detailed than those on industries. Secondly, the characteristic output of one industry may be subject to substantially different tax regimes and prices (e.g. in case of price discrimination). Proper compilation and analysis necessitates then that different products are distinguished.

to the sectors non-financial corporations (551 billion euros). However, also the self-employed in the sector households contributed a sizeable amount of output (61 billion euros).

The rows at the bottom show the total output of each sector and how it is spread over the various industries. For example, the total output of the sector non-financial corporations was 1004 billion euros, of which 551 billion euros was produced by the goods-producers industry, 211 billion euros by the trade & transport services industry, 154 billion euros by the financial & business services industry and 88 billion euros by the social and personal services industry.

The supply table shows the total supply of the national economy by product. This implies that not only the output by domestic industries but also the imports are described. Table 6.8a shows that imports was 430 billion euros of which 355 billion pertained to manufacturing products.

The supply table in billion euros can easily be translated into relative shares. This is illustrated by tables 6.8.b and 6.8c. Table 6.8b shows amongst others the relative importance of the various products in the output of each industry. For example, the output of the goods producers consisted for 7% of agricultural products, for 67% of manufacturing products, for 17% of construction and for 10% of services. Similarly, table 6.8c shows the relative importance of industries for the supply of each product.

#### *The use table*

The inputs used by industries for producing their outputs are shown in the use table (table 6.8d). Three types of inputs are distinguished:

- intermediate consumption by product;
- consumption of fixed capital (no distinction is made by type of fixed asset);
- net value added by value added category.

Net value added is the balancing item of output, intermediate consumption and consumption of fixed capital. As a consequence, the values of the three inputs add up to the value of the output.

For example, the second column in table 6.8d shows the inputs for the goods-producers. In order to produce 621 billion euros of output, 408 billion euros (66%) was spend on intermediate consumption (e.g. 39 billion euros on agricultural products), while consumption of fixed capital amounted to 31 billion euros (5%). As a consequence, net value added (at basic prices) was 182 billion euros (29%). The major items in value added are compensation of employees (17% of output) and operating surplus/ mixed income (12%).

Mixed income refers to the income of the self-employed. It is labelled mixed income as it can be regarded as a mixture of compensation of employees (labour income) and operating surplus (capital income). In the description of the non-financial corporations (section 6.3), mixed income was included in the operating surplus.

The columns of the four industries add up to the national economy. This implies also that the national totals can be broken down and explained in terms of the relative importance of the four industries. For example, the goods-producers account for 55% of the intermediate consumption of Polderland, but only for 31% of its value added.

The use-table describes the production process by domestic producers and shows the use of all goods and services by product-group. The use of goods and services includes not only intermediate consumption. It includes also final consumption, capital formation and exports. They are also shown by product-group. For example, the exports of 473 billion euros consist of 26 billion euros of agricultural products, 369 billion euros of manufacturing products, 2 billion euros of construction, 28 billion euros of financial & business services and 2 billion euros of social & personal services.

### *Valuation at basic prices and purchasers' prices*

The supply and use tables describe the supply and use for all goods and services and for each product group. However, output and imports are valued at basic prices, while the various uses are valued at purchasers' prices. This difference in valuation principle reflects the difference in perception between suppliers and users of products.

For suppliers, trade and transport margins by other producers are not regarded as their own revenues. The same applies to the taxes they have to pay on the production or sale of their products, e.g. excise duties and VAT. The opposite applies to subsidies on the production or sale: by the supplier they are regarded as part of their revenues on that production or sale. Examples of such subsidies on products are subsidies on food production, public transport and housing. This perception of suppliers differs from that of users of products, as the users are most interested in what they have to pay for each product, i.e. including all trade and transport margins and taxes, but excluding subsidies to be received by suppliers.

Starting from the supply at basic prices, the identity between supply and use for all products can be achieved by adding taxes on products and deducting subsidies on products. This is shown in the supply-table of Polderland. An alternative way is to start from the use at purchasers' prices and deduct taxes on products and add subsidies on products.

In order to achieve the identity between supply and use for each product group, the trade and transport margins should be reallocated over the product-groups. For example, the supply at basic prices of a manufacturing product excludes the trade and transport margins paid by the users of that product. So, these trade and transport margins should be added to the supply at basic prices in order to arrive at the use of manufacturing products at purchasers' prices. However, in the supply at basic prices, the trade and transport margins are included in the product-group trade, transport and communication services. These trade and transport margins should therefore be deducted at the product-group trade and transport services.

### *Imputations*

The use table reveals that there is something special with the use of business, financial and commercial services. Intermediate consumption of these services by industry does not add up to the national total: 70 billion euros plus 44 billion euros plus 47 billion euros plus 20 billion euros add up to 181 billion euros and not to 203 billion euros. The 22 billion euros extra intermediate consumption pertains to the so-called financial intermediation services indirectly measured (FISIM, see section 6.3 on financial corporations). These imputed values are regarded as intermediate consumption not allocated to specific industries. This implies also that value added, operating surplus and mixed income do not add up to the national totals; they should be 22 billion euros less than the sum of the four industries.

The use table of Polderland also explicitly shows the roles played by three other imputed values:

- insurance services by amount of the implicit service charge (26 billion euros);
- imputed services of owner-occupied dwellings (30 billion euros);
- other non-market output by the government by amount of the production costs (123 billion euros).

The four imputed values are quite substantial in Polderland: they represent 30% of Domestic Product and 13% of household final consumption.

### *Value added at basic prices and Domestic Product at market prices*

The use table shows value added at basic prices. As a consequence, the national total of value added in the use table is Domestic Product at basic prices. Domestic Product at market prices can be obtained by adding the taxes on products and subtracting the subsidies on products.

Both are shown in the supply table. So, Domestic Product at market prices is 579 plus 90 minus 8 is 661.

#### *Supplementary information on assets and labour inputs*

In order to complete the description of the production process, the use table needs to be supplemented with information on assets and labour inputs.

The use table shows the consumption of fixed assets as an input for the production process of each industry. In many use tables, capital formation is only shown for the national economy as a whole and no information is provided on the capital stocks. The link between these variables can be clarified by showing capital formation and capital stock by industry. This information can then also be used to calculate measures of capital productivity and capital intensity.

The use table shows the values of compensation of employees and mixed income. However, it does not show the volumes of labour underlying them. For analysis, several measures for the volume of labour are relevant. For productivity analysis, hours worked seems to be the most meaningful volume of labour. However, in order to show links between the production process and the labour market, full-time equivalents and jobs are also important measures for the volume of labour.

The use table on volume changes could be supplemented with information on the volume changes of labour and capital stock and the key-ratios that can be derived from them, like changes in capital and labour productivity.

#### *Tool for calculating, presenting and analysing changes in values, prices and volumes*

The supply and use table are a major tool for calculating, presenting and analysing changes in values, prices and volumes. Table 6.8.e shows the value changes in the use; these are decomposed into changes in prices and changes in volumes in tables 6.8.f and 6.8.g. A similar decomposition can also be made for the supply table.

In order to calculate the changes in prices and volumes consistently, the supply and use tables should be drawn up in prices of the previous year (or another fixed base year) (see table 6.8.h). All differences between the supply and use tables in current prices and those in constant prices are price changes. All differences between the supply and use tables of the previous year in current prices and those of the current year in constant prices are volume changes. The identities that hold in the supply and use tables in current prices do also hold for those in prices of the previous year. For example, supply and use should balance for each product and the net value added of each industry is still the balancing item of output, intermediate consumption and consumption of fixed capital.

The major advantage of drawing up a supply and use table in prices of the previous year is that it provides an explicit check on the consistency of the deflation procedures and the measurement of the volume changes.

#### *Tool for compiling and tool for analysis*

These supply and use tables are a major tool for compiling data, as they provide a systematic statistical description which contains a lot of identities and plausibility-checks. However, the supply and uses tables are also a major tool for applied economic analysis.

The supply table (table 6.8a) shows the principal and secondary outputs of various industries and their absolute and relative importance in view of total supply for the national economy. This information can be used for analysing the market shares of domestic and foreign producers for various products.

The supply table also shows for the total supply the relative size of trade- and transport margins and taxes and subsidies on products. With sufficient detail, this information can be used to calculate:

- the impact of changes in one of these components on the value and price of the total supply, e.g. the impact of an extra subsidy or lower transport margins on the supply of food.
- the impact of changes in the total supply on the value of one of these components, e.g. the impact of changes in the supply of petrol on tax revenues.

The use table (table 6.8b) shows the way the supply of various types of products is used up by the national economy. This information can be used to analyse the impact of changes in the volume or price of the total supply on the national economy, e.g. the effect of a big price increase in oil. It can indicate which industries and which types of use (e.g. final consumption expenditure by households) are most affected by these changes.

The use table shows also the various cost-components of domestic output by industry. This information can be used to calculate the consequences of changes in the prices of one of these components (e.g. compensation of employees or intermediate consumption of oil) on the value of output by industry. It can also be used to calculate the effects of changes in the output of an industry on the demand for specific products or factor services like labour. For example, a boosting transport industry induces an extra demand for the inputs typically used by this industry, like petrol, trucks and truck-drivers.

The supply and use tables discussed above show the interaction between total supply and the various types of use. However, they do not show the interaction between production by domestic industries and the various types of use. They also do not show the interaction between imports and the various types of use, e.g. intermediate consumption and capital formation by industries. For analysing these important interactions, the use of goods and services in the use table should be split into three parts:

- Use of domestic output (including trade and transport margins excluding net taxes on products);
- Use of imports (including trade and transport margins excluding net taxes on products);
- Net taxes on products.

Such a *more analytic use-table* allows calculating the effects of changes in the output of domestic industries on the various types of use or changes in the various types of use on production by domestic industries.

The analytic supply and use tables can be transformed into *symmetric input-output tables*<sup>87</sup>. Two types of symmetric input-output tables should be distinguished:

- product-by-product;
- industry-by-industry.

The product-by-product format is focused on analysing the interaction between developments in product-markets. The industry-by-industry format is focused on analysing the interaction between developments in industries. The symmetric input-output tables can be regarded as transformations of the information in the more analytic supply and use tables. These transformations require usually extra data or extra assumptions.

For applied economic analysis, the analytic supply and use tables are in general to be preferred to symmetric input-output-tables, because:

- only supply and use tables can show interactions between products and industries;
- information in the supply and use tables is in general less based on assumptions and more on data;

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<sup>87</sup> An extended discussion of the transformation of supply and use tables into symmetric input-output tables can be found in Konijn (1994) and Eurostat (2008).

- supply and use tables can also be used for showing interactions between products and products or between industries and industries. This requires extra data or assumptions. However, these data and assumptions can be fully targeted on the issue at stake. This contrasts with compiling symmetric input-output tables, as this requires the transformation of a whole table without explicitly targeting at the issue at stake.

#### *Link with production and generation of income accounts*

The description of industries in the input-output framework is focused on the variables from the production and generation of income accounts. This can be made explicit by drawing up these two accounts for a specific industry (see table 6.8i).

The production and generation of income account for industries is similar to that for sectors. However, important extra detail is added by breaking down output and intermediate consumption by product, like in the supply and use table. Table 6.8i shows e.g. that the major output of the goods-producers are their characteristic outputs manufacturing products, construction and agricultural products, but shows also that some services are produced as secondary output.

The information on industries could also include information from the analytic input-output tables. This is shown in table 6.8j. It shows amongst others the link between the output of the industry goods-producers and the various uses, including a breakdown of intermediate consumption by industry.

Table 6.8j also shows a breakdown of gross capital formation by asset. Such a breakdown is essential for analysing the development of an industry e.g. for tracing substitutions made between intermediate consumption and capital formation (e.g. renting a building or owning a building). The information on capital formation by asset can also be used to calculate the consequences of extra investments by one industry. However, this requires that the purchase of the asset is decomposed into product-groups. For example, in case of the purchase of a building this implies that the costs of ownership transfer should be assessed and then be broken down into business services and taxes.

Table 6.8k provides an overview of the major prices, volumes and key-ratios for one industry, i.e. good producers.

## **6.9.2 Discussion**

This section discusses the relevance of the input-output framework. The input-output framework overlaps to a great extent with the standard national accounts descriptions of the various sectors. As a consequence, many remarks made on the relevance of the latter descriptions are also pertinent for the input-output tables, e.g. the link with the business accounts.

The discussion in this section will not repeat these remarks. Instead the spotlight will be put on three issues specific for the input-output framework:

- First, the industry- and product classification will be discussed in view of production functions and consumer behaviour.
- Secondly, attention is drawn to some specific conventions and their implications for analysis.
- Thirdly, prices and volumes are discussed in view of the consistency of the accounting system and international comparability.



### *The industry and product classification*

The industry- and product-classifications play a central role in the input-output framework. The two types of classifications are linked, as each industry is characterised by its principal product.

Industry and product classifications can be based on different criteria (supply-criteria, demand-criteria and size, see Economic Classification Policy Committee, 1993/1994)<sup>88</sup>.

For productivity analysis, products and their producers should have been classified by type of production process. For analysis of demand, products should have been classified by similarity of purpose (e.g. luxury goods should be grouped) or similarity of marketing relationship (e.g. sales channel). For input-output analysis, the same classification of products should be used for supply and demand. The classification should also provide a balanced description, i.e. the size of each class should not be too small or too large a part of the national economy. For international classifications, this implies that the quantitative importance of most of the classes should be substantial in a great number of countries.

The industry and product classifications in the standard national accounts are necessarily based on a mixture of these criteria<sup>89</sup> and also the fruits of history. They are mainly defined from a producers' point of view. They are not perfect for analysing supply and demand. Users of national accounts data on industries and products, should have a good notion of what is actually included and excluded in each of the groups and their implications. For example, the industry real estate activities includes the services of owner-occupied dwellings, the industry forestry excludes those units mainly involved in environmental protection of forests and the industry insurance excludes social security funds.

The establishments in one industry can have quite different production functions. This may reflect substantial differences in vertical integration, ancillary activities contracted out (e.g. cleaning, transport, administration and canteen services), machinery rented, labour contracted in via temporary agencies and marketing strategy (e.g. compare two goods fully identical except that for one 60% of the production costs are spent on marketing while for the other this is only 5%). It may also reflect differences between legal and illegal producers or between producers in different regions.

For the analysis of final consumption expenditure, there are also alternative classifications in the standard national accounts. The functional classifications for final consumption expenditure are presented in the sections on the government and households (sections 6.5 and 6.6).

For the analysis of the costs of producers, there is also a standard functional classification: the classification of producers by purpose (COPP). For example, it shows the administrative expenses and the expenses for environmental concerns.

### *Some specific conventions*

A major distinction in the standard national accounts is that between market producers and other non-market producers. The SNA93 gives a rather obscure definition. The ESA95 is in this respect much more specific. It adopts a mix of two criteria: an institutional criterion (e.g. all self-employed and all corporations are by definition market producers) and an economic criterion (the sales by market producers cover at least 50% of their production costs). As a consequence of the institutional criterion, some producers with sales not covering 50% of

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<sup>88</sup> Two other criteria are also relevant: the link with specific taxes or subsidies (e.g. the link with excise duties) and the expected fluctuations in price changes. For example, for goods with relatively volatile developments like oil and agricultural products a relatively detailed classification should be used.

<sup>89</sup> For final consumption expenditure, there is a separate functional classification reflecting similarity of purpose, see the previous section.

their production costs are nevertheless regarded as market producers, e.g. farmers or public transport companies.

The input-output tables are a tool for analysing interactions between product-markets, producers and factor services like labour and capital. However, the input-output tables do not only cover real interactions but also some pure bookkeeping interactions. Examples of the latter are:

- a rise in the rent of dwellings increases by definition the price and value of imputed rent for the services of owner-occupied dwellings;
- a rise in the production costs of government services increases by definition the value of government output and *ceteris paribus* also the value of final consumption expenditure by the government. This relationship applies also to the prices and volumes. For example, an increase in the wage-rate of civil servants by definition increases the price of government output and final consumption expenditure by the government.

Furthermore, some interactions are by definition absent. This is for example the consequence of the convention to record all other non-market output by the government as final consumption expenditure by the government. This applies also to output actually serving as inputs for the domestic production process, like research, training and protection of employees, infrastructure and cleaning the environment. As a consequence, the importance of such government output is ignored in input-output analysis fully based on national accounts input-output tables. Comparability over time may also be affected, in particular when the other non-market output decreases due to an increase in sales, fees, levies and toll. *Ceteris paribus* this would decrease the value added of those paying for this output (e.g. transport companies paying toll) and therefore also Domestic Product.

For analysing the composition of the outputs and inputs by industry it is important to realise that:

- the outputs of ancillary activities are not recorded separately; all the inputs consumed by an ancillary activity are treated as inputs into the principal or secondary activity which it supports. Ancillary activities may be, for example, marketing, accounting, storage and cleaning.
- Goods or services produced and consumed within the same accounting period and within the same establishment are not separately identified<sup>90</sup>. They are therefore not recorded as part of the output or intermediate consumption of that establishment. This may pertain for example to seeds and plants for sowing and planting, hard coal consumed in the production of briquettes by coal mines and electrical energy consumed by power stations.
- Minor processing, maintenance, servicing or repair on behalf of other producers is to be recorded net, i.e. excluding the value of the goods involved. By contrast, when the goods are subject to a substantial physical change, the transaction should be recorded gross, i.e. as the purchase and sale of the goods involved.
- Durable goods can be rented or subject to operating leasing. In such instances, they are recorded as capital formation and capital stock in their owner's industry; in the industry of the user intermediate consumption by amount of the rental is recorded.
- Persons working via temporary agencies are recorded as being employed in the industry of these agencies and not in the industries in which they are actually working. As a consequence, in the latter industries, the payments for these persons are recorded as intermediate consumption (and not as compensation of employees). Labour contracted out is treated similarly.

Compensation of employees does not reflect the costs of labour for the employer, as e.g. subsidies on wages and taxes for employers on their wage bill are not taken into account.

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<sup>90</sup> An exception is made for research.

However, such a concept of cost of labour can easily be incorporated in the input-output tables by splitting the other subsidies on production in wage-subsidies and other subsidies, by making a similar split for other taxes on production and by introducing the cost of labour as a memorandum item.

Net operating surplus of other non-market output, e.g. by the government, is assumed to be nil. This implies that production costs and value added exclude any charge for entrepreneurial risk and exclude any opportunity revenue of the financial capital invested. This underestimates the economic importance of other non-market output vis-à-vis market output (see section 6.5).

The purchase of consumer durables is not regarded as capital formation. However, capital formation includes cars, refrigerators, television or furniture bought for production purposes. This applies also to such assets rented out to households, e.g. operating lease of a car. Not recording the purchase of consumer durables as a type of capital formation ignores a major type of investment by households and gives a wrong picture of consumption over time (see section 6.6).

The value of market output is based on a rather limited concept of revenue from production. This does not include holding gains (e.g. by a trader in oil or coffee) or revenue from the sale of non-produced assets, like patents (e.g. by a research company), long-term contracts with young talented soccer-players (e.g. by a professional soccer-club) and long-term contracts on broadcasting matches. In some specific industries such revenue constitute a major part of what is regarded as normal business revenue. This underestimates the economic importance of these industries. Furthermore, when such industries develop differently over time than the rest of the national economy, also the national indicators of economic growth are affected.

A major limitation of the input-output tables is their scope. It excludes several variables very relevant for understanding the supply and use of products and the production processes involved. Cases in point are interest paid by producers and consumers, taxes on income and wealth paid by producers and consumers, investment grants received by producers and the realised holding gains of households on equity and dwellings used for buying cars, furniture and a new kitchen. They also exclude parts of the supply of labour, e.g. the unemployed.

### *Prices and volumes*

The measures of prices and volumes in the input-output tables are not isolated or partial measures. They are embedded in the conceptual framework of the national accounts. This allows to use and compile them in direct relationship to all the other concepts. However, this requires that:

- the price and volume measures should be consistent with the concepts in current prices;
- price and volume measures should be mutually consistent, as they are defined as a decomposition of a value.

In order to understand the consequences of this consistency, we will look at output and the weighting of prices and volumes as cases in point.

A first case in point is *output*. Market output is valued at market prices. As a consequence, the volume of output is the volume that results by dividing the value of the market output by a market price. This volume corresponds to the service provided and not to outcomes, as the market price corresponds also to the service provided. For example, the volume of medical treatment is not how healthy the patient is after the treatment. The price and the volume of the medical treatment correspond to the service itself, e.g. the number of consultations and operations.

Output includes only output that is produced within the national accounts production boundary. As a consequence, the volume of output excludes output outside this production boundary, e.g. unpaid household services or volunteer services.

A second case in point is the *weighting of prices and volumes*. The volumes are weighted by the corresponding prices (and vice versa). This implies that the volumes of luxury cars, ordinary cars, bread, alcoholic drinks, preventive health care, plastic surgery and government services are weighted by their market prices/unit costs. The higher the market price (unit cost) the higher the weight.

The weighting of prices and volumes should also be consistent in terms of the index formulas used. For intertemporal comparison, Fisher-indexes are recommended as the best theoretical formulae for both prices and volumes. As a practical approximation, Laspeyres volume-indices and Paasche price-indices in combination with annual rebasing (chaining) is put forward. In both cases, the price- and volume-indices result in consistent value-indices. Consistency would not be met when both the price- and volume-index are of the Laspeyres-type.

For comparison of two countries, also the Fisher-indexes are recommended for both prices and volumes. For multilateral comparison, the so-called EKS-formulae is recommended. This formulae approaches the Fisher-indexes but maintains also transitivity for all possible pairs of countries.

Figures on the level of Domestic Product (per capita) of various countries can be compared by multiplication with the exchange rate of the currencies of these countries. However, such a comparison is no proper comparison of the 'volumes' underlying Domestic Product, because relative prices are likely to differ between countries. This problem can be solved by applying one set of prices to all countries: this set can be that of one country or an average of the prices in a group of countries (e.g. by applying the EKS-formulae).

However, care should be taken for a proper interpretation of these figures, because the quantities consumed in a country are not independent of their relative prices. Some goods are consumed in high quantities because prices are low (e.g. flowers in the Netherlands or wine in France) and some are consumed in low quantities because their prices are high (e.g. alcohol in the Nordic countries). Furthermore, the same quantity of a good may have a different meaning ('utility') in different countries, e.g.

- the quantity of energy required for heating depends on the climate in each country: living (producing) in a cold country requires more heating than living (producing) in a country with a milder climate.
- drinking water may be scarce and costly in some countries, while plentiful and nearly free in other countries.
- similar goods are appreciated differently in different countries, e.g. the consumption of pork or intestines is popular in some countries and unpopular in others;
- some goods and services are really country-specific, e.g. in Iceland the water from hot springs is a major source of heating.

International comparison of Domestic Product growth rates is based on employing for all countries their national prices as weights. This implies that *growth rates of Domestic Product for countries that have exactly the same volume of production and intermediate consumption will not be the same when their prices differ*. It also implies that a high price for production with low productivity increases tends to reduce the growth rate of Domestic Product. For example, if for some reason, the estimated increase in the productivity of government services is relatively low, then relatively well paid civil servants will lead to a low overall growth rate.

The prices used in calculating Domestic Product and its growth rate depend also on the valuation principle chosen. In the international guidelines, Domestic Product is measured at

market prices. Valuation at basic prices or factor costs will result in a somewhat different weighting scheme, i.e. reducing the weight of highly taxed products and increasing the weight of highly subsidised products. Whether these alternative weighting schemes are fundamentally better for international comparison is to be doubtful<sup>91</sup>, because:

- the weighting scheme is only changed in a limited way; use of purchasing power parities is a more fundamental solution to reduce the influence of differences in relative prices;
- the quantities consumed are not independent of the market prices: higher taxes may lead to lower quantities of final consumption and high subsidies may lead to high quantities of final consumption;
- Hicks (1940) suggests that value added at factor costs reflects the remuneration of the various 'factors of production' and is therefore well suited for comparing productivity. However, following standard economic theory, an enterprise does not want to maximise value added at factor costs or its operating surplus at factor costs, but wants to maximise its after tax profits, i.e. the operating surplus after deduction of interest payments and all taxes on income, wealth, etc. (see also Frisch, 1955, footnote 1 on p. 19)

### 6.8.3 Summary

The input-output framework provides a detailed description of the domestic production process and the supply and use of products in terms of values, prices and volumes. As such it describes:

- the supply of products by domestic producers and the Rest of the World;
- the demand by domestic producers for factor services like labour and capital;
- the demand for products by domestic producers, domestic consumers and the Rest of the World;
- the interaction between supply of products and demand of products;
- the interaction between demand for factor services and demand for products.

The input-output framework consists of one statistical input-output table (the statistical supply and use table) and three more analytic tables (the analytical supply and use table, the industry by industry table and the product by product table). The distinction between statistical and analytical input-output tables reveals that input-output analysis requires data that generally can only be compiled by also using some explicit assumptions. All four input-output tables are economic models; each designed for a different purpose.

A remarkable feature of the input-output framework is the way it combines statistical description and applied economic analysis. It incorporates not only a statistical description but also the input-output model.

The input-output framework is an entirely consistent model. The different perceptions of the various actors have been met in various ways. In some cases, a smart synthesis was possible. This applies in particular to value supply at basic prices and use at purchasers' prices. In another case, different concepts are applied for different actors. For example, the purchase of a car for business purposes is recorded as capital formation, while the purchase of a car for consumption purposes is not recorded as capital formation. However, the general solution was to adopt a producers' point of view. This is evidenced by the production boundary (not welfare oriented), the industry and product-classifications (generally not the

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<sup>91</sup> This is for example advocated in the United Nations guidelines of 1947 (UN, 1947, p. 37; quoted in Bos, 1993a, p.79).

consumers' point of view), the definition of insurance output and the valuation of income in kind.

The industry and product-classification are not rigorously based on theoretical notions, e.g. the notion of a production function. This mainly reflects that a classification for statistical purposes should also be practical and balanced. Nevertheless, the industry and product classification can be made more relevant by better taking into account theoretical considerations and policy issues.

The input-output framework is not a direct reflection of what can readily be observed. It is a specific selection of what can be observed readily: it focuses on the description of the production process and the supply and use of products and ignores the allocation and redistribution of income and financial flows. It transforms what can be observed readily into a model consistent in terms of valuation, delimitation and time of recording. Consistency and relevance require even to include prices and volumes which can not be observed readily. In order to increase the relevance various imputations are included, e.g. consumption of fixed capital, other non-market output and the services of owner-occupied dwellings.

The input-output tables provide a description reflecting national institutions, national prices, national regulations, national preferences and national circumstances. Without a proper interpretation of these factors, international comparison of figures from the input-output tables can therefore be misleading.

The Polderland-tables demonstrate how even the statistical supply and use table can serve as a powerful tool for the analysis of economic growth, prices and productivity. The various identities and relationships in this table can be easily interpreted as causal relationships, e.g. supply influencing demand or vice versa. The analytical input-output tables can be used to calculate second and higher order effects of changes in prices, tax rates, trade and transport margins, volume etc. These bookkeeping analyses based on fixed ratios can be made more sophisticated by also taking account of economic behaviour (see section 8.3).

## 6.9 Satellites on social policy, human capital and for policy analysis

### 6.9.1 Introduction

The guidelines recommend developing satellite accounts for aspects not or not sufficiently covered by the central framework, i.e. by the sector accounts and the supply and use framework<sup>92</sup>. Satellites can range from simple supplementary tables to complete alternative accounting systems.

In presenting the different perspectives, the Polderland-statistics already contain several examples of simple supplementary tables, e.g. tables on business income before and after tax, a table with alternative concepts of household income and a table with government revenue and expenditure.

However, many other satellites are also very meaningful. Examples are:

- Regional accounts, e.g. tables showing by region the size and development of Domestic Product, employment and income per capita. Regional accounts are very important. They do not only serve to provide basic macro-economic statistics for major political regions within a nation, for allocating the revenues for some taxes to regions (e.g. in Canada) or granting European funds to poor regions. For understanding economic growth, regional accounts are essential, as economic growth is often location specific and can differ substantially within a nation. Awarding this year's Nobelprize in economics to Paul Krugman reflects the importance of this issue. National totals can hide wide regional differences in economic conditions and performances. International disparities in GDP per capita are often smaller than differences among regions of the same country. Population and economic activities and their contribution to economic growth and employment are also generally fairly unevenly distributed among regions. Urban regions are often specialized in services, while agriculture, mining activities and manufacturing are mainly located in peripheral regions. Innovation is generally concentrated in some specific regional clusters. The elderly population is often increasingly concentrated in rural and intermediate regions, while immigration of asylum-seekers is often concentrated urban regions. Regional clusters often do not confine themselves to national borders: neighbouring regions of different countries may be economically much more intertwined than with regions in their own country.
- A satellite on labour and population, e.g. tables linking employment statistics and statistics on the population to the national accounts. Links can be made in particular with compensation of employees, unemployment benefits, pension benefits and expenditure on education and care.
- A Social Accounting Matrix (SAM)<sup>93</sup>. A SAM is a matrix presentation<sup>94</sup> which elaborates the linkages between supply and use tables and the sector accounts. A SAM

<sup>92</sup> According to the SNA93 (para 2.88), the central framework incorporates also:

- tables showing financial flows and stocks sector by sector;
- functional tables, e.g. government expenditure by function;
- tables on population and employment.

Tables on non-financial transactions sector by sector are not regarded as part of the central framework. This is surprising considering their great importance for compilation and analysis.

<sup>93</sup> The history of the SAM is discussed in section 3.4.

<sup>94</sup> A complete matrix presentation should not be regarded as the essence of a SAM: a SAM could also be presented as a set of sector accounts (see e.g. tables 6.6g,h,i) in combination with an input-output table. The advantage of the matrix-presentation is that it provides a relatively concise and complete overview. However, when the matrix presentation is used to show more complex accounting systems, the content of each cell becomes often rather difficult to grasp and the empty cells without any meaning often dominate. The advantage of a set of sector accounts in combination with an input-output table is that the distinct logic of the two types of tables is kept separate and not mixed up.

commonly provides additional information on the level and composition of employment, via a subdivision of compensation of employees by type of person employed. This subdivision applies to both the use of labour by industry, as shown in the use tables, and the supply of labour by socio-economic subgroup, as shown in the allocation of primary income account for sub-sectors of the sector households. In this way, the supply and use of various categories of paid labour is shown systematically (see also Pyatt, 1991, Pyatt, 1994 and SNA93, Chapter XX).

- A satellite on the interaction between the environment and the national economy (see e.g. De Haan and Keuning, 1996; tables X.7 and X8 in the Dutch National Accounts 2001; SEEA: UN, 2003b). Such a satellite can show the flows and stocks of various environmental substances by origin (emission by consumers, emission by producers by industry and imports) and by destination (absorption by producers, exports and contribution to the national environment).
- Public sector accounts, i.e. accounts for the sector government and the subsector non-financial corporations controlled by the government plus the subsector financial corporations controlled by the government (see e.g. table D3.5 in the Dutch National Accounts 2001);
- A satellite on non-profit institutions, i.e. a grouping of non-profit institutions in the sectors government, corporations and non-profit institutions serving households (see e.g. UN, 2003a);
- A satellite on the role of tourism in the national economy;
- A satellite on the importance of research & development (see e.g. Bos, Hollanders and Keuning, 1994);
- A satellite on care, e.g. showing the size, composition and development of the production and consumption of the various types of care (values, volumes and prices of inputs and outputs, productivity) and their links to the various ways of financing care (e.g. social security, private insurance or direct expenditure by households) (see also OECD, 2000 and Sunga and Swinamer, 1986 on satellites about health care).
- A satellite for estimating tax revenues, e.g. by showing the transition from income according to the national accounts towards taxable income;
- Satellites on micro-macro links with business accounts and micro-data on household income and expenditure (see Ruggles and Ruggles, 1999, Smeeding and Weinberg, 2001 and Maki and Nishiyama, 1993). A major function of such satellites can be to simply clarify the major differences between macro-economic concepts and their micro-economic counterparts. In this way, the implications of stories, statistics or analyses at a micro-economic level (e.g. about the profits of corporations or the income of households) can be understood in terms of national accounting concepts and statistics (and vice versa). Such satellites could serve to put micro-economic data in a macro-economic context, i.e. to enable macro-economic conclusions from micro-economic data. A very specific purpose can be to estimate tax revenues, e.g. to show the transition from the national accounting concept of entrepreneurial income towards the taxable income of corporations.
- A welfare-oriented satellite on household production. Such a satellite can quantify the economic importance of paid and unpaid household production (see e.g. Goldschmidt-Clermont and Pagnossin-Aligisakis, 1999 and Landefeld and McCulla, 2000). The Statistical Office of the UK now regularly publishes such a satellite.
- A satellite about transaction costs. The importance of transaction costs for economic growth has been stressed by Nobelprize-winner Douglas North (see e.g. North, 1990). In their estimates for the United States, Fuess and van den Berg (1996) regard government outlays on administration, defence, diplomacy, law and order and public safety as transactional activities, i.e. intermediate activities that do not generate value added. They



also regard a major part of finance-insurance-real estate (FIRE) and of the wholesale-retail sector (e.g. expenditure on marketing) as transactional activities.

### *Major features of satellites*

Satellites can differ in many respects from the central framework:

- By showing more detail where necessary and leaving out superfluous detail;
- By enlarging the scope of the accounting framework by adding non-monetary information, e.g. on pollution and environmental assets;
- By enlarging the scope of the accounting framework by grossing net concepts, e.g. the concept of subsidies and income transfers could be extended to include also some tax expenditures.
- By changing some basic concepts. For example, the concept of capital formation can be enlarged by amount of the expenditure on research & development or the expenditure on education. Social benefits could also be netted for all taxes and social contributions that have to be paid from them. This would drastically improve the comparability over time and space of social benefits.
- By including alternative or supplementary concepts, e.g. a satellite on the public sector can include statistics on public procurement. The latter concept does not exist in the standard national accounts. However, it can be defined easily in national accounts concepts: "public procurement is the sum of intermediate consumption and capital formation by the public sector".

An important feature of satellites is that in principle all basic concepts and classifications of the standard framework are retained. Only when the specific purpose of the satellite definitely requires a modification, changes in the basic concepts are introduced. In such instances, the satellite should also contain a table showing the link between the major aggregates in the satellite and those in the standard framework. In this way, the standard framework retains its role as a framework of reference and at the same time justice is done to more specific analytical needs.

The standard framework does not pay much attention to stocks and flows which are not readily observable in monetary terms (or without a clear monetary counterpart). By their nature, the analysis of such stocks and flows is usually well served by compiling statistics in non-monetary terms, e.g.:

- production within households can most easily be described in terms of hours allocated to the alternative uses;
- education can be described in terms of type of education, the number of pupils, the average number of years of education before obtaining a diploma, etc.
- the effects of pollution are best described in terms of changes in the number of living species, the health of the trees in the forest, the volume of refuse, the amounts of carbon-monoxide and radiation, etc.

The satellites offer a possibility to link such statistics in non-monetary units to the standard national accounts framework. The linkage is possible by using for these non-monetary statistics, as far as possible, the classifications employed in the standard framework, e.g. the classification by type of household or the classification by industry. In this way, a consistent extended framework is drawn up. This framework can then serve as a data base for the analysis and evaluation of all kinds of interactions between the variables in the standard framework and those in the extended part.

### *Welfare*

The standard framework and its major aggregates do not describe changes in welfare (see also sections 3.4 and 6.2 on welfare). Extended accounts can be drawn up which include also the imputed monetary values of, e.g.:

- domestic and personal services produced and consumed within the same households;
- changes in leisure time;
- amenities and dis-amenities of urban life;
- inequalities in the distribution of income over persons.

They can also reclassify the final expenditure on regrettable necessities (e.g. defence) as intermediate consumption, i.e. as not contributing to welfare. Similarly, the damage due to floods and other natural disasters could be classified as intermediate consumption, i.e. as a reduction in welfare.

In this way, one could try to construct a very rough and very imperfect indicator of changes in welfare. However, welfare has many dimensions, most of which are best not expressed in monetary terms. A better solution for measuring welfare is therefore to use, for each dimension, separate indicators and units of measurement. The indicators could be, for example, infant mortality, life expectancy, adult literacy and national income per capita. These indicators could be incorporated in a relatively simple satellite.

An alternative is to develop a very extended system of non-monetary accounts and indicators embedded in a national accounts framework (see Keuning, 1997 and 1998 and Kazemier et al, 1999). Such an ambitious system has clear advantages, but will have to overcome the same practical problems as a big and complex national accounting system. Like the national accounts, its logic and presentation will be difficult to understand for data users, in particular for those not acquainted with the national accounts. Furthermore, the requirements of consistency and completeness are not only the friends of reliable and relevant statistics, but can also be a foe (see sections 7.3 and 7.4). The latter occurs when data turn out to be difficult to reconcile or when bold assumptions are necessary to achieve completeness.

### *Administrative concepts*

In order to attain a consistent, internationally compatible framework, administrative concepts are not employed. However, for all kinds of national purposes, obtaining figures based on administrative concepts can be very important. For example, for estimating tax revenues statistics of taxable income are required. These statistics can be provided by making some modifications to the national accounts statistics. A similar approach could be taken for some concepts used in national economic policy, e.g.:

- inflation used for increasing pensions, unemployment benefits or salaries of civil servants;
- taxes and government used in discussing the optimal size of the collective sector;
- 'strategic sectors' used in national or European economic policy;
- 'business investments' used in national economic policy.

Satellites including simple supplementary tables could do justice to such, usually specifically national, data needs.

In sections 6.9.2-6.9.4, three specific satellites are presented and discussed:

- A satellite account on social policy and expenditure (see section 6.9.2);
- A satellite account on the role of education and human capital in the national economy (see section 6.9.3);
- An accounting model for policy analysis and forecasting (see section 6.9.4).

These satellites illustrate the possibilities of using the standard national accounts as a flexible building-block system.

### 6.7.2 A satellite on social policy and expenditure

The standard national accounts contain a lot of information on revenue and expenditure for social purposes, e.g. social contributions, social benefits, government expenditure by function and final consumption expenditure of households by function. This information can be combined and rearranged to derive a satellite on social policy and expenditure. This is demonstrated by table 6.9.2.

#### *Social risks or needs*

The columns show nine different types of social risks or needs:

1. Sickness;
2. Disability;
3. Old age;
4. Survivors;
5. Children/family;
6. Promotion of employment/Unemployment;
7. Housing;
8. Education;
9. Social exclusion or general neediness.

According to the standard national accounts, all these risks or needs can give rise to social benefits (see e.g. ESA95, paragraph 4.84). Expenditure serving these risks or needs can therefore be labelled as social expenditure.

#### *Breakdown of the social expenditure*

The rows show the various types of expenditure for social purposes. These expenditure are split into two groups:

- Expenditure on social policy; these are all expenditure by the general government. However, it excludes their expenditure as an employer.
- Other social expenditure.

#### *Expenditure on social policy*

The expenditure on social policy consist of:

- Social security benefits in cash and in kind;
- Social assistance benefits in cash and in kind;
- Transfers to other producers, e.g. subsidies for employing long-term unemployed or subsidies to housing corporations in order to reduce their rents.
- Operating costs of the various social policy schemes, e.g. for distributing social benefits, for collecting social contributions or for running various employment projects (workfare).

All these expenditure are to be allocated to the nine different types of social policy. This requires that for each type of expenditure the composition by major scheme is known. In the Dutch national accounts, such a breakdown, e.g. of social security benefits in cash by scheme, is regularly published. The name of the scheme generally already indicates the social function served. However, some schemes pertain to more than one social function. This applies to e.g. the exceptional medical health act (AWBZ) in the Netherlands. Some of the AWBZ-benefits pertain to sickness (e.g. special health care), some to old age (e.g. the financing of homes for the elderly) and some to children/family (e.g. special care for pregnant women and children). Allocation requires then some more information.

By allocating the government expenditure for all its major social policy schemes, the size and composition of government social expenditure can be shown for each type of social policy and for each type of expenditure.

Table 6.9.2 The composition and size of social expenditure in Polderland 2008, bln euro

[illegible]

The table shows that over 50% of the government expenditure on social policy are social security benefits (119 billion euro out of 202 billion euro). These social security benefits focus on three social functions: sickness, disability and old age. The social security benefits in kind mainly consist of health care (included in sickness) and care by homes for the elderly (included in old age).

Social security benefits are no tools for housing and education policy. Expenditure for housing policy mainly consist of individual rent allowances (a social assistance benefit in kind) and transfers to housing corporations (transfers to other producers). Education provided as other non-market output is the major type of expenditure for education policy. Other government expenditure on education include e.g. scholarships (social assistance benefit in cash), free public transport for students and the costs for running the Ministry of Education.

The social function employment/unemployment contains e.g. unemployment benefits (social security benefits in cash), subsidies for employing long term-unemployed (transfers to other producers), the cost for running social workplaces (e.g. employment projects for the handicapped) and the overhead costs for developing and managing the various employment/unemployment schemes.

Government expenditure on social exclusion include e.g. general subsistence benefits in cash, legal assistance to the poor, general care by community centres and services by government institutions fighting alcoholism and drugs addiction.

Two pro memory items have been added to the government expenditure on social policy: social security contributions and total government expenditure. This clarifies the burden of social policy for government finance. The table shows that the government expenditure on social policy are about 55% of total government expenditure and that the social security contributions are sufficient for financing 30% of total government expenditure.

#### *Other social expenditure*

The second group of social expenditure consists of six types of expenditure:

- Pension benefits (funded);
- Other private social insurance benefits;
- Operating costs of private social insurance schemes;
- Unfunded employee social benefits;
- Social assistance benefits in kind by Non-Profit Institutions serving Households (NPISH);
- Social final consumption expenditure by households, i.e. expenditure for the COICOP-functions health, housing, education and social protection.

The table shows that these other social expenditure mainly consists of pension benefits, unfunded employee social benefits and final consumption expenditure by households.

The other social expenditure on sickness consists for nearly 50% of unfunded employee social benefits (e.g. paid sick leave or reimbursement of medical expenses for civil servants) and for nearly 50 % of household expenditure, e.g. on health care.

For the functions disability and children/family there are no other social expenditure. This does not indicate that the government bears all these risks and needs, as these risks may also be covered by private insurance (e.g. against the loss of income due to disability) or by saving. Furthermore, some of the needs may be met by services outside the national accounts production boundary, e.g. the care-taking of children by their parents or family. Similar remarks apply also to other functions: the other social expenditure underscores the efforts by individual households by ignoring private insurance, saving and services outside the standard national accounts production boundary.

Three pro memory items have been added to the other and total social expenditure: contributions to pension schemes, final consumption expenditure by households and national income. The contributions to pension schemes show how much of the current pension benefits

are financed by actual contributions and by property income on contributions paid in previous periods. The difference between the current pension benefits and the pension contributions are used to finance future pension benefits. According to the table actual contributions are only one third of total pension contributions and only half of these contributions are used for paying out current pension benefits.

The final consumption expenditure by households can be used to show the relative importance of the social part of final consumption expenditure by households (about 40% in the table).

National income can be used to derive simple indicators of the burden of social expenditure on the national economy, e.g. social expenditure is 55% of National income.

#### *Value added of the satellite*

The major merits of this satellite are:

- It provides a simple overview on the social policy and expenditure in a country. Together with quantitative and qualitative information on the major underlying social policy schemes, it even provides a fairly complete overview.
- The types of social policy distinguished are meaningful as they reflect different social risks and needs.
- The various types of expenditure are meaningful as they reflect different economic tools for meeting social needs.
- The satellite is derived from the standard national accounts. As a consequence, it has a straightforward link towards the major statistics on the national economy and government finance. The statistics from the satellite can therefore be analysed in the context of the national economy and government finance. Furthermore, national accounts statistics can serve as a data base for compiling the satellite. Finally, the definitions employed are readily available, as they are derived from the standard national accounts definitions.
- The satellite can also be supplemented and refined as a tool of analysis, e.g. by splitting the development of values over time in changes in prices and volumes or by correction social assistance benefits for taxes and social security contributions to be paid.

A somewhat similar satellite can also serve as a link between European/OECD social protection statistics (ESSPROS; Eurostat, 1996; OECD Social Expenditure Data Base; SOCX) and national accounts statistics (see Bos, 2000). Linking national accounts statistics and social protection statistics provides new opportunities for both types of statistics. From the point of view of social protection statistics, it implies that social protection statistics can be related to the official statistics on the national economy. National accounts statistics broken down by social protection scheme can also serve as a check on the completeness and reliability of social protection statistics. Furthermore, the compilation processes of both statistics can be linked. This can save compilation costs, increase reliability and timeliness. European social protection statistics could then become as timely as (future) national accounts statistics, i.e. the delay in publication could change from about 2 years to 8 months, 3 months or perhaps even less.

Similar opportunities apply to the national accounts. From the point of view of the national accounts, social protection statistics can be regarded as a satellite supplementing the standard national accounts. This satellite is relatively easy to derive from the standard tables and is highly relevant for economic and social policy. Furthermore, such a satellite can serve as a check on the reliability and completeness of the standard national accounts figures.

### 6.9.3 A satellite on education and training as human capital

The concept of human capital plays a prominent role in current economic theory and policy. An estimate of the value of human capital stock was already made in 1691 by Petty, the founding father of national accounting. However, in the modern national accounts no concept of human capital is employed. The standard national accounts include many types of revenue and expenditure related to education and training, but are not well designed for analysing the role of education, training and human capital in the national economy. This deficiency can be remedied to a great extent by a satellite (see Bos, 1996d).

The satellite could focus on the supply and use tables. In three steps the standard supply and use tables can be transformed into tables targeted at describing and analysing the role of education, training and courses as human capital in the national economy.

#### *Focus on education, training & courses*

The first step (see tables 6.9.3.a en 6.9.3.b) is to highlight all information relevant and to suppress all irrelevant information. This implies that education and training & courses are explicitly shown as products, while all other products are not shown anymore. Furthermore, compensation of employees is broken down by level of education of the employees involved. The same applies to the volume of labour shown as supplementary information. The first step achieves that the expenditure by households and the government on education and the expenditure by the various industries on training are explicitly shown. It also reveals the extent to which the various industries depend on high-educated personnel.

#### *Compensation of employees is a payment for a factor service*

The second step (see tables 6.9.3.c en 6.9.3.d) is to treat compensation of employees as a payment for a product instead of as payment for a factor service and category of value added. This implies that the supply and use of products is increased with labour supply services, that cross-border workers are providing imports and exports of labour supply services, that the taxes and subsidies on compensation of employees (wage taxes and wage subsidies) are explicitly shown in the supply table and that the price- and volume changes of the various types of labour supply services are incorporated in the supply and use tables. Furthermore, net value added at basic prices is mainly reduced to operating surplus and mixed income. This reflects the changing role of employees in modern services-oriented economies: employees should be regarded as entrepreneurs selling a wide range of different labour supply services. For this specific type entrepreneurs a new industry is introduced: employees. Their operating surplus is equal to compensation of employees minus taxes on wages paid by employees.

#### *Human capital formation and human capital stock*

Employees as entrepreneurs can also invest in human capital to improve or adjust their labour supply services. The third step (see table 6.9.3.e en 6.9.3.f) is therefore to introduce human capital. In the use table, this implies that expenditure on education and training are recorded as capital formation instead of as intermediate consumption or final consumption. Human capital formation should include also some opportunity costs. For employers, the wage costs of the personnel while following the training and courses are a substantial and often even biggest costs of training and courses. Official statistics on business expenditure on training and courses therefore include these opportunity costs. Furthermore, for students the costs of education do not only consist of school fees. The earnings foregone by studying instead of working are generally a much more important cost item. The implication of including the earnings foregone of students as human capital formation is that they should also be recorded

as output, value added and operating surplus. To this end, a new type of industry is added: students producing human capital by amount of their earnings foregone.

In general, those who pay for capital formation are also the owner of the new asset. However, in case of investment grants this does not apply: the government partly finances the capital formation but will not be the owner of the new asset. The government plays also an important role in financing human capital formation, e.g. by providing education as other non-market output or by scholarships. The latter should be regarded as investment grants for human capital formation. The individual persons receiving these investments grants are the owners of the corresponding human capital.



Table 6.9.3a First step: A supply table focusing on education in billion euros Polderland 2008

	<i>Output at basic prices by (domestic) industries</i>					<i>Imports</i>	<i>Total Supply</i>	<i>Trade &amp; Transp.</i>	<i>Taxes on</i>	<i>minus Subsidies</i>	<i>Total Supply</i>
	<i>Goods producers</i>	<i>Trade &amp; transport producers</i>	<i>Financial &amp; business services producers</i>	<i>Social &amp; personal services producers</i>	<i>Total output by product</i>		<i>at basic prices</i>	<i>Margins</i>	<i>products</i>	<i>on products</i>	<i>at purchasers' prices</i>
<i>Products</i>											
Education	0	0	0	35	35	0	35	0	0	0	35
primary	0	0	0	12	12	0	12	0	0	0	12
secondary	0	0	0	14	14	0	14	0	0	0	14
tertiary	0	0	0	9	9	0	9	0	0	0	9
Training & courses	0	0	4	0	4	0	4	0	0	0	4
Other products	621	281	283	206	1391	430	1821	0	90	-8	1903
Total output	621	281	287	241	1430	430	1860	0	90	-8	1942
<i>Suppl. information</i>											
<i>Sectors</i>											
Non-financ. corp.	551	211	154	88	1004						
Financial corp.	0	0	70	0	70						
General government	7	0	7	133	147						
Households	63	70	56	20	209						
Total output at basic prices	621	281	287	241	1430						

Table 6.9.3b. First step: A use table focusing on education in billion euros, Polderland 2008

	Input by industry (Interm. cons., Gross Value Added)					Final consumption				Gross	Exports	Total																					
	Goods	Trade &	Financial	Social	Total	House-	Government		Total	Capital		Use																					
	producers	transport producers	& business services producers	& personal services producers	input	holds	other non- market output	social benefits via m.p.		Forma- tion		at pur- chasers' prices																					
Products	(Intermediate consumption)					(Final uses)																											
Education	0	0	0	0	0	2	33	0	35	0	0	35																					
primary	0	0	0	0	0	0	12	0	12	0	0	12																					
secondary	0	0	0	0	0	1	13	0	14	0	0	14																					
tertiary	0	0	0	0	0	1	8	0	9	0	0	9																					
Training & courses	1	1	1	1	4	0	0	0	0	0	0	4																					
Other products	407	123	100	81	733	382	90	56	528	169	473	1903																					
Use of products	408	124	101	82	737	384	123	56	563	169	473	1942																					
Cons. of fixed capital	31	23	35	25	114	<table><tr><td>Taxes on</td><td>Subs.on</td><td>NDP</td></tr><tr><td>products</td><td>products</td><td>market</td></tr><tr><td></td><td></td><td>pr.</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>							Taxes on	Subs.on	NDP	products	products	market			pr.												
Taxes on	Subs.on	NDP																															
products	products	market																															
		pr.																															
Compens. employees	107	89	82	115	393																												
low skilled	23	11	1	5	40																												
medium skilled	61	65	30	14	170																												
high skilled	23	13	50	96	183																												
Other taxes on production	3	1	3	1	8																												
minus Other subs.	-4	-1	-1	-1	-7																												
Operating surplus/Mixed income	76	45	67	19	207																												
FISIM-correction at the national level					-22																												
Net Value Added at basic pr.	182	134	151	134	579	90	-8	661																									
Output at basic prices	621	281	287	241	1430																												
Supplementary information																																	
Capital formation	46	34	52	37	169																												
Capital stock at the end	1156	857	1305	932	4250																												
Volume of labour	3.3	2.8	2.6	3.6	12.3																												
low skilled	1.0	0.5	0.1	0.2	1.2																												
medium skilled	1.9	2.1	1.5	1.4	7.2																												
high skilled	0.5	0.3	1.1	2.0	3.8																												

Table 6.9.3c Second step: A supply table with labour as a product in billion euros Polderland 2008

	<i>Output at basic prices by (domestic) industries</i>						<i>Imports</i>	<i>Total Supply</i>	<i>Trade &amp; Transp. Margins</i>	<i>Taxes on products</i>	<i>minus Subsidies on products</i>	<i>Total Supply at purchasers' prices</i>
	<i>Goods producers</i>	<i>Trade &amp; transport producers</i>	<i>Financial &amp; business services producers</i>	<i>Social &amp; personal services producers</i>	<i>Employees</i>	<i>Total output by product</i>						
<i>Products</i>												
Labour supply services	0	0	0	0	348	348	2	350	0	44	-4	390
low skilled	0	0	0	0	37	37	1	38	0	2	-4	36
medium skilled	0	0	0	0	152	152	0	152	0	18	0	170
high skilled	0	0	0	0	159	159	1	160	0	24	0	184
Education	0	0	0	35	0	35	0	35	0	0	0	35
primary	0	0	0	15	0	15	0	15	0	0	0	15
secondary	0	0	0	15	0	15	0	15	0	0	0	15
tertiary	0	0	0	5	0	5	0	5	0	0	0	5
Training & courses	0	0	4	0	0	4	0	4	0	0	0	4
Other products	621	281	283	206	0	1391	430	1821	0	90	-8	1903
Total output	621	281	287	241	348	1778	432	2210	0	134	-12	2332
<i>Suppl. information</i>												
<i>Sectors</i>												
Non-financ. corp.	551	211	154	88	0	1004						
Financial corp.	0	0	70	0	0	70						
General government	7	0	7	133	0	147						
Households	63	70	56	20	348	557						
Total output at basic prices	621	281	287	241	348	1778						

[illegible]

Table 6.9.3e Third step: A supply table with human capital in billion euros Polderland 2008

	<i>Output at basic prices by (domestic) industries</i>								<i>Imports</i>	<i>Total Supply</i>	<i>Trade &amp; Transp. Margins</i>	<i>Taxes on products</i>	<i>minus Subsidies on products</i>	<i>Total Supply at purchasers' prices</i>
	Goods producers	Trade & transport producers	Financial & business services producers	Social & personal services producers	Em- ployees	Students as students	Not employed	Total output by product						
<i>Products</i>														
Labour supply services	0	0	0	0	348	0	0	348	2	350	0	44	-4	390
low skilled	0	0	0	0	37	0	0	37	1	38	0	2	-4	36
medium skilled	0	0	0	0	152	0	0	152	0	152	0	18	0	170
high skilled	0	0	0	0	159	0	0	159	1	160	0	24	0	184
Education	0	0	0	35	0	45	0	80	0	80	0	0	0	80
primary	0	0	0	15	0	0	0	15	0	15	0	0	0	15
secondary	0	0	0	15	0	30	0	45	0	45	0	0	0	45
tertiary	0	0	0	5	0	15	0	20	0	20	0	0	0	20
Training & courses	5	4	9	5	0	0	0	23	0	23	0	0	0	23
internal	2	1	2	2	0	0	0	7	0	7	0	0	0	7
external	3	3	7	3	0	0	0	16	0	16	0	0	0	16
Other products	621	281	283	206	0	0	0	1821	430	1757	0	90	-8	1839
Total output	626	285	292	246	348	45	0	1826	432	2210	0	134	-12	2332
<i>Suppl. information Sectors</i>														
Non-financ. corp.	556	215	157	89	0	0	0	1017						
Financial corp.	0	0	72	0	0	0	0	72						
General government	7	0	7	137	0	0	0	151						
Households	63	70	56	20	348	45	0	602						
Total output at basic prices	626	285	292	246	348	45	0	1842						

Table 6.9.3f. Third step: A use table with human capital in billion euros, Polderland 2008

	Input by industry (Interm. cons., Gross Value Added)								Final consumption				Gross	Exports		
	Goods producers	Trade, transport producers	Financial, business services producers	Social, personal services producers	Em- ployees	Students as Students	Not employed	Total input	House- holds	Government other non- market output	social benefits via m.p.	Total	Capital Forma- tion			
Products	(Intermediate consumption)								(Final uses)							
Labour supply services	107	89	82	115	0	0	0	393	0	0	0	0	0	0		
low skilled	23	11	1	5	0	0	0	40	0	0	0	0	0	0		
medium skilled	61	65	30	14	0	0	0	170	0	0	0	0	0	0		
high skilled	23	13	50	96	0	0	0	183	0	0	0	0	0	0		
Education	0	0	0	0	0	0	0	0	0	0	0	0	80	0		
primary	0	0	0	0	0	0	0	0	0	0	0	0	15	0		
secondary	0	0	0	0	0	0	0	0	0	0	0	0	45	0		
tertiary	0	0	0	0	0	0	0	0	0	0	0	0	20	0		
Training & courses	0	0	0	0	0	0	0	0	0	0	0	0	23	0		
internal	0	0	0	0	0	0	0	0	0	0	0	0	7	0		
external	0	0	0	0	0	0	0	0	0	0	0	0	16	0		
Other products	408	124	101	82	0	0	0	737	384	123	56	563	66	473		
Use of products	515	213	183	197	0	0	0	1130	384	123	56	563	169	473		
Cons. of fixed capital	37	28	45	31	45	0	15	201								
Other taxes on production	3	1	3	1	0	0	0	8	Taxes on products	Subs. on products	NDP market prices					
minus Other subs.	-1	-1	-1	0	0	0	0	-3								
Operating surplus/Mixed income	101	44	62	17	303	45	-15	490								
Net Value Added at basic pr.	103	44	64	18	303	45	-15	495				134	-12	617		
Output at basic prices	655	285	292	246	348	45	0	1826								
Capital formation	52	39	62	43	70	0	10	276								
human capital	6	5	10	6	70	0	10	107								
other	46	34	52	37	0	0	0	169								
Capital stock at the end	1171	870	1330	947	1050	0	300	5668								
human capital	15	13	25	15	1050	0	300	1418								
other	1156	857	1305	932	0	0	0	4250								
Volume of labour	3.3	2.8	2.6	3.6	0.0	0.0	0.0	12.3								
low skilled	1.0	0.5	0.1	0.2	0.0	0.0	0.0	1.7								
medium skilled	1.9	2.1	1.5	1.4	0.0	0.0	0.0	6.8								
high skilled	0.5	0.3	1.1	2.0	0.0	0.0	0.0	3.8								

Table 6.9.3g The composition, size and development of expenditure on human capital

	2008	% of total	volume change	price change
<i>Expenditure by the government</i>				
Individual other non-market output	33	30%	5%	4%
primary education	15	14%	5%	4%
secondary education	14	13%	5%	4%
tertiary education	4	4%	2%	4%
Social benefits in kind via market producers	2	2%	2%	3%
Social benefits in cash (scholarships)	2	2%	2%	1%
Total expenditure by the government	37	34%	4%	4%
<i>Expenditure by employers</i>				
Training & courses	23	21%	4%	4%
internal	7	6%	2%	3%
external	16	15%	5%	5%
Total expenditure by employers	23	21%	4%	4%
<i>Expenditure by households</i>				
Expenditure on books, paper and travel costs	2	2%	2%	3%
Schoolfees	2	2%	3%	3%
Earnings foregone	45	41%	2%	4%
Total expenditure by households	49	45%	2%	4%
<i>Total expenditure on human capital</i>	109	100%	3%	4%

Training and courses organised and financed by employers could be regarded as income in kind or investment grants to employees. However, we prefer to record this expenditure as capital formation by the employer.

The accumulation of human capital induces consumption of fixed capital. Following the basic national accounting principles, this should be calculated by the Perpetual Inventory Method. Expected economic life times for investments in education by individuals could be assumed to be 40 years on average; this corresponds to being productive during 40 years, e.g. from 25 to 65 years. In fact, different economic life times should be assumed for different types of human capital formation, for persons differing in age and sex and for different circumstances of work (e.g. diseases linked to certain professions).

The major part of the consumption of human capital pertains to employees. The net operating surplus of these employees is equal to their compensation of employees minus taxes on wages paid by employees and minus consumption fixed capital. Consumption of human capital can also pertain to those not employed, e.g. those receiving unemployment benefits, disablement benefits or those who choose not to have paid employment (e.g. housewives and –men). They do not have benefits related to their human capital. As a consequence, their net operating surplus is negative by amount of their consumption of fixed capital. This is shown in a new industry for the not employed.

For the training and courses by employers, a much shorter life time is realistic, because employers bear the risk that an employee takes a job elsewhere. An expected economic life time of about 5 years could then be a reasonable assumption.

*Supplementary information*

The supply and use table do not show the financing of human capital formation, e.g. the role of investments grants by the government. This aspect can be revealed by a simple supplementary table (see table 6.9.3g).

The satellite can also be extended with a table showing the population by age, sex and level of education and a table linking the population and the employed labour force, e.g. the number of first and second jobs and the number of hours worked.

*Value added of the satellite*

The major features of this satellite are:

- It provides a simple and systematic overview of the role of education and training in the national economy.
- The approach taken is a cost-accounting approach like in the standard national accounts and in the business accounts. Expenditure on education and training and corresponding earnings foregone are regarded as human capital formation. Consumption of human capital is allocated to various industries and groups of persons as a charge on their income. The purpose of the satellite is not to estimate the value of human capital stock. It also does not aim to measure private and social returns to education.
- The satellite shows who pays for human capital formation and how education and training are employed in the national economy. It also shows the role of taxes and subsidies on labour income and the changes in the relative prices of various types of labour.
- The satellite is derived from the standard national accounts. As a consequence, it has a straightforward link towards the major statistics on the national economy and government finance. The statistics from the satellite can therefore be analysed in the context of the national economy and government finance. Furthermore, national accounts statistics can serve as a data base for compiling the satellite. Finally, the definitions employed are readily available, being derived from the standard national accounts definitions.



### 6.9.4 A satellite for policy analysis and forecasting

National accounts statistics and their underlying concepts, like economic growth and government deficit, play a major role in economic and monetary policy (see also chapter 8). Economic models for forecasting the national economy or for policy analyses should therefore incorporate the basic national accounting concepts and identities. However, the standard national accounting system is not designed as an accounting system underlying an extended model for policy analysis and forecasting. In this section, an accounting model designed for this purpose is presented.

#### *The basic set of accounts and tables*

Starting point for this satellite are the standard national accounting tables for the national economy as a whole as presented in section 6.2, in particular tables 6.2g, 6.2h, 6.2i and 6.2j. Tables 6.9.4a-6.9d are derived from these tables but contain various important modifications:

- Some detail is left out. The number of domestic sectors is reduced to three by combining the sectors non-financial corporations and financial corporations. Furthermore, in the accumulation account and the balance sheet all detail is left out.
- Other detail is added, in particular revenue and expenditure related to health care and pensions are now systematically shown. In this way, two important policy issues and their interactions with the rest of national economy are explicitly addressed.

In the generation of income account, compensation of employees is further broken down in order to reveal the role played by employers' social contributions on pensions and health care. In this way, the impact of for example rapidly rising pension benefits or health care costs on compensation of employees can be addressed.

In the secondary distribution of income account, all social contributions are broken down in order to show the various social contributions for pensions and health care, i.e. those paid by employers, by employees and by others. The columns show whether these contributions are social security contributions (paid to the government) or other social contributions (mostly paid to insurance companies). A major part of the social contributions for pensions are the pension supplements, i.e. the property income attributed to pension policy holders. The latter are also explicitly shown in the allocation of primary income account.

The pension benefits are explicitly shown in the secondary distribution of income account. The various types of final consumption expenditure on health care are shown in the use of disposable income account and in the overview on the supply and use of goods and services (table 6.9.4d).

#### *Supplementary tables on government finance and pensions*

These tables on the whole accounting system are supplemented with two tables. The first supplementary table (table 6.9.4e) focuses on government finance and shows the revenue, expenditure and net lending of the government. The table corresponds to a great extent with the table on government revenue and expenditure presented in section 6.5 (table 6.5d). However, there are several differences:

- The taxes and subsidies include also those of the EU. In this way, all taxes and subsidies relevant for the domestic production process are included. The EU-taxes are recorded as a revenue and are also recorded as an expenditure, i.e. a payment to the EU. In this way, net lending is not affected. For the EU-subsidies recorded as revenue also off-setting expenditure are recorded. The table therefore records the revenue and expenditure of the "collective sector", i.e. of the government plus the income flows of the national economy with the EU.
- The gross government expenditure are also redefined in two other respects: double counting by amount of the imputed employers' social contributions is eliminated and the net revenue from the disposal of other non-produced assets (e.g. land, UMTS) are recorded as revenue instead of as negative expenditure.

- The revenue and expenditure are re-grouped in order to facilitate analysis. Attention is more focused on taxes and social security contributions as the major source of financing government expenditure. All other revenue are treated as reductions of the gross expenditure. Furthermore, gross expenditure is split into three major categories: direct expenditure, transfers in cash and property income payable (interest). Finally, the transfers in cash (other than subsidies) are broken

Table 6.9.4a A module for policy analysis: current account

Current resources (R) and current uses (U)		Sectors				
		C	GG	HH	NE	RO W
I. Production account						
R	Output at basic prices (/Imports)	107 4	147	209	1430	430
	Taxes on products				90	
	minus Subsidies on products				-8	
U	Intermediate consumption (/Exports)	586	49	80	737	473
	Consumption of fixed capital	71	20	23	114	
	Value added basic pr./market pr.)	417	78	106	661	
II.1.1 Generation of income account						
R	Value added at basic prices (/market pr.)	417	78	106	661	
U	Compensation of employees	287	78	28	393	1
	wages & salaries	228	60	22	310	
	employers' social contributions	59	18	6	83	
	pensions	17	5	2	24	
	(health) care	9	3	1	13	
	other	33	10	3	46	
	Taxes on products				90	
	Other taxes on production	5	1	2	8	
	Subsidies on products				-8	
	Other subsidies on production	-5	-1	-1	-7	
	Operating surplus/mixed income	130	0	77	185	
II.1.2 Allocation of primary income account						
R	Operating surplus/mixed income	130	0	77	185	
	Compensation of employees			392	392	2
	Taxes on products		82		82	8
	Other taxes on production		8		8	0
	Property incomes receiveable	197	17	95	331	72
	interest	170	6	17	193	47
	correction for FISIM	-22			0	
	dividends (incl. withdrawal from quasi-corp.)	34	6	15	55	19
	reinvested earnings on direct foreign investment	15			15	6
	property income of insurance policy-holders	0	0	63	63	0
	pensions			49	49	0
	other			14	14	0
	rent on land and subsoil assets	0	5	0	5	
U	Subsidies on products		6		6	2
	Other subsidies on production		6		6	1
	Property incomes payable	239	38	40	317	86
	interest	115	38	39	192	48
	dividends	51			51	23
	reinvested earnings on direct foreign investment	6			6	15
	property income of insurance policy-holders	63			63	0
	pensions	49			49	0
	other	14			14	0
	rent on land and subsoil assets	4	0	1	5	
	Balance of primary incomes	88	57	524	669	

Table 6.9.4a A module for policy analysis: current account (continued)

Current resources (R) and current uses (U)		Sectors					
		C	GG	HH	NE	ROW	Total
II.2 Secondary distribution of income account							
R	Balance of primary incomes	88	57	524	669		
	Current transfers in cash receiveable	116	332	177	625	14	639
	social insurance contributions	84	127	1	212		212
	employers' social contributions	34	48	1	83		83
	actual employers' social contributions	24	39	0	63		63
	pensions	23	0	0	23		23
	(health) care	1	9	0	10		10
	other	0	30	0	30		30
	imputed employers' social contributions	10	9	1	20		20
	pensions	0	1	0	1		1
	(health) care	1	2	0	3		3
	other	9	6	1	16		16
	employees' social contributions	50	59	0	109		
	pension supplements for policy holder	49	0	0	49		49
	(health) care	1	25	0	26		
	other	0	34	0	34		
	social contributions by self-employed and others	0	20	0	20		20
	pensions	0	0	0	0		0
	(health) care	0	7	0	7		7
	other	0	13	0	13		13
	social insurance benefits in cash			126	126	2	128
	pensions			35	35		35
	other			91	91		91
	current taxes on income, wealth, etc.		95		95	0	95
	social assistance benefits in cash			22	22	0	22
	other current transfers n.e.c.	32	110	28	170	12	182
U	Current transfers in cash payable	114	217	300	631	8	639
	social insurance contributions	0		212	212		212
	actual	0		143	143		143
	imputed (incl. supplements)	0		69	69		69
	social insurance benefits in cash	48	79	1	128		128
	current taxes on income, wealth, etc.	34	0	59	93	2	95
	social assistance benefits in cash	0	22		22		22
	other current transfers n.e.c.	32	116	28	176	6	182
	Disposable income	90	172	401	663		
II.4 Use of disposable income account							
R	Disposable income	90	172	401	663		
	Correction for pension fund reserves	-37		37	0	0	0
U	Final consumption expenditure	0	179	384	563		563
	final cons. exp. by households			384			
	(health) care			15			
	financed via private (social) insurance			13			
	other			2			
	goods and other services			369			
	social security benefits via market producers		48				
	(health) care		45				
	goods and other services		3				
	social assistance benefits via market producers		8				
	(health) care		1				
	goods and other services		7				
	other non-market output		123				
	(health) care		1				
	goods and other services		122				
	Saving/Current account of ROW	53	-7	54	100	-45	55

Table 6.9.4b A module for policy analysis: Accumulation account

Changes in assets (A) and changes in liabilities (L)	Sectors					
	C	GG	HH	NE	ROW	Total
III.1. Capital account						
A Gross capital formation	97	22	50	169		169
minus Consumption of fixed capital	-71	-20	-23	-114		-114
Acquisition of other non-financ. assets	2	-4	2	0	0	0
Capital transfers payable	0	13	7	20	2	22
L Saving/Current account of ROW	53	-7	54	100	-45	55
Capital transfers receivable	4	10	3	17	5	22
Net borrowing	-29	8	-21	-42	42	0
III.2 Financial account						
A Net acquisition of financial assets	379	-34	92	437	246	683
L Net incurrence of liabilities	350	-26	71	395	288	683
Net lending	29	-8	21	42	-42	0
III.3 Other changes in assets account						
A Other changes in non-financial assets	17	11	134	162		
Other changes in financial assets	188	2	166	356	170	526
L Other changes in liabilities	463	2	-2	463	63	526
Net other changes in assets	-258	11	302	55	107	

Table 6.9.4c A module for policy analysis: balance sheets

Assets (A) and liabilities (L)	Sectors					
	C	GG	HH	NE	ROW	Total
IV.1 Opening balance sheet						
A Non-financial assets	1375	788	1926	4089		
Financial assets	3743	187	2053	5983	1433	7416
L Liabilities	4864	558	541	5963	1453	7416
Net worth	254	417	3438	4109	-20	
IV.2 Changes in balance sheet						
A Changes in non-financial assets	11	-13	163	161		
Changes in financial assets	567	-32	258	793	416	1209
L Changes in liabilities	813	-24	69	858	351	1209
Changes in net worth	-235	-21	352	96	65	
IV.3 Closing balance sheet						
A Non-financial assets	1386	775	2089	4250		
Financial assets	4310	155	2311	6776	1849	8625
L Liabilities	5677	534	610	6821	1804	8625
Net worth	19	396	3790	4205	45	

Table 6.9.4d A module for policy analysis: supply and use of goods and services

		Sectors					
		C	GG	HH	NE	ROW	Total
R	Output at basic prices	1074	147	209	1430		1430
	Imports					430	430
	Taxes on products				90		90
	minus Subsidies on products				-8		-8
U	Intermediate consumption	557	49	80	737		737
	Final consumption expenditure		179	384	563		563
	(health) care		47	15	62		62
	private insurance			13	13		13
	other final consumption by hh			2	2		2
	social security benefits via market producers		45		45		45
	social assistance benefits via market producers		1		1		1
	other non-market output		1		1		1
	goods and other services		132	369	501		501
	final consumption by hh			369	369		369
	social security benefits via market producers		3		3		3
	social assistance benefits via market producers		7		7		7
	other non-market output		122		122		122
	Gross capital formation	97	22	50	169		169
	Exports					473	473
	P.M. Total resources (= supply of products)						1942
	Total use (= use of products)						1942

Table 6.9.4e A module for policy analysis: Revenue and expenditure of the collective sector (EU &amp; government)

	2008 abs.
A. Taxes and social security contributions	
Taxes (including EU-taxes)	195
Social security contributions	118
health care	41
other	77
Taxes and social security contributions	313
B. Expenditure and net lending	
Direct expenditure	205
Compensation of employees	78
Intermediate consumption (incl. net taxes on pr.)	49
Gross capital formation	22
Social benefits in kind via market producers	56
health care	46
other	10
Transfers in cash	130
Subsidies (including subsidies by the EU)	15
Other transfers in cash to corporations	3
Other transfers in cash to households	94
Other transfers in cash to the rest of the world	18
Property income payable	38
Total gross expenditure	373
Non-tax/premium revenue	52
Actual market output	23
Property income receiveable	17
Other revenue (minus)	12
Total net expenditure	321
Net lending	-8

Table 6.9.4f A module for policy analysis: Revenue and expenditure of pensions schemes

	2008 abs.
<b>A. Resources</b>	
Contributions to pension schemes (gross)	77
charges for insurance services	5
actual contributions to pension schemes	23
property income of pension policy holders	49
Other income and capital transfers (net)	0
<b>Total revenue</b>	<b>77</b>
<b>B. Expenditure and change in net equity</b>	
Output (/operating expenses)	5
Pension benefits	35
<b>Total expenditure</b>	<b>40</b>
Change in net equity of households in pension fund reserves	37
<b>C. Balance sheet</b>	
Net equity at begin	817
Change in net equity due to revenue and expenditure	37
Other changes in assets (holding gains/losses)	1
<b>Net equity at end</b>	<b>855</b>



down by sector of destination (corporations, households, rest of the world). In this way, the interaction between government finance and the national economy is made explicit.

The second supplementary table (table 6.9.4f) presents the revenue, expenditure and balance sheet for pension schemes. The balancing item of the revenue and expenditure is the change in net equity of households in pension fund reserves. The overview of the revenue and expenditure for pension schemes complies with the resources and uses in the standard national accounts. However, the double-counting in these resources and uses by amount of property income of pension policy holders has been avoided.

The satellite could be supplemented with the macro-economic overview table presented in section 6.2 (table 6.2f).

#### *Value added of the satellite*

The major merits of this satellite are:

- It is a relatively simple three sector accounting model that shows all major macro-economic aggregates and identities according to the most recent international standards.
- It focuses on government finance, pensions and health care. It shows in accounting terms their links with the rest of the national economy. These links are not well elaborated in the standard national accounts, e.g. the impact of rising costs of health care on government finance and labour costs.
- In designing and describing a policy-oriented model of the national economy often insufficient attention is paid to the underlying accounting principles. As a consequence, identities are overlooked or presented in a chaotic way. The accounting approach can clarify which identities are needed and can present them in a systematic and accessible way.

### **6.9.5 Summary**

National accounts satellites serve data needs by modifying, supplementing or rearranging basic national accounting concepts. In this way, the scope, content and detail of the statistical information can be focused on serving the specific data need while retaining the merits of the standard national accounts.

Three satellites have been presented. The satellite on social policy shows the size, development and composition of social expenditure by type of social risk or need. It can be obtained by simply rearranging the standard national accounting concepts. A similar satellite can also be made to establish straightforward links between international social protection statistics and the national accounts.

The human capital satellite shows the role of human capital, i.e. expenditure and training, in the national economy. This amounts to fundamental changes in basic national accounting concepts (value added, capital formation). The satellite shows that introducing such changes may be rather complicated and require substantial expert knowledge on national accounting.

Models for policy analysis and forecasting employ basic national accounting concepts and identities but have their own distinct focus. The satellite for policy analysis gives an example of an explicit accounting framework underlying such models. Such an accounting approach can clarify and simplify the various identities and relationships in these models. The satellite itself clarifies the differences between a really policy oriented approach and the accounting system of the universal model. Emphasis is put on policy issues like government finance, pensions and health care and their interactions with macro-economic developments.

## 6.10 Summary

### 6.10.1 The new world standard as a model

The sections 6.2-6.9 have described and discussed the standard national accounts from eight different perspectives. This section draws conclusions about the standard national accounts as a model.

In section 6.1, five views on the standard national accounts as a model were distinguished:

1. as a model of the real world;
2. as a model as such;
3. as a model in view of economic theory;
4. as a model in view of administrative concepts;
5. as a model for various types of economic analysis, policy and decision-making.

#### *Model of the real world*

The standard national accounts are clearly a model of the real world. They do not provide a complete picture of the national economy but a selective view. Major economic items excluded are unpaid household services, volunteer services, leisure time and tax expenditure. This reflects that the standard national accounts focus on the part of the national economy that can be readily measured in monetary terms.

Nevertheless, even in describing this 'measurable' selection of the national economy the standard national accounts contain many transformations of the flows and stocks as they occur or can be measured directly. Types of transformation included are:

- grouping/aggregating/omitting, e.g. most economic relationships within corporations;
- imputing, e.g. services of owner-occupied dwellings or retained earnings on direct foreign investment;
- translating flows in kind into monetary terms, e.g. income in kind;
- translating cash flows into flows on a transactions basis, e.g. tax receipts;
- recording one flow twice or even more times, e.g. most of the production costs of government;
- netting, e.g. gross fixed capital formation is the net result of the purchase and sale of fixed assets;
- partitioning, e.g. insurance premiums;
- re-routing, e.g. employers' social contribution paid directly by employers to social insurance funds;
- translation of nominal values into prices, volumes and real values, e.g. economic growth, productivity change or Domestic Product per capita corrected for differences in purchasing power.

These transformations translate the complex and very heterogeneous economic reality in a meaningful and comprehensible description of the national economy. This is a major merit of the standard national accounts and it is essential for the relevance of national accounts statistics.

The standard national accounts as a model of the real world is built on many choices (conventions) on how to label flows, stocks and the actors of the national economy. This applies e.g. to standard national accounts concepts of output (e.g. compensation of employees is not output produced by the employee but primary income), capital formation (e.g. the purchase of software is capital formation and not intermediate consumption), income (e.g. national income excludes holding gains), government (e.g. excluding the Central Bank) and prices and volumes (e.g. quality-change should be regarded as a volume-change). Different choices would have resulted in a different picture of the real world.

*Model as such*

The second view on the standard national accounts is that as a model as such. From this point of view it can be characterised as an accounting model, as it is based on systematically exploiting accounting identities and logic and does not contain any behavioural relationships.

The standard national accounts are a mix of general principles, some big conventions and numerous specific definitions. These conventions and specific definitions are essential for translating the complex economic reality and its many specific institutions, actors, flows and stocks into a comprehensive measurement model of the national economy.

Furthermore, the standard national accounts can also be characterised as a multi-purpose model, as there is no single dominant perspective on the national economy. It should be regarded as a consistent compromise of eight different models. Each model reflects a different perspective on the national economy (the national economy as a whole, non-financial corporations, financial corporations, the government, households, relations with the Rest of the World, industries and other).

Several of the big conventions and specific definitions can only be well-understood in view of one of these perspectives. Examples are the splitting of gross casualty insurance premiums into a service charge and a net casualty insurance premium, the recording of shares as liabilities of corporations or the registration of the central bank outside the sector government.

*Model in view of economic theory*

The standard national accounts is in several respects an economic model, e.g. the distinction between financial and non-financial transactions, the distinction between taxes and the purchase of services and the preference for market values. Furthermore, the standard national accounts include some specific theoretical elements, e.g. the notion of price discrimination is applied for distinguishing prices and volumes, interest is recorded on zero-coupon bonds and net discounted value is used as a supplementary principle of valuation.

However, the standard national accounts are also in major respects fundamentally different from economic theory. They generally prefer the current exchange value to the net present value, do not show primary income as a reward for some specific factors of production and do not record expenditure on education and training as capital formation. Furthermore, the standard national accounts are much more specific in its concepts, e.g. what is capital formation, what is economic growth and what is real income? In economic theory concepts are often defined in a more general way. Problems in obtaining concepts measurable in monetary terms are generally abstracted from.

The standard national accounts' description of the national economy is closer in spirit to some economic theories (e.g. Keynesian theory, monetary analysis, input-output analysis) than to others (e.g. welfare economics and micro-economic theory on household production).

The standard national accounts can be regarded as a child of the Keynesian revolution. The introduction of a sector government, the distinction between public and private corporations and the concept of household consumption expenditure included consumer durables reflect this. The standard national accounts also seems to meet the general needs for monetary and port-folio analysis, e.g. the sector financial corporations and its subsectors, the accumulation accounts and balance sheets and the systematic links to the real part of the national economy and rest of the World. Furthermore, the standard national accounts reflects a clear meso-economic approach to the national economy and in particular to the production process.

The standard national accounts is clearly at odds with welfare economics, as it does not aim to include extended concepts of income and wealth. Similarly, fundamental differences exist with human capital theory and micro-economic theories on household income and

production. The standard national accounts ignores unpaid household services, does not regard the purchase of education and consumer durables as investment, does not regard employees as producers of services and pays limited attention to the total supply of labour.

These biases in the standard national accounts seem to reflect the focus on staying relatively close to what can readily be observed in monetary terms, i.e. to measure what can best be measured in monetary terms. This can be regarded as a conservative bias, as it reflects to a great extent administrative realities. However, for a framework for compiling regularly statistics, this is a very natural and evident bias. Nevertheless, data users should be aware of the implications of this bias, e.g. that national income is no measure of welfare.

#### *Model in view administrative concepts*

The standard national accounts has much in common with administrative data, like business accounts and government accounts, e.g. the presentation in terms of accounts, the use of double-entry bookkeeping, the terminology and the focus on what can be readily measured in monetary terms. Nevertheless, there are also four important differences:

- The national accounts are much more standardised nationally, internationally and over time.
- The national accounts distinguish many more accounts and balancing items.
- The central concepts of the standard national accounts, like value added and disposable income, are rather different from the central concepts in the business accounts and government accounts.
- The concepts in the national accounts differ substantially with respect to delimitation, valuation and time of recording.

These differences reflect to a great extent two differences in purposes. The first difference pertains to the need to standardisation. Standardisation of the national accounting concepts is essential for obtaining meaningful and comparable totals. Standardisation of the business accounts and government accounts is less essential.

The second difference is that the purpose of the national accounts is to describe corporations and government units as part of a consistent description of the national economy; this is no purpose of the business accounts and the government accounts.

#### *Model for analysis and policy*

The fourth view on the standard national accounts is that as a model for various types of economic analyses, policy and private decision-making. From this instrumental point of view, the major merits of the standard national accounts are:

- Multi-purpose;
- Based on a set of established concepts inspired by economic principles and economic reality;
- Relatively close to what can be readily observed in monetary terms;
- Relatively close to administrative realities;
- Harmonised with concepts in statistics;
- Based on rigorous accounting logic;
- Internationally standardised.

The standard national accounts are in general well designed and well founded. The standard national accounts contain systematic biases. However, these biases merely reflect the natural focus of a regular statistic, i.e. a focus on what can be readily measured. This applies e.g. to unpaid household services and tax expenditures. Including such more analytic elements generally increases the relevance of the standard national accounts for one specific purpose, while reducing it for most other purposes. Such concepts with substantial negative external effects for other purposes should therefore not be included in the basic concepts.

### 6.10.2 Proposals for the next SNA

In this chapter, three types of changes of the current universal model (SNA93) have been proposed:

1. Changes in basic concepts;
2. Changes in presentation;
3. Supplementary standard tables and concepts.

All these changes should increase the utility of the universal model as defined in section 6.1.

#### *Changes in basic concepts*

The major changes in basic concepts proposed are:

1. Sector-classification: The central bank should become part of the sector general government, as it does not concern a market producer (see section 6.3). The value of its output should be recorded like that of all other non-market producers.
2. Valuation of other non-market output: This should include a net operating surplus by amount of an opportunity interest on the capital invested. This gives a much higher and better picture of the value and value added of government output (and other non-market output in general) (see section 6.3).
3. Capital formation: Expenditure on military weaponry should be recorded as capital formation and be written-down in accordance with the general national accounting rules for calculating consumption of fixed capital. This reflects that producing defence services is not fundamentally different from any other production process and that its capital inputs should therefore be treated in line with the general accounting principles (see section 6.3).
4. Capital formation: Expenditure on Research and Development should be recorded as capital formation and be written-down in accordance with the general national accounting rules for calculating consumption of fixed capital. The existence of international and well-established statistics on R&D ensures that this is not unrealistic in terms of extra demands on data compilation. Furthermore, by recording expenditure on R&D as capital formation the links between the national accounts and these statistics important for economic policy are clarified. This may reveal imperfections and inconsistencies and can induce improvements of the data (see section 6.2).
5. Capital formation and final consumption expenditure by households: The purchase of consumer durables by households should be recorded as capital formation instead of as final consumption expenditure. Imputed services of owner-used consumer durables should be recorded by amount of its consumption of fixed capital plus an opportunity interest on the capital invested. These imputed services are consumed as part of the final consumption expenditure of households (see section 6.6).

Several of these changes bring the national accounting concepts more in line with economic theoretic insights, e.g. net operating surplus on other non-market output should include at least an opportunity interest on the capital invested or consumer durables and R&D are non-financial assets (criterion: relevance from an economic theoretical point of view). Furthermore, many of these changes also amount to a more straightforward application of basic principles, e.g. recording the central bank also as a non-market producer and recording all purchases of durables like cars as capital formation. In this way, the logic of the central accounting framework becomes easier to grasp (criterion: accessibility). Finally, negative consequences for other criterions, like relevance from an administrative point of view or measurability, are negligible. As a consequence, these changes increase the utility of the universal model.

### *Changes in presentation*

The major changes in presentation proposed are:

1. Key-ratios should be presented as a major output of national accounts, e.g. productivity figures, Domestic Product per capita, government deficit (net lending) as a percentage of National Income.
2. The distinction between actual and imputed flows should play a much more important role in presenting national accounts statistics. This reveals underlying logic and can reduce misuse.
3. The terminology should be modified in various instances, e.g. less lengthy.
4. The links between the input-output tables and the sector accounts should be further clarified, e.g. the supply table could be supplemented with a small matrix showing output by industry and by institutional sector.
5. The input-output tables should also be used as a format for presenting an overview of price changes or volume changes.
6. The number of accounts distinguished in the sector accounts should be more limited. Accounts should only be used to distinguish major economic processes and not to derive balancing items of secondary importance like entrepreneurial income. Excessive number of accounts limits the accessibility of national accounts statistics. Furthermore, meaningful alternative balancing items are generally better be derived by disregarding the general accounting structure.
7. The national accounts should be presented for each of its major perspectives. This includes overview tables with key-ratios, price- en volume changes and real values. This shows also that price – and volume-changes are not only meaningful for the input-output tables but also for the sector-accounts.
8. The national accounts presented should allow flexible use, e.g. by showing sufficient relevant detail like wage subsidies. Such concepts important for major specific data needs should be stressed.

In terms of the ten criteria for the universal model, most of these changes in presentation are focused on increasing the user-friendliness and accessibility of the universal model and national accounts statistics. The emphasis on a more systematic distinction between imputed and actual flows is relevant from an economic theoretic point of view. Negative consequences from the point of view of the other criteria seem absent. As a consequence, these changes in presentation should also be regarded as increases in the utility of the universal model.

### *Supplementary concepts*

The major supplementary concepts proposed are:

1. For all domestic sectors: real change in net worth;
2. For financial and non-financial corporations: entrepreneurial income before and after tax;
3. For financial and non-financial corporations: net worth to the owners, i.e. the net worth corrected for shares and equity as a liability;
4. For households: disposable income in cash, final consumption expenditure in cash, revenue and expenditure.
5. For government in the SNA93: government expenditure and revenue. In Europe, after the drafting of ESA95, government expenditure and revenue have been defined officially. These definitions can be improved in various ways (see section 6.5.2):
  - a. Double-counting can be reduced by excluding the imputed employers' social contributions.
  - b. Interest payments and receipts should be netted for the holding gains and losses on loans in nominal terms.

- c. The net sale of non-produced assets should be recorded as revenue instead of as a negative expenditure.
- 6. For government: price and volume-change for all types of expenditure; this implies amongst others that price- and volume changes should also be defined and distinguished for social security and social assistance benefits in cash.

In terms of the ten criteria for the universal model, a common feature of the standard supplementary tables is that the consistency of the central framework is not affected, while the relevance and accessibility for specific purposes is substantially increased. By extending the scope of price- and volume changes with social benefits also the usefulness as an analytical tool is increased. The negative effects for the other criteria, e.g. measurability or cost-efficiency, are negligible.

#### *Further harmonization with statistics in specific areas*

The next SNA should also have much clearer links to the major statistics in specific areas. Cases in point are the R&D statistics (OECD-Frascati-Manual), education statistics (OECD-Education at a glance) and social protection statistics (Eurostat-ESSPROSS; OECD-SOCX). Preferably the central tables of these major statistics are incorporated in the next SNA. Similarly, the major overview tables on the government in the next SNA should correspond with those in the next IMF-manual on government finance statistics.

In terms of the ten criteria for the universal model, further harmonization with other statistics will increase the relevance of the national accounts as a general overview and is likely to also improve measurability and cost-efficiency. Negative trade-offs with other criteria could occur when the harmonization is achieved by overburdening the central framework with specific detail or changes in concepts which are only useful from the perspective of these specific areas. However, harmonization can often be achieved by using the flexible set of basic national accounting concepts for redefining the specific purpose-concepts<sup>95</sup> and by the introduction of tables showing the transition from the national accounts concepts towards the specific-purpose concepts.

#### *Different views on the ideal accounting system*

In chapter 3, some different views on the design of the ideal accounting system have been briefly discussed. Our description and discussion of the universal model reflects also a view on the ideal accounting system. This view can be clarified by a comparison with three alternative views (see scheme 6.10).

The first view is the one preferred by Ohlsson for empirical work. According to him, different accounting frameworks are needed for different purposes.

The second view is the one expressed in the new international guidelines: the core accounting framework should be multi-purpose, encompassing and flexible with respect to a whole series of detailed classifications; for specific purposes this framework can be supplemented with some satellites.

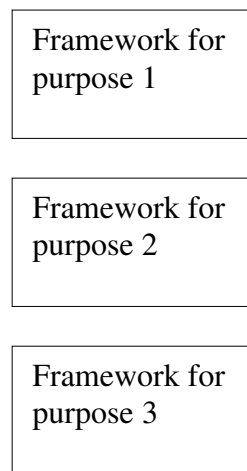
The third view can be dubbed the Dutch view: the core accounting framework should be multi-purpose but rather general, “small”, without too much specific detail and with a very limited set of analytical elements. This core should be supplemented with a wide range of satellites serving specific purposes; these satellites will often contain much more analytical elements.

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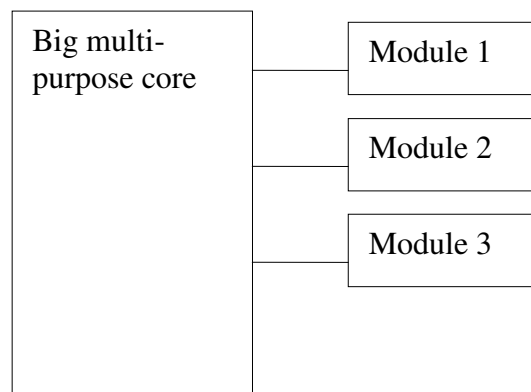
<sup>95</sup> For example, in R&D statistics granting loans should not be regarded as a type of expenditure, but as a separate financial transaction.

Scheme 6.10 Four views on the ideal accounting framework

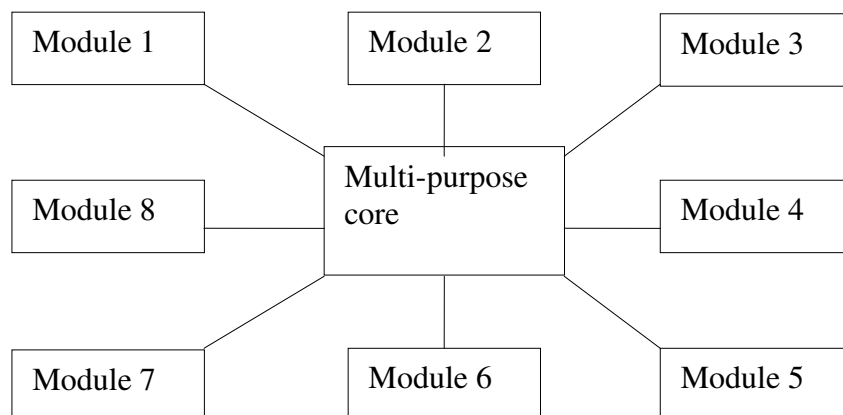
View 1: Different accounting frameworks for different purposes (Ohlsson)



View 2: A big multi-purpose core and some modules (general view of the SNA93)



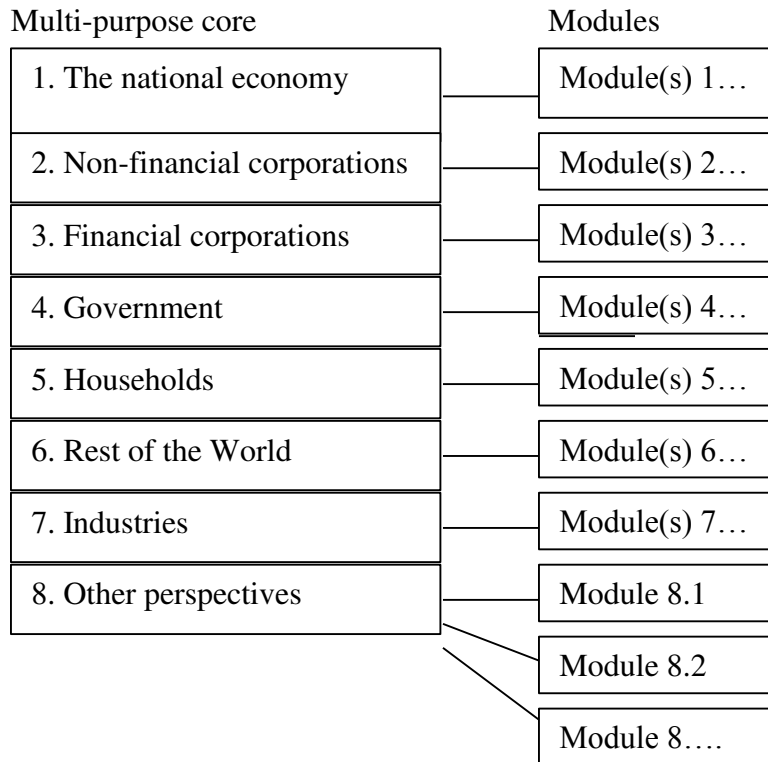
View 3: A smaller multi-purpose core and many modules (Dutch view)





## Scheme 6.7 (continued)

View 4: A smaller multi-purpose core with eight perspectives, many modules directly linked to these perspectives and some of these modules derived by simply rearranging basic concepts (my view)



Our view on the ideal accounting system can be summarised as:

- A system with a multi-purpose core and specific purpose-satellites;
- The core is a mix of eight different perspectives. These different perspectives are best served by specific satellites. The core itself should be straightforward in its logic and major choices and should not contain a detailed accounting framework. However, the classifications should be sufficiently detailed to allow rearrangement for specific purposes.
- In contrast to the Dutch view, minimising the number of analytical elements is not an important aim as such for the core: these analytical elements should be judged on their merits and negative external effects for the various data needs and in view of the various data possibilities.
- In contrast to the view of Richard and Nancy Ruggles and general statements about the Dutch view (see section 3.4), the core should not be micro-oriented. A fully micro-oriented core can only address in a very indirect way the major data needs served by the national accounts and is in several respects problematic. Standard micro-economic concepts are hard to define in a satisfactory multi-purpose way (on household income see e.g. Smeeding and Weinberg, 2001) and will be affected by changes in the underlying administrative concepts. Furthermore, the micro-oriented core data base will have very complicated links

with the major standard national accounting aggregates like Domestic Product and Saving, conceptually as well as numerically. The micro-economic promise of flexibility will therefore turn out to be an illusion.

- For each of the major perspectives separate satellites should be drawn up. The satellites can clarify and overcome the conceptual limitations of the core-system. Ohlsson was right that for many different purposes different concepts are needed. These different needs can not be reconciled in one consistent accounting framework.
- The satellites can offer two types of conceptual solutions. Firstly, by rearranging basic concepts alternative supplementary concepts can be constructed. This is the simplest and least data demanding solution. Secondly, more fundamentally different concepts are introduced, e.g. micro-oriented concepts. To this end, for all differences with the standard national accounting concepts separate estimates are to be made, e.g. for the difference between capital consumption in the national accounts and in the business accounts.
- The satellites could also supplement the core-system in terms of detail and scope, e.g. with data in non-monetary terms.
- The satellites should ensure that data users can select a national accounts data set that is focused on their data needs and are not bothered by detail and concepts meaningful for other purposes.

### **6.10.3 Update in view of the new draft guidelines (SNA08 and ESA09)**

At present, a new set of guidelines (SNA08 and ESA09) is being written. To what extent have my proposals for the next SNA and ESA been incorporated in these new guidelines?

With respect to the major changes in basic concepts proposed:

- Recording the output of a central bank as other non-market output and therefore regarding the central bank as a non-market producer has been adopted. However, the consequence to record the central bank in the sector government is not taken; the central bank is still regarded as part of the financial corporations.
- Valuing other non-market output including an opportunity interest on the capital invested was not adopted.
- Recording expenditure on military weaponry as capital formation was adopted.
- Recording expenditure on Research and Developments as capital formation was adopted. However, in Europe, this new convention will only be applied after it has been investigated and verified that this is feasible for all European countries.
- Recording the purchase of consumer durables by households as capital formation instead of final consumption was not adopted.

In terms of presentation and supplementary concepts, not much seemed to have changed. However, by adding several new chapters, the focus has been shifted substantially toward a much better link with the major uses of national accounts. The current guidelines focused on merely presenting a basic national accounts framework in terms of sector accounts and input-output tables. By adding these new chapters, also a link is established with the major uses of national accounts, e.g. for public finance, monetary policy and analysis of economic growth and productivity. This is fully in line with the eight perspectives and our view on the ideal system of national accounts (see tables 10.6.3a and 10.6.3b).

**Table 6.10a Eight major perspectives and the chapters on applications and extensions in SNA08 (volume II)**

Eight major perspectives	Chapters in volume II of SNA08
1. National economy	18. Elaborating the accounts 20. Capital services and the national accounts 25. Informal aspects of the economy
2. Non-financial corporations	21. Measuring corporate activity
3. Financial corporations	27. Links to monetary and financial statistics
4. Government	22. The general government and public sectors
5. Households	24. The households sector
6. Rest of the World	26. The rest of the world accounts
7. Industries	28. Input-output and other matrix based analysis
8. Other perspectives	23. Non-profit institutions in the SNA 29. Satellite accounts and other extensions

**Table 6.10b Eight major perspectives and the chapters on applications and extensions in ESA09**

Eight major perspectives	Chapters on applications and extensions in ESA09
1. National economy	12. Quarterly accounts
2. Non-financial corporations	21. Link between business accounts and national accounts
3. Financial corporations	16. Insurance and social insurances other than pensions 17. Pensions
4. Government	20. Government accounts
5. Households	
6. Rest of the World	18. Rest of the world accounts
7. Industries	9. Supply and use tables and input-output framework
8. Other perspectives	13. Regional accounts 19. European accounts 22. Satellite accounts



## 7. THE NATIONAL MEASUREMENT PROCESS

### *Universal standards and national practice*

#### 7.1 Introduction

In this chapter, the national measurement process is described and discussed. For non-national accountants, the compilation of national accounts statistics is usually a mystic and incomprehensible process. Section 7.2 and 7.3 provide therefore a look behind the scenes.

Section 7.2 is devoted to the role of the national operational models, i.e. the national operational versions of the universal accounting model. The national operational model decides what is actually to be estimated. Furthermore, differences between national operational models affect the international comparability of national accounts statistics.

Section 7.3 explains the compilation process. It describes the roles played by data, the three compilation tools (accounting identities, assumptions and plausibility checks) and environmental factors (skills, resources and policy). In this way, the logic underlying the compilation process is revealed. Furthermore, it completes the description of the relationship between national accounts statistics and the real world.

The reliability of national accounts statistics is a major outcome of the compilation process. For data users, it is important to know how reliable official national accounts statistics are in absolute terms and in comparison to other data sources. This is the topic of section 7.4. A summary is provided by section 7.5.

The literature on national accounts compilation methods and the reliability of national accounts statistics is very limited<sup>96</sup>. The value added of this chapter in view of current literature is therefore manifold:

- It demonstrates the importance of the operational model;
- It provides a systematic account of the various steps in compiling national accounts statistics;
- It clarifies the role of accounting identities, assumptions and plausibility checks.
- It discusses the role of environmental factors like skills, resources and policy.
- It puts the issue of the reliability of national accounts statistics in a general context, stresses the importance of sensitivity analysis and downplays the importance of indicators for margins of error.

#### 7.2 The operational model

The universal model can not be estimated directly. It should first be translated into an operational model for a specific country at a specific moment in time. The specification of the operational model involves four steps:

1. Specification of the desired scope and detail;
2. Interpretation of the universal concepts;
3. Specification of the universal concepts;
4. Application to the national economy for a specific period.

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<sup>96</sup> On compilation methods see in particular Sérurier (1996; on compiling national accounts in general), Bos and Gorter (1993; on the Dutch estimates of GNP), Takema (2000; on compiling input-output tables) and UN (2000; on the link between business accounts and national accounts). On the reliability of national accounts statistics, see section 4.2 and Novak (1975), Weale (1988), Wroe et al (1998 and Young (1987).

### *Step 1: Specification of scope and detail*

The first step in the specification of the operational model is the specification of the scope and detail of the national accounts statistic. The universal model is very encompassing. The specification of the scope therefore generally involves the selection of parts of the universal model, e.g. a simple set of sector accounts excluding balance sheets and other changes in assets accounts. The universal model contains also a lot of detail, e.g. detail at very levels of aggregation in the classification by industry and the classification of flows and stocks. Due to trade-offs, scope and detail generally also depend on the frequency and timeliness of the national accounts statistics, e.g. a trade-off between detail and timeliness. The desired detail can also depend on national demands for specific detail, the available detail in national data sources or on requirements of reliability, e.g. price measurement is influenced by the level of desegregation used. Differences in level of desegregation can therefore also influence the reliability and comparability of national accounts statistics.

### *Step 2: Interpretation of the universal concepts*

The second step in the specification of the operational model is the interpretation of the universal concepts. This step is in fact an intermediary step, i.e. intermediary in the further specification and application of the universal concepts. Interpretation of the universal concepts is not always simple and straightforward. Concepts can be formulated in vague or even misleading terms; literal reading of the definitions of these concepts can then lead astray. Furthermore, related concepts can also be defined in different and sometimes contradictory terminology. Finally, the definitions of some concepts may even conflict with the general accounting principles. Two examples can illustrate such problems of interpretation.

The first example pertains to the *services of owner-occupied dwellings*. Does this also include imputing services and income for free standing garages and holidays homes abroad? According to the general accounting logic, such imputations should indeed be made. However, the old guidelines and the SNA93 are not explicit about this and created thus differences in interpretation. The ESA95 contains therefore some explicit statements that such imputations should indeed be made.

The second example pertains to *valuables*. The general definition of valuables is “valuables are non-financial goods that are ... acquired and held primarily as stores of value”. Furthermore, changes in inventories are defined to include goods for resale. Literally following these definitions, the acquisition and disposal of paintings by art dealers should be recorded as changes in inventories, while the acquisition and disposal of paintings by households should be recorded as net acquisitions of valuables. This interpretation was not intended in drafting the SNA93. The ESA95 therefore includes a supplementary convention treating also the purchases and sales of the art dealers as net acquisitions of valuables (ESA95, para 3.126).

### *Step 3: Further specification of the universal concepts*

The third step in the specification of the operational model is the further specification of the universal concepts at a national level. This step is required for universal concepts defined in too general terms. Four examples may illustrate this: volumes and prices, market and other non-market producers, financial derivatives and the subsectors of the general government.

In the standard national accounts, the *volumes and prices of the supply and use of goods and services* are defined in a not very specific way. Some examples may illustrate this:

- the volume of banking and insurance services is not at all defined;
- the volume of education services may be measured in terms of outputs (e.g. the number of pupils) but also in terms of inputs (e.g. the number of teachers);

- the quality change of computers may be measured by a hedonic method but also by alternative methods.
- Fisher-indices are preferred but Laspeyres- and Paasche indices are acceptable (in combination with chain linking).
- No clear guidelines are given about how to incorporate new products into price-indices.

Operational definitions of prices, volumes, economic growth, productivity and real income differ therefore substantially all over the world. The direct consequence is that the national accounts statistics on these major variables are not very comparable. This has induced the European Union to start a programme for drastically improving the comparability of the European economic growth figures (see section 4.3). Furthermore, without any information on the operational definitions employed, data users may have a wrong impression about what is actually being measured.

The *distinction between market and other non-market producers* is in two respects very important in the national accounts. Firstly, it determines the delimitation of the sectors government and non-profit institutions serving households vis-à-vis the other sectors. It therefore also determine the delimitation of government revenue, expenditure and deficit. Secondly, it determines the valuation of output and therefore value added and Domestic Product. In the current universal guidelines (SNA93), this important distinction is couched in vague and partly misleading definitions<sup>97</sup>. In the current European guidelines (ESA95), this distinction is much more and better defined. For example, by introducing a 50% criterion it is decided that non-profit institutions with sales normally less than half of their production costs should be treated as other non-market producers; the other non-profit institutions should be regarded as market producers. However, this further specification is not acknowledged as a universal convention. As a consequence, operational definitions of the sector government may differ substantially among non-European countries and between European countries and non-European countries. Different notions of the sector government and different principles of valuation are then underlying the official national accounts statistics.

The previous set of international guidelines was not explicit about the recording of financial derivatives, like deep-discounted bonds. In the new guidelines, the recording of these new financial instruments is explicitly described.

The SNA93 allows two types of sub-sectoring of the general government: the social security funds may be recorded as a separate sub-sector or can be recorded as part of the central government.

These examples illustrate that universal concepts can be defined in too general terms for many different reasons. Prices and volumes are still defined in rather general terms, because no agreement could yet be reached on some of the general principles. Market and other non-market producers are defined in general terms in the SNA93, equally because no agreement could be reached about one specific definition or because such a definition was not deemed to be necessary or wanted. The recording of financial derivatives was not defined in the old guidelines because they are a relatively new phenomenon. The two types of sub-sectoring of the general government reflect a philosophy of flexibility: for some purposes/countries one treatment can be preferred and for others the alternative is more meaningful.

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<sup>97</sup> An economist reading the definition of market output in SNA93 may even think that the distinction between market output and other non-market output has a relationship with price-elasticity's: "market output is output that is sold at prices that are economically significant... Prices are said to be economically significant when they have a significant influence on the amounts the producers are willing to supply and on the amounts purchasers wish to buy (SNA93, paragraph 6.45, p. 128). However, this would be clearly a non-sense and unintended definition. Addictive products like tobacco and alcohol have generally very low price elasticity. However, they should not be regarded as other non-market output like defence and general public services.

*Step 4: Application to the national economy for a specific period*

The fourth step is the application of the universal model to the national economy and its institutional arrangements for a specific period. For example, for compiling Dutch national accounts figures on 2000, it should be investigated and decided, e.g.:

- which establishments, corporations and institutions exist in the Netherlands in 2000 and what is their industry and sector;
- what revenues from the Dutch central and local government are taxes and what are sales by the general government;
- what payments by employers are social insurance contributions and what are wages.

The universal model is also flexible in view of specific economic circumstances, e.g. in case of hyper-inflation inflation accounting is recommended.

The application of the universal model is not straightforward. It requires knowledge and interpretation of the guidelines, knowledge and interpretation of the specific situation to be described, a judgement on what is feasible and efficient from a data compilation point of view and a judgement on what is relevant for data users.

Application of the universal model may in practice involve some clear and deliberate *deviations from the universal model*. A common deviation pertains to the statistical unit employed. In the universal model industries are defined in terms of establishments and not in terms of institutional units. However, in most countries, even in Europe, data on industries are actually based on institutional units. This is even explicit in the European regulation on manufacturing statistics: this regulation refers only to institutional units. The consequence of this common deviation is that the output and production processes of industries measured by national accounts statistics is much more heterogeneous and incomparable than suggested by the universal model.

For example, the output of shoe-producers recorded in the national accounts statistics as part of the industry manufacturing may also include retail-activities organised and administered completely separately from the shoe-producing activities. Similarly, the output, wages and employment of public administration in the national accounts statistics may also include those of units of the state government, provinces and municipalities with respect to garbage disposal, cultural services (e.g. museums and libraries), social services, health care services (e.g. preventive health care like vaccinations and health surveys) and manufacturing by workplaces for disabled people.

In the Netherlands, the revision of the national accounts in 1998 (see Buiten et al, 1999) amounted to a increase of 10% of the size of the sector general government. This increase was mainly due to a more strict adherence to the international guidelines; it was only too very limited extent caused by changes in the international concepts.

Application of the universal model may also be *affected by non-statistical uses of the operational model*. For example, in Germany the classification of individual companies by industry in the statistical business register is also used to decide which collective wage-agreement is relevant for a company. Therefore, there may be a tendency to incorporate changes only with some delays or not at all. Similarly, in some countries the industry defence should for political reasons reflect the responsibilities of the Ministry of Defence. When the Ministry of Defence owns, supervises and exploits machine producing plants, these are therefore included in the national accounts statistics on the industry defence.

These four steps demonstrate that the operational model can have a big impact on what is actually measured by official national accounts statistics. Differences in operational models can also substantially affect the international comparability of official national accounts statistics.



When compiling national accounts statistics for the first time or when implementing new universal concepts, defining the operational model involves a lot of work. When compiling national accounts figures annually, annual updating of the operational model is required. For example, companies can merge, change their major product (e.g. from mining to chemical products or from forestry to environmental protection) or go bankrupt and the government can deregulate or privatise its tasks, start special employment projects or reorganise social security. Without updating and an excellent communication of the updates, the national accounts figures will not be able to describe these developments.

### 7.3 The compilation process

#### *Major characteristics*

The major characteristics of the data, the compilation process and environmental factors can be summarised as follows.

The *available data are very heterogeneous* in all respects, e.g. scope, concepts, detail, reliability, time of availability and frequency. The available data will always be incomplete in terms of scope and detail. As a consequence, many estimates can not directly be based on the available data. For reliable estimates a good frame of reference, e.g. a business register, is essential. The frame of reference helps in completing and combining surveys and administrative data, in updating former estimates and in making estimates for parts of the economy on which hardly any information is available.

The compilation process is based on three estimation tools:

- accounting identities;
- assumptions for completing;
- plausibility checks.

Compiling national accounts statistics amounts to exploiting as best as possible the many *accounting identities*. Examples are: supply is equal to demand (both in current and constant prices), the three basic ways to estimate GDP, taxes paid should be equal to taxes received and the changes in stocks are equal to the sum of the flows. Accounting identities are friends and foes of national accounts statistics. They ensure consistency, can act as plausibility check and allow residual estimates. However, they can also enforce to modify best estimates for the sake of consistency. Furthermore, all residual estimates are likely to be very unreliable, as they serve as the garbage bag for errors in all the other estimates.

*Assumptions* are essential in combining and completing the basic set of data. Many types of assumptions are used, e.g.:

- grossing up of a survey on the basis of a frame of reference;
- the use of strong institutional, technical or economic relationships;
- the use of fixed ratios, transition schemes and life times;
- the use of specific conventions, e.g. the productivity increase of government output is 0,5% per year;
- assumptions based on fragmentary qualitative information, expert opinions, historical trends and ratios, analogies and anecdotes.

The more encompassing, up-to-date, detailed, reliable and conceptually close the basic data set, the smaller the role played by assumptions can be. Plausible assumptions can remedy to a substantial extent the absence of data and are to be preferred to implausible data. However, when for substantial parts of the national economy no plausible data or assumptions are available, national accounts statistics transform into guesswork.

*Plausibility checks* are very important for the reliability of national accounts statistics. Three types of plausibility checks can be distinguished:

- comparison of different data/estimates;
- investigation of all ‘strange’ developments and ratios (numerically, conceptually, institutionally, economically) by looking for a plausible explanation;
- investigation of the data on the presence of expected developments; in case of absence look for a plausible explanation.

Plausibility checks can weed out erratic developments in data sources (e.g. due to conceptual changes), can help in detecting all sorts of compilation errors and are important in making estimates during all various stages of the compilation process. What is regarded as plausible is ultimately decided by the compilers’ skills in inventing plausibility checks, by the compilers’ skills in finding plausible answers and by the compilers’ personal knowledge and model of the national economy.

The estimation process is influenced by *environmental factors like skills* (e.g. skills in combining data and making plausible assumptions), *resources* (e.g. resources for compiling good price-statistics, for maintaining a reliable business register or for compiling national accounts statistics) and *policy* (the strategy of continuity, preference for prudence and stability, priorities for some parts of the national accounts and independence).

#### *The compilation process in six steps*

Compiling national accounts statistics can be summarised in six steps:

- 1 Specify the operational model;
- 2 Collect data;
- 3 Translate the data into the concepts of the operational model;
- 4 Make an incomplete set of first estimates;
- 5 Add supplementary estimates;
- 6 Balance parts and the total.

The first step, i.e. the specification of the operational model, determines what is actually to be estimated. It was already discussed in section 7.2. In this subsection therefore the other five steps are discussed.

#### *Step 2: Collection of data*

The second step is the collection of data and qualitative information. The major data sources are usually specific statistics, e.g. on the sales and production costs of producers, on capital formation, on employment, on wages and salaries, on household expenditure, on consumer prices, producer prices and interest rates, on imports and exports or on revenues and expenditure by government bodies.

However, raw administrative data (i.e. those that are not translated into a specific statistic) can also be very important for compiling the national accounts. This can apply to e.g. VAT-records, the business accounts of some big companies, annual reports by supervisory bodies on banking and private insurance or the annual or quarterly accounts of the central government and social insurance bodies. Furthermore, also mainly qualitative information can be important. For example, articles in newspapers or specialised magazines may provide qualitative information on developments (e.g. on sales of furniture or software) or specific events (e.g. a big direct investment project or a reorganisation of a social insurance). This information can be used to complete other data, to check the plausibility of other data or to decide on the best way of bookkeeping for specific events and developments.

The inputs collected can play a direct or indirect role in compiling the national accounts. Direct inputs are specific statistics or administrative data sources used directly in estimating national accounts statistics. Qualitative information can never be a direct input, as it should always be translated into quantitative terms before it can be used in the compilation process. Specific statistics and administrative data sources can also serve as indirect inputs. For

example, in compiling national accounts figures for 2000, specific statistics can be used that refer to earlier years or to 2000. Similarly, tax data can not only be used to estimate national accounts data on taxes, but also to estimate the tax base or to check the plausibility of such an estimate.

The collection of inputs is not a passive role but requires a lot of structural and ad hoc work. This work may consist of e.g.:

- negotiations and agreements on data delivery: which data will be delivered, which detail and frequency, when, in what format, how reliable, etc.
- the active monitoring and checking of the data delivery: do the data really arrive at the time and as complete and detailed as agreed upon or expected;
- the storage of the data in the automated systems for compiling the national accounts: this can be e.g. typing in information into spreadsheets or data bases, selecting only the for national accounts purposes relevant parts or translating data to the type of software or layout used by the national accountants;
- the search for other relevant quantitative and qualitative information, e.g. by reading specialised journals, newspaper articles and annual reports or by explicitly asking corporations, institutions and experts.

### *Step 3: Translate the data into the concepts of the operational model*

The third step is to translate the input-data into the mould of the operational model. In this respect it is meaningful to distinguish two types of input-data: economic base statistics and other, generally administrative, data.

*Economic base statistics* generally translate administrative concepts into national accounts concepts or proxies of them. Cases in point are production statistics and government finance statistics:

- A production statistic (the results of statistical inquiry of producers) is often based on a transition scheme deriving national accounts concepts of production from the questions asked of business in the questionnaire. For example, the value of production according to the national accounts can be defined as the aggregate of sales of own-production, net change in stock of own-production, own-account capital formation, trade margin on goods and services produced by other units, sales of other goods and services (e.g. rental) and other revenues excluding royalties on subsoil assets but including revenues for overhead activities (see Bos, 1992c, pp. 14-15).
- Government finance statistics on the state government can be compiled by translation of administrative records of the state government into the national accounts concepts of government revenue and expenditure and their components. For a proper translation it is generally required to exploit additional explanations about the exact content of each budgetary chapter and article.

As a consequence, often only minor adjustments of such input-data are required to comply fully with the operational model. A major difference between economic base statistics and the national accounts is often the product breakdown. For economic statistics with very detailed product-breakdowns, like Foreign Trade statistics, translation towards the national accounts classification involves the use of a transition scheme at a rather aggregate level. However, for other economic statistics, e.g. household budget surveys or a production statistic with respect to intermediate consumption, the product-breakdown can be very limited or rather different. In such instances, product-groups in the economic statistics are to be split and re-arranged in order to derive the product-breakdown of the national accounts.

In case of the direct use of *administrative records* the translation from administrative concepts towards the operational model is to be performed by the national accountants themselves. This applies to e.g. VAT data, personal income tax data, business accounts of

some very big companies, annual accounts of the biggest municipalities, supervisory reports by the Central Bank on the banking sector or social security institutions on wages, social security contributions and social security benefits. However, it should be noted that the data needs of the national accounts may have been taken explicitly into account in some administrative records, e.g. when reporting for the government budget is based on national accounting concepts.

#### *Frames of reference*

The backbones for compiling national accounts statistics are the frames of reference. Frames of references provide a listing of all the existing enterprises, institutions, persons and households and their major economic characteristics, e.g. size in terms of number of employees or sales and type of product sold. Frames of reference can be e.g. a business register based on Chamber of Commerce-registrations, a VAT-register, a population census or a count of employment. In order to obtain a complete and up-to-date frame of reference, it is generally necessary to combine the data from various data sources.

Frames of reference serve two major roles. Firstly, they are used to draw samples for surveys and to gross up surveys or administrative data for units missing, e.g. relatively small units or units exempted from registration. Secondly, they are used to combine different data sources and to transform the many partial estimates into a complete estimate about all producers, employees or consumers in the national economy.

In compilation practice, different registers may be used for different groups of producers, e.g. a VAT register, a register with government units, a register with banks and insurance companies and a register for health care institutions. This will generally imply omissions and double-counting in estimating the national economy. Furthermore, the use of registers that are not up-to-date and reliable information (e.g. with respect to the size of the different companies or about the number of households) will cause unreliable estimates about the size and developments in the national economy.

#### *Step 4: An incomplete set of first estimates*

The fourth step is to make a set of first estimates. Before actually starting to estimate, various plausibility checks on the various potential input-data are made. Examples of such plausibility checks are:

- Check on the plausibility over time of one variable in one data source. For example, detecting erratic developments in output like increases of 20% and decreases of 30% in the next year without any clear motivation. Another example is detecting that a major part of the increases in VAT-receipts was not due to increased sales but was caused by accelerated collection.
- Check on the plausibility of the level and development of ratio's between different variables in one data source, e.g. between the volume of labour and the output.
- Check on the plausibility of values and volumes in one data source, e.g. increases of output with 20% accompanied by decreases of employment with 5% is generally not very plausible.
- Check on the plausibility by comparing different data sources, e.g. a detailed production statistic are compared with more general information on the developments in one industry, with export statistics on the major product of this industry or with information on wages or employment of that industry.

For many different reasons, the first estimates are usually *based on several data sources*, e.g.:

- One data source is used for determining last year's level, while the change in level is derived from another, less reliable, data source. The reason for this mixed estimate is that the most reliable data source is not available for the current year.
- One data source is used for estimating the level of a variable, while another is used for estimating the composition (e.g. the breakdown by product-group). The reason for this mixed estimate is that the first data source does not contain (sufficiently reliable) information on the composition.
- One data source is used for estimating the level of a variable, but corrections for conceptual differences (e.g. income in kind or underreporting of sales, income and employment) are derived from other data sources. The reason for this mixed estimate is that the first data source does not fully comply with the concepts of the operational model.
- One data source is used for estimating the level of a variable, but corrections for missing units or units not to be included are derived from other data sources. This grossing up is usually done on the basis of a business register, a VAT-register, a register on the number and composition of households or a population census. The reason for this mixed estimate are that the first data source does not comply to the classification of units in the operational model.
- One data source is used for estimating the volume of a variable, while another data source is used for estimating the price. An example is the estimation of agricultural output as harvest estimates in tons per product times auction prices for agricultural products. Another case is point are the services of owner-occupied dwellings: by convention they are to be estimated as the volume of dwellings times the market rent for similar dwellings.
- One data source is used for estimating the value of a variable, while another data source is used for estimating the price or volume.

The first estimate can involve various types of *assumptions*, e.g.

- The data in the sample (e.g. a survey of households or establishments in construction) or administrative data sources are sufficiently representative for those not included.
- Unchanged composition of a total, e.g. about the commodity breakdown of intermediate consumption by industry or about the breakdown of car registration taxes paid by consumers and by producers (by industry/institutional sector).
- Similar development of a total, e.g. assuming the prices changes observed for some products are relevant for others to or that the average price change observed is a solid approximation of the average price change for the parts not observed.
- Constancy of a ratio, e.g. between sales and the number of employees of an establishment, between taxes on products and the sales of these products or between income transfers by the government and the compensation of employees and purchases of goods and services financed by these transfers (e.g. income transfers to public schools)
- The change in the volume of government output is equal to the change in the volume of the various costs of production plus a fixed productivity increase of 1%.

*Former estimates of the national accounts* can also serve as a data source. This applies when the level of last year is extrapolated or when some breakdowns of last year are incorporated in the first estimates. The former estimate can reflect all elements of the previous compilation process, i.e. the inputs, the successive estimates and the balancing.

#### *Step 5: Secondary estimates resulting in a complete set of estimates*

The fifth step is to add secondary estimates. These secondary estimates are made starting from the set of first estimates.

These secondary estimates are often the direct consequence of applying national accounts identities. Examples are:

- In a commodity-flow approach final consumption expenditure by households can be estimated as a residual item.
- Final consumption expenditure by households can also be estimated as the sum of the first estimates of final consumption per product-group.
- Value added can be estimated as the residual of output minus intermediate consumption minus consumption of fixed capital,
- Taxes paid by the various sectors can be estimated starting from the taxes received by the government.
- Government output is defined as the sum of the various production costs. As a consequence, government output can only be estimated starting from the estimates of these costs.
- Imputed insurance services can only be recorded as final consumption expenditure, intermediate consumption or exports after the size and development of the production of these services has been determined.

However, there are also some other types of secondary estimates, e.g.

- Splitting of the first estimates. For example, the first estimate of car registration taxes is to be split into those paid by producers (i.e. taxes on production) and those paid by consumers (i.e. current taxes on income, wealth, etc.). Similarly, income in kind can be first estimated on the basis of income tax data and should then be allocated to the industries involved. Another case in point are sales via retail trade: these should be split into those bought by producers, those bought by domestic households as consumers and those bought by tourists.
- Exploiting institutional relationships, e.g. the data on excise duties on beer are used to estimate the sales of beer, the investment grants on infrastructure are used to estimate capital formation on infrastructure or the income transfers by the state government mainly financing other government units are used to estimate the size of the expenditure by the latter.
- Exploiting economic relationships, e.g. the first estimate of output in some industries is used to estimate their capital formation or their employment or the first estimate of loans by banks to non-financial corporations is used to estimate also the corresponding interest payments. Some of these estimates may also be based on regression analysis.
- Exploiting technical relationships, e.g. knowledge about chemical processes can be used to produce a plausible estimate of the composition of the inputs and outputs of chemical industry.

The fifth step includes also tertiary and even much more indirect estimates. For example, suppose capital formation for the national economy is a secondary estimate on the basis of the supply of capital goods and the exports of capital goods. Capital formation by industry is then a tertiary estimate. Estimating capital stock by industry is then the next estimate. Starting from this estimate consumption of fixed capital by industry can then be estimated. This is then a quintal estimate.

After the fifth step, a set of estimates complete in detail and scope should have been obtained. Our examples have illustrated that the *sequence of estimation is generally not a straight-forward bottom-up approach*. It is much more likely to be a very complicated mix of bottom-up, top-down, left-right (e.g. first supply and then demand or first taxes received then taxes paid), right-left, from values to prices and volumes, from prices and volumes to values, from flows to changes in stocks and from changes in stocks to flows, etc. Only in this way the limited set of available data can be exploited in the most efficient way.

*Assumptions* have a leading role in completing the estimates. They are necessary to fill all major and minor gaps and imperfections in the basic data set. This implies that the more encompassing, up-to-date, detailed, reliable and conceptually close the basic data set, the

smaller the role played by assumptions can be. Gaps and imperfections can first be mended by plausible assumptions (e.g. by exploiting economic and institutional relationships and by using a reliable and up-to-date frame of reference). All remaining gaps are then to be completed with more bold assumptions. For very small parts of the economy (e.g. construction companies representing about 10% of the total number of employees in the industry construction), this can be quite harmless. However, when bold assumptions about substantial parts of the national economy are necessary, national accounts statistics transform into guesswork.

*Step 6: Balancing plausibility and consistency*

The fifth step results in a complete set of estimates. However, this set is generally not consistent and not entirely plausible. The sixth step is therefore to balance parts and the total<sup>98</sup>.

*Balancing is an overall plausibility check on the economic coherence of the estimates.* What is actually checked on plausibility depends on the available accounting framework and the compilers' skills in inventing and performing plausibility checks in combination with the available time. A more encompassing and detailed framework gives more opportunities for plausibility checks. For example, a supply and use framework allows a lot of plausibility checks, in particular when there is a simultaneous balancing in current and constant prices. Balancing is generally rather unimportant for compiling very timely national accounts statistics.

*Balancing can also amount to enforcing consistency*, i.e. preferring one estimate to another without having a clear opinion about which estimate is the best. Such enforced decisions will be more frequent and painful in case of rather well and complete sets of basic data in combination with a well developed compilation process involving numerous plausibility checks. Such enforced decisions hardly occur in case of a small set of reliable basic data and a very elementary compilation process. In the latter case, the focus will be fully on providing a complete set of estimates, i.e. step 5 is then the last step.

Balancing can involve intensive interactive balancing at desegregate levels, between different levels of aggregation and between various parts of the national accounts. Examples of such balancing can be:

- Balancing the supply and use of specific product-groups, e.g. achieving consistency and plausibility for the supply and use of textile or oil.
- Balancing the resources and uses of very specific transactions, e.g. the payment of public transport subsidies and the receipts of public transport subsidies or the payment of income transfers by the state-government to municipalities and the receipts of municipalities of income transfers by the state-government.
- Balancing the overall supply and use of goods and services while investigating the plausibility of the development of the supply and use of specific product-groups, e.g. those with respect to construction.
- Balancing simultaneously the production approach and the income approach for estimating GDP, e.g. with respect to compensation of employees by industry and operating surplus.

However, in practice it may also amount to a quite mechanical procedure. For example, GDP may be taken by convention as the average of the estimate of GDP via the production approach and that via the expenditure approach.

Balancing as a plausibility check amounts to *finding a plausible story behind 'strange' developments*, i.e. what explains this development and which data sources and assumptions underlie these estimates. Two examples from Dutch compilation practice may illustrate this.

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<sup>98</sup> On balancing in a supply and use framework, see e.g. Bos and Gorter (1993), pp. 120-130.

In the eighties the basic statistics indicated that intermediate consumption of the car and bicycle-producing industries increased rapidly, while production remained rather stable. This appeared rather implausible, but in balancing the input-output tables also a steep increase in the imports of components for car and bicycle production was noted. It was concluded that the Dutch car and bicycle producers were more and more becoming assemblers of cars and bicycles.

In 1996 and 1997 the basic statistics indicated that the labour productivity of the telecom-industry had increased by over 15%. This seemed rather implausible, but further investigation -of e.g. annual reports of the major companies involved- confirmed this development.

External experts can play an important role in finding plausible answers. For example, they can indicate that specific events have occurred like a strike or explosion in some big plant. They could also signal major changes in the concepts or compilation methods underlying the various data sources, like a change in the concept of wages in social security records or delays in recording changes in the number of unemployment benefits in one big administration.

What is regarded as plausible depends also on the compilers' personal knowledge and model of the national economy. Three anecdotes from Dutch compilation practice may illustrate this.

One compiler was in his private time an aeroplane watcher; he loved to look at planes coming and going at Schiphol and other Dutch airports. At some stage in the balancing process, the estimated use of capital goods substantially exceeded the supply of capital goods. He detected that some specific aeroplanes had been recorded as capital formation in capital formation statistics. However, on the basis of his personal knowledge as an aeroplane watcher he knew that these planes had not yet arrived in the Netherlands. He investigated the Foreign Trade Statistics, which indeed did not include the imports of these aeroplanes. This solved the inconsistency between supply and use: capital formation statistics included these aeroplanes when paid, while foreign trade statistics included these when delivered. The estimates of capital formation were adjusted, as the time of recording in the foreign trade statistics complied with the recording principles of the national accounts.

The second anecdote refers to knowledge of technical relationships. A new compiler was working on balancing the supply and use of paper and related products. In the Dutch input-output tables, part of paper was assumed to be used for wrapping cigarettes. However, he had a background in chemicals. He therefore knew that for this purpose not ordinary paper is used, but a type of paper produced by the chemical industry. The estimates were therefore adjusted on the basis of this new knowledge. So, for many years, insufficient technical knowledge had led to a wrong assumption about technical relationships. Similar errors can be made in exploiting economic and institutional relationships.

The third anecdote refers to the so-called method 'Nooteboom', a former chief in the Dutch national accounts department. He was said to have a quite personal way of checking the plausibility of the estimates by his employees. When these estimates deviated substantially from his personal impression of the developments in Leidschendam, i.e. his place of residence, they were considered to be suspicious and had to be justified by his employees. As a consequence, the estimate of the development Dutch economy was partly benchmarked and calibrated on the basis of the developments in one Dutch town.

Balancing is in practice not only important for solving complicated estimation problems. An important function of balancing is also to weed out various elementary human errors. Examples are a typing error drastically increasing output in a specific industry, a communication problem resulting in twice grossing up of a survey, and a drastic decrease of



social benefits due to the thoughtless processing of social security data in which definitions or presentation have been changed.

*Consistency checks* are an elementary type of plausibility check: if estimates are inconsistent, there should be an error in the estimates. Inconsistency can therefore help in tracing errors in the estimates. However, it can happen that despite a thorough reinvestigation no plausible explanation for this inconsistency is found. This can then only be solved in two ways.

The first solution is to modify the best estimates of some variables or part of the breakdown of variable (e.g. in some of the product-groups of final consumption expenditure by households). In general this will be done where it does the least harm, e.g. where the estimates have the greatest margin of uncertainty or in which data users are least interested.

The variables that are each time sacrificed serve as a sort of garbage bin. Examples of such garbage bins can be changes in inventories or the use of business services (in order to solve the supply and use by product) and net sales of land by municipalities (in order to reconcile a plausible estimate of net lending with plausible estimates of the major categories of income and expenditure).

When the standard garbage bins are full or when there are no clear garbage bins available, painful choices are to be made for the sake of consistency. This can apply e.g. to For example, a global indicator of final consumption expenditure by households, like VAT-receipts, may indicate drastic increases, while the data for none of the quantitatively important product-groups in household final consumption expenditure provide a clear explanation for this. *The choice is then between a reliable global estimate without a plausible underpinning by product-group and a not reliable global estimate with plausible estimates by product-group.*

The second solution is to *show the inconsistency explicitly*. This is an approach often adopted for the substantial and highly fluctuating differences between net lending estimated from the non-financial side and net lending estimated from the financial side. Suppose the estimate from the financial side is considered to be the best. Consistency could then be achieved by modifying the estimates of the non-financial transactions, but which are to be adjusted: output, compensation of employees, interest payments? Substantial and highly fluctuating differences lead to substantial and highly fluctuating adjustments. This puts severe strains on the plausibility of the estimates over time. Consistency could also be achieved by modifying the estimates of the financial transactions, but which are to be adjusted: are there more loans, what is the other party involved, etc. Such very difficult too reconcile differences occur generally for estimates of net lending of the sectors Rest of the World, Non-financial corporations and Households. For the sector Financial Corporations and Government such awkward inconsistencies are less likely, because the estimates of net lending for these institutions are often mainly based on rather complete and consistent sets of financial and non-financial accounts.

When one way to estimate Domestic Product is preferred to another (e.g. a production approach estimate is preferred to the income approach), the latter can be reconciled by showing explicitly the adjustments needed to obtain consistency. Similar explicit adjustments could be made in reconciling national accounts estimates of employment and employment statistics.

In the Netherlands, also a difference is explicitly shown between imputed Value Added Tax (VAT) and paid VAT. The imputed VAT is the VAT calculated in the context of the supply and use framework. The paid VAT is the VAT according to the government accounts and the tax administration.

Explicitly showing such differences between estimates is in particular a suitable solution when the inconsistencies are very big and not stable over time and where no relatively

unimportant residual item(s) can be found. Nevertheless, very big and unstable inconsistencies, but also clear trends in the size of the inconsistencies, can still raise fundamental questions about the reliability of the estimates. For example, in the Netherlands the difference between imputed VAT and paid VAT was stable for many years, but declined then suddenly. The general revision of the Dutch national accounts was used to avoid that the paid VAT would even surpass the imputed VAT. Unfortunately, despite substantial efforts, no clear explanation for the not very plausible development of the difference between imputed and paid VAT has yet been found.

So, in compiling national accounts statistics consistency and plausibility seem to be friends but can also be foes that are difficult to reconcile. For the sake of consistency, solid estimates may have to be adjusted. The alternative is to present inconsistent set of estimates. In some cases, national accountants prefer the latter solution, i.e. prefer not to present an illusion of consistency.

#### *A more complex picture*

These six steps give in four respects a too simple picture of compilation practice: there is no strict chronology of steps, no identical compilation process each year and not one compilation process and furthermore it ignores the role of compilation policy.

#### *No strict chronological sequence of steps*

Firstly, these steps do not represent a strict chronological sequence of separate steps: in practice all these steps are intertwined, interact strongly, can occur in somewhat different chronological sequences and have recursive loops. For example, while balancing attention can be paid to the operational model, the plausibility of specific input-data and the translation into national accounts concepts.

#### *Changing compilation processes*

Secondly, a major feature of the national accounts is that the compilation process is not identical each year. This reflects that the available data sources and the national economy are not stable over time. Examples of changes in data sources are the arrival of new data sources, the disappearance or temporary absence of some data sources or changes in the scope and concepts. As a consequence of such changes, the compilation process should often be adjusted. The same may apply to changes in the national economy, e.g. a new type of subsidy, new financial instruments, drastic increased importance of specific products (ICT) or a specific big event (e.g. a flood destroying crop).

#### *Outcome of many successive compilation processes*

Thirdly, the six steps suggest that a set of national accounts statistics is the outcome of one compilation process. However, a set of national accounts statistics is generally the outcome of many successive compilation processes over a very long period of time. First, for a base year or a base period of several years national accounts statistics are compiled. Secondly, starting from the base year estimates, for more recent years final estimates are compiled with some years delay. Thirdly, starting from the most recent final estimates, for the most recent years provisional estimates are compiled with some months or one or two years delay. Fourthly, starting from the base year estimates, time-series are made for years before the base year. Fifthly, several countries now and then revise all their estimates, e.g. after a period of ten years.

### *Compilation policy*

Fourthly, the six steps are silent about the role of *compilation policy*. However, the compilation policy influences the reliability of the national accounts statistics in several ways.

- by choosing the timeliness of publication;
- by allocating the resources;
- by choosing a strategy of continuity;
- by choosing a strategy for prudence and stability of the estimates.

The more timely national accounts statistics should be published the less data sources are available. As a consequence, more timely national accounts statistics should in principle be less reliable.

By allocating the resources for estimating the different parts of the national economy, also the reliability of the estimates for these parts are influenced. For example, increasing resources for estimating the services-industries and decreasing those for manufacturing and construction, will likely (*ceteris paribus*) change the reliability of these estimates in the same direction. Similarly, by allocating more resources to more timely estimates and less resources to the later estimates also the reliability of the estimates is influenced. However, in this case in the long run also the more timely estimate may become less reliable, as the latter is built upon the estimates of the least timely estimates.

National accounts statistics should preferably be both *up-to-date and continuous*. The former requirement means that estimates must comply with the most recent findings. Continuity means that the data from different reference periods must be mutually comparable. These two requirements come into conflict whenever definitions change, the availability of data sources alters (e.g. a new more reliable data source becomes available) or estimation methods improve. Meeting the requirement of up-to-date estimates of levels means a permanently changing set of national accounts time-series and can be very labour-intensive. However, a never changing set implies continuous but never up-to-date estimates. Most countries adopt a compromise (a mixed strategy of continuity). In compiling the annual figures, the continuity aspect is often given priority –with the result that levels are not up-to-date in some cases. At intervals, however, the data are revised to bring the whole series into line with the updated level for a specific base year. The mixed strategy of continuity implies that the estimates do not always represent the best estimate of the level.

*Prudence and stability* can be other reasons for not pursuing the best estimate. When the best estimate suggests a very strong or surprising development in the national economy, a prudent estimate is a somewhat weakened, less surprising, development. *A prudent estimate can also refer to the estimation method itself, i.e. prefer a method that can be most easily explained and defended against criticism.* Examples of practical rules adhering to this principle are e.g.:

- make prudent assumptions, e.g. take an average or take the development of last year provided it was a ‘normal’ year.
- prefer the data source from the most reputed institutions;
- prefer an explicit data source to plausible assumptions;
- do not lightly deviate from long-established estimation methods;
- do not include any estimate at all when no solid information is available (e.g. on underreporting of income).

In case of successive published estimates, stability of the estimates can be an argument to deviate from the best estimate. It boils in fact down to a bias for the first published estimate, i.e. only deviate substantially from such estimates in case of strong evidence.

*Political pressure* may also influence the reliability of national accounts statistics. This occurs in particular when national accounts statistics are compiled by government departments or a dependent national statistical institute. An independent institute taking care

of compiling national accounts statistics is therefore an important requirement for reliable national accounts statistics.

## 7.4 Reliability

National accounts statistics have something miraculous, like the miracle of estimates based on a sample. The miracle of sample-estimates is that a sample suffices to make estimates about the whole population. The miracle of national accounts statistics is that a very incomplete, imperfect and partly outdated data set is transformed into a complete, consistent and up-to-date picture of a national economy. In section 7.3 the secrets behind this miracle have been revealed. In this section the consequences for the reliability of national accounts statistics are investigated.

### *The price of the ambition of the universal model*

The reliability and comparability of national accounts statistics have some fundamental bounds. These bounds are the mirror-image of the ambition of the universal model.

The ambition of the universal model is to provide a relevant, complete, consistent and standard overview of national economies all over the world. This ambition has clear and inherent trade-offs with reliable and comparable estimates, because:

- for the sake of relevance various imputations are to be estimated, e.g. income in kind, consumption of fixed capital, the services of owner-occupied dwellings or reinvested earnings on direct foreign investments. However, a reliable estimate of such imputations is inherently difficult.
- complete estimates of national economies are to be made, while in all countries for some parts no reliable data (e.g. services industries or illegal production) are available; this implies that the national accounts statistics for these parts of the national economy will be less reliable.
- one universal model is to be estimated even though available data sources, specific circumstances and resources for compiling economic statistics differ widely internationally and inter-temporally; this implies that the reliability will differ widely internationally and inter-temporally.
- consistent estimates of national economies are to be made following standard national accounting concepts, while the concepts in data sources are often inconsistent and can deviate substantially from the national accounts concepts; this implies that necessarily imperfect modifications are to be made for conceptual differences.
- A complete set of price and volume measures is to be estimated even though perceptions on volumes and quality may differ widely or are not well specified by economic actors. This implies that reliability and comparability is in particular a problem for price and volume measures.
- The universal model can never serve as the operational model. This implies that differences in operational models will always affect international comparability.

### *Relatively reliable?*

National accounts statistics are generally the only available estimates of the universal model. As a consequence, they are relatively reliable for the model as a whole and its major aggregates like GDP.

For specific parts or individual variables, e.g. household consumption expenditure, alternative data sources can be available, e.g. a household budget survey. There are several

reasons why national accounts statistics are likely to be more reliable and comparable than such alternative data sources:

- National accounts statistics will in general incorporate all reliable data sources on specific parts of the national economy; it combines these data in a sophisticated bookkeeping system which allows various extra checks on the reliability of the data.
- National accounts statistics reflect generally a long and intensive experience with the merits and limitations of the various data sources available nationally. For example, they include various standard corrections for omissions and errors in these data sources. They will therefore be more reliable than individual data sources.
- Due to the universal model, national accounts statistics are relatively explicit about what they want to measure, e.g. which concept of capital formation is employed or which definition of wages is used.
- National accounts statistics are each year based on the same set of universal concepts;
- National accounts statistics of different countries are based on the same set of universal concepts;
- National accounts statistics will not reflect political interference when compiled by an independent institute. Some other data sources may be clearly subject to political interference.

However, national accounts statistics are not necessarily the most reliable estimate for specific parts or individual variables. Several reasons have been mentioned in section 7.3:

- Compilation policies of continuity, prudence and stability may require not to make the best estimates as such, e.g. the use of a new and better data source may lead to discontinuous estimates;
- A data source may arrive with too long delay (e.g. income tax data arriving with four years delay) and is therefore not incorporated in the national accounts statistics;
- The allocation of resources may amount to limited efforts for making a best estimate of some variables, some very specific detail or some part of the national economy. For example, an estimate is based on simple assumptions instead of labour-intensive compilation efforts needed for a best estimate;
- Consistency may enforce to sacrifice some of the best estimates.

### *International comparability*

Differences in compilation methods may also affect the international comparability of national accounts statistics. So, for international comparisons for specific parts or variables it may be worthwhile to ignore national accounts statistics and to process data sources available in several countries (e.g. manufacturing statistics) in one standard way. This may result in more comparable and reliable data, e.g. of manufacturing output per employee.

### *Assessing reliability*

For many uses of national accounts statistics, it does not suffice to know that the figures are the most reliable estimates available. For a proper use and interpretation of national accounts statistics it is also important to know how reliable they are, e.g.:

- are the EU-Member States GNP-estimates sufficiently reliable as a tax-basis for the European Union?
- Is the small drop in GDP-growth a statistical artefact or a real economic development?
- Are the supply- and use-tables sufficiently reliable to draw conclusions about trends in the contracting out by specific industries or developments in the relative prices of some specific products?
- How reliable are the coefficients of an econometric model estimated on the basis of national accounts time series?

*What is reliability?*

Following Novak (1975), reliability can be defined in terms of accuracy and consistency. Accuracy is defined as the discrepancy between the observed and the “true” values. Since the “true” values must usually be approximated, the results of accuracy tests may themselves be subject to errors and biases. Accuracy tests can not be applied directly to national accounts statistics, but they could be applied to the basic data, like statistical surveys and administrative data records.

Consistency is defined as the discrepancy between two or more observed values, all of which could depart considerably from the “true” value. Consistency between two observed values can not prove accuracy. Consistency tests provide merely methods for detecting deficiencies in accuracy. Consistency tests are very suitable for the national accounts, as they can show the sensitivity of national accounts statistics for using different data sources or estimation methods.

*Sampling theory?*

Sampling theory indicates how to estimate the accuracy of sample estimates. However, in the national accounts sample estimates play a minor role, e.g. many administrative data sources are used, many specific estimation methods are used and big companies and institutions (e.g. the state government) have a disproportionate economic importance. Non-sampling errors are therefore dominant in national accounts statistics, e.g. false reporting or the use of an outdated business register. As a consequence, sampling theory has not much to offer in assessing the reliability of national accounts statistics.

*Investigating the data sources, operational model and compilation methods*

The reliability of national accounts statistics can also be assessed by investigating the data sources, the operational model and the compilation methods. For example, the Dutch inventory on compiling GNP-estimates contains a table indicating that 76% of the GNP-estimate from the production side is based on good-quality institutional data sources available annually (see table 7.1). These data sources can be e.g. production statistics (e.g. for manufacturing), reports from supervising bodies (e.g. on banking and insurance), government finance statistics and annual reports, e.g. of some big companies. The reliability of these data sources can be clarified further by indicating their major features, e.g. the sample size of the survey and their quantitative importance vis-à-vis the population, major conceptual differences with the national accounts and biases in the registration (e.g. underreporting, the absence of small units, inadequate coverage of new products and false reporting of values and type of product produced or sold in order to reduce tax liabilities and to evade administrative obligations). Furthermore, the reliability of national accounts statistics can be disclosed by making explicit the size and motivation of the major corrections on the basic data, the cross-checks made and the major assumptions used.

Table 7.1 Five groups of compilation procedures (production approach; see Bos and Gorter, 1993, p. 14)			
Compilation method	Industry	Value added	Good quality institutional data sources
Production statistics	Manufacturing	51%	51%
	Public utilities		
	Construction		
	Trade, hotels, .. Repair of consumer goods		
	Transport and storage		
	Part of business services		
Good-quality data sources from supervising bodies	Banking, finance, insurance	5%	5%
Estimated (partly) functionally	Agriculture	13%	0%
	Operation of dwellings		
Estimated from the costs side	General government	15%	11%
	Subsidized education		
	Social services		
Estimated (mainly) on the basis of annual reports	Mining and quarrying	8%	8%
	Communication		
	Intramural healthcare		
Miscellaneous	Other services	8%	0%
		100%	76%

#### *Consistency of successive estimates*

The most simple way to test consistency is to look at the national accounts statistics themselves, i.e. at differences between successive estimates and at differences within one set of estimates.

National accounts statistics are often published as a series of successive estimates. The first estimates are the most timely, but are also the least reliable. Later estimates can be based on more data sources and are therefore more reliable. Systematic investigation of the differences between these estimates can also reveal some important statistical qualities of the estimates. This is illustrated by a sample of one year from Dutch national accounts statistics (see table 7.2).

The Dutch national accounts contain four successive estimates, in chronological sequence: quarterly accounts for a limited set of variables, preliminary annual estimates, semi-final annual estimates and final annual estimates. Table 7.2 compares the final estimates for 1998, with earlier estimates. The estimates pertain to the volume-change, the price change and the level of some major aggregates, like GDP and final consumption expenditure. Furthermore, some key-ratio's are presented, e.g. national income per capita and government net lending as % of GDP. The table suggest that:

- Later estimates are generally better, i.e. closer to the final estimates;
- Volume-changes may be more difficult to estimate than price changes;
- Volume-changes of relatively volatile variables, like capital formation and exports, are more difficult to estimate than less volatile variables, like final consumption expenditure by the government.
- A particular category of volatile variables are balancing items, like net lending by the government, value added and net exports. They include the estimation errors of the underlying variables, e.g. the estimation error in the price of gross value added is the net result of the estimation errors in the prices of output and intermediate consumption.
- Ratio's as a percentage of GDP are not very sensitive to estimation errors.

Table 7.2 A comparison of successive estimates in the Dutch national accounts

	Final vs semi-final 1998	Semi-final vs preliminary 1998	Final vs preliminary 1998	Final vs quarterly 1998
Volumes-change (%)				
GDP	0.2	0.4	0.6	0.5
Final consumption expenditure	0.3	0.2	0.5	0.5
government	0.2	0.1	0.3	1.1
households	0.4	0.3	0.7	0.3
Capital formation	0.1	-1.1	-1.0	0.2
Imports	0.5	0.3	0.8	2.4
Exports	0.0	1.0	1.0	0.1
Employment	-0.1	0.3	0.2	
Average size of deviation	0.2	0.5	0.6	0.7
Average deviation	0.2	0.2	0.4	0.7
Price-change (%)				
GDP	-0.3	0.1	-0.2	-0.3
Final consumption expenditure	-0.2	0.0	-0.2	-0.4
government	-0.5	-0.2	-0.7	-1.3
households	-0.4	0.3	-0.1	-0.1
Capital formation	-0.1	0.4	0.3	0.4
Imports	0.0	0.0	0.0	0.8
Exports	-0.2	0.0	-0.2	0.2
Average size of deviation	0.2	0.1	0.2	0.5
Average deviation	-0.2	0.1	-0.2	-0.1
Ratio's				
NNI per capita	-0.3	-0.9	-1.2	
GDP per full-time equivalent	0.2	-0.2	-0.1	
Government expenditure % GDP	0.14%	-0.15%	0.00%	
Government revenue % GDP	0.01%	-0.06%	-0.05%	
Government net lending % GDP	-0.14%	0.09%	-0.05%	
Value added by the gov. % GDP	0.0%	0.0%	0.0%	
Imports as % of GDP	0.3%	0.0%	0.2%	
Exports as % of GDP	-0.2%	0.2%	0.0%	
Net exports as % GDP	-0.4%	0.2%	-0.2%	

By compiling such figures for a long range of years, important statistics about the reliability of the national accounts statistics of a country can be derived, i.e. statistics about statistics<sup>99</sup>. These statistics can reveal the average size of the estimation errors and the occurrence of systematic under- or overestimation in general and in specific situations, e.g. in case of substantial changes in the trade cycle. More detailed investigation can also clarify the

<sup>99</sup> In the Netherlands, statistics on differences between successive estimates will be regularly published as part of general policy of quality control (see Kazemier and van Rooijen, 2002).



links with the arrival of specific data sources and changes in compilation methods and policy, e.g. extra efforts to improve the reliability of the flash and preliminary estimates.

Such statistics on national accounts statistics can also be regarded as a *simulation of the effects of less data sources, less reliable data sources and less resources and time for compiling national accounts statistics*. In this way, the relatively reliable national accounts statistics of countries like the Netherlands can also give a rough impression of the reliability of national accounts statistics of countries with much less data sources.

However, for two reasons the *differences between the successive estimates give a too optimistic picture*. Firstly, in compilation practice a major role of the final estimates is also to calibrate the more timely estimates, e.g. to reveal their systematic errors. Secondly, ratio's derived from the final estimates of last year are often used as inputs for the more timely estimates of the current year. As a consequence, the margin of error of the more timely estimates would have been substantially larger when the final estimates were not known and were not used in compiling the more timely estimates.

In many countries, national accounts statistics are once in a while revised. The changes in the estimates due to a revision (corrected for any changes in concepts) can also give an impression of the reliability of national accounts statistics. As part of the harmonisation of European GNP-estimates, the estimates of several countries have been revised substantially, i.e. by 5%, 10% or in one case even 20%. So, the margin of error of GNP of the least reliable European national accounts statistics was between 5-20%. The GNP-estimates of many countries outside Europe are based on a similarly weak or even weaker statistical infrastructure. Similar margins of error can therefore be expected in the GNP-estimates of these countries.

A common feature of the adjustments in Europe was that all the major adjustments were upward adjustments. Furthermore, most of the smaller adjustments were also upwards. This suggests that in compiling national accounts underestimation is a more serious danger than overestimation. This can reflect prudence as a compilation strategy. However, it can also reflect:

- prudence in specific cases, e.g. in estimating parts of the economy on which data are very scarce.
- Ignorance. For example, the compilers are ignorant about the existence or scale of some economic activities and therefore do not include separate estimates on these activities.
- a lack of interest in estimating on some specific parts of the national economy, e.g. limited compilation efforts are devoted to estimating some types of services-industries.

#### *Consistency of different estimates*

One set of national accounts statistics may also show differences between different estimates. The most common is a *difference between net lending estimated from the financial side and net lending estimated from the non-financial side*. This occurs in particular for sectors where the data sources and estimation process differ substantially for both sides<sup>100</sup>. This will in general not apply for financial institutions and the government, but it will often for households, non-financial corporations and the rest of the World.

In the Dutch national accounts, the differences shown for 2000 are 1 bln euro for the Rest of the World, 2 bln euro for households and 3 bln euro for non-financial corporations. These differences can reflect all kinds of measurement errors in the financial and non-financial flows, e.g.:

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<sup>100</sup> Minor differences are easily to be reconciled by taking the estimate of one transaction as the residual item.

- the 1 billion euro difference for the Rest of the World can indicate that net exports is not 20 billion euro but 19 billion euro. However, it could also indicate that the change in foreign equity is not 32 billion euro but 31 billion euro.
- The 2 billion euro difference for households can indicate that household expenditure is 195 billion euro instead of 197 billion euro. However, it could also indicate that compensation of employees received by households is 458 billion euro instead of 456 billion euro.
- The 3 billion euro difference for non-financial corporations can indicate that net operating surplus is 118 billion euro instead of 121 billion euro. However, it could also indicate that the change in liabilities is 189 billion euro instead of 192 billion euro.

The differences between the estimates of net lending can overestimate and underestimate the measurement error in individual variables. Overestimation occurs when the measurement error is not located in one variable but is spread over many. However, underestimation is also likely, because measurement errors can partly compensate each other, e.g. an underestimation of exports can be compensated by an underestimation of imports.

Substantial changes in the statistical difference from one year to another can also indicate errors in measuring the change over time of some specific variables.

### *Sensitivity analysis*

Sensitivity analysis is a very important tool to shed light on the reliability of national accounts statistics. Five examples may illustrate this. They cover a broad range of measurement errors:

- the recording of fraud;
- foreign trade statistics;
- capital consumption, in particular in the life times of fixed assets.
- price and volume measurement;
- signalling new developments.

The first example is Broesterhuizen (1983). He investigated the reliability of Dutch GDP estimates in view of *fraud*, i.e. not reporting or underreporting of income to the tax and social security authorities or in statistical surveys. For this sensitivity-analysis, GDP estimation was distinguished into six components reflecting the Dutch data and compilation process:

1. "Indirect methods", e.g. agriculture and operating of real estate are estimated by multiplying estimates of the volume of sales/output by an estimated price;
2. "Government", including also many enterprises and institutions supervised by the government, like public utilities, national railway and telephone companies, banking and insurance and hospitals.
3. "Large firms", i.e. with more than 100 employees and included in surveys of producers;
4. "Small firms", i.e. with less than 100 employees and included in surveys of producers;
5. "Very small firms", i.e. with less than 100 employees and not included in surveys of producers;
6. "Fiscal data", i.e. specific groups of self-employed estimated on the basis of fiscal data.

For each component plausible ranges of distortion by fraud are indicated. In this way a plausible upper bound for the distortion of GDP by fraud is derived. The conclusion was that for GDP-levels a distortion of more than 5% is very unlikely and that for GDP-growth rates a bias of more than 0,5% is very unlikely.

The second example pertains to *measurement errors in foreign trade statistics*. The existence of such errors is evident from comparing the mirror-statistics of countries, even of those with a good statistical reputation (see van Bergeijk, 1995, Bulletin of Economic Research). For example, comparing the bilateral trade statistics of Germany and the Netherlands indicates implicit minimal measurement errors of about 1,5-3%. This can also result in quite a different view of the bilateral trade. For example, the balance of Dutch-

German bilateral trade in 1987-89 turns into deficit according to German trade data, whereas the data published by the Netherlands show a persistent surplus.

What are the consequences of such measurement errors for the national accounts, e.g. the Domestic Product estimates? These consequences are not straightforward as they depend critically on the compilation methods used. An error in foreign trade statistics does influence Domestic Product when estimated from the expenditure side or when using commodity-flow methods. But such an error is irrelevant for Domestic Product when estimated from the production side, i.e. as the difference between output and intermediate consumption. The latter may imply that in balancing the accounts the error in foreign trade statistics is detected and corrected for in estimating imports and exports. Unfortunately it may also imply that the estimates of variables other than imports and exports are adjusted in order to balance the accounts, e.g. final consumption expenditure by households. So, errors in foreign trade statistics may spread all over the national accounts.

The third example refers to *capital consumption*. Gross Domestic Product is only influenced by measurement errors in capital consumption by the government (and non-profit institutions serving households). The generally more relevant concept Net Domestic Product is only influenced by measurement errors in capital consumption by market producers. Bos (1990) investigated the sensitivity of Dutch Domestic Product-statistics for different assumptions about the life-time of fixed assets. Taking half of the officially assumed life-times resulted in a 2.8% lower average value of Net Domestic Product during the period 1969-1988; the growth rate of NDP decreased with 0.1%point.

The fourth example refers to *errors in price measurement*, like not taking into account quality change (e.g. by the use of naïve volume-indicators for imports and exports, like the weight of a product), the introduction of new products, the use of outdated weighting schemes or the use of sub-optimal index formulae<sup>101</sup>. If prices-changes and values are estimated independently, errors in price measurement end up in the estimates of the volumes. However, if values are estimated by multiplying an estimate of price by an estimate of a volume, the errors in price measurement end up in the values and do not influence volumes. Furthermore, the consequences for prices, volumes and values of Domestic Product depend also on the specific location of the error. For example, a measurement error in the price-change of indirectly measured financial services does not influence the price of Domestic product, because the use of all these services are recorded as intermediate consumption. Similarly, measurement errors in the price change of computers influences different countries differently, as some countries are major producers and exporters of computers, while others only import computers.

The fifth example refers to *signalling new developments*. By looking at the national accounts data sources and compilation methods or by looking at successive national accounts estimates the signalling quality of national accounts statistics can be revealed. For example, if no (timely) data sources are available on the employment, sales and purchases of some services industries and no qualitative information is used, national accounts statistics will not signal any major change in these services industries.

A sensitivity analysis is a very important tool for assessing the reliability of national accounts statistics. Only in this way the consequences of errors in data sources or the absence of data sources can be properly investigated. The reason is that these consequences critically depend on the bookkeeping mechanisms in the national accounts and the compilation methods actually employed. For data users with a sound understanding of national accounts,

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<sup>101</sup> Bakker (1991) is an example of a sensitivity analysis for the choice of index number formulae and weights; Sensitivity analysis of Dutch macro-economic data for the interwar period show that different formulae and weights yield large differences in growth rates.

documentation of the operational model and compilation methods may be sufficient to draw qualitative inferences about the consequences of measurement errors in national accounts data sources. However, for most data users explicitly spelling out of the consequences of bookkeeping mechanisms and compilation methods and giving an estimate of the size of these consequences will be essential supplementary information.

*The universal and operational concepts as approximations of the true concepts*

From the point of view of a specific use of national accounts statistics, the underlying concepts could be regarded as approximations of the true concepts, i.e. of the theoretically perfect concepts for that type of use. As a consequence, conceptual imperfections could also be regarded as measurement errors. Such conceptual measurement errors can be very substantial and are also essential for assessing the reliability of national accounts statistics. Two examples may illustrate this.

Firstly, if Domestic Product is taken as a proxy of welfare, the measurement error is likely to be very big.

Secondly, gross figures on value added, Domestic Product and National Income are often preferred to net figures, because estimates of capital consumption are not considered to be sufficiently reliable or comparable. However, this argument overlooks the importance of the conceptual error, i.e. by preferring gross figures expenditure on capital formation are never regarded as intermediate inputs for the production process. As a consequence, productivity and income per capita of capital intensive industries and countries are overestimated vis-à-vis more labour intensive industries and countries (for a more extensive discussion, see Bos, 1992b).

Thirdly, changes in official national accounts statistics due to changes in concepts can also be regarded as measurement errors. The size of such measurement errors can be illustrated with figures from the Netherlands.

In the revision of 1999 the concepts of the new international guidelines (SNA93 and ESA95) were introduced (see Bos, 1994b and Buiten et al., 1994). This implied a substantial change in basic concepts. For example, the introduction of capital consumption on infrastructure increased government final consumption expenditure, Domestic Product and national income with 1.4% GDP. Recording expenditure on software and data bases as capital formation increased capital formation, capital consumption, Domestic Product and National Income with 0.8% GDP. Reinvested earnings on direct foreign investment are now included in the primary income flows with the rest of the world. As a consequence, Dutch national income increased with 1.3% GDP. A major shift occurred between final consumption expenditure by households and by the government. The latter included now also 8% GDP of social benefits in kind via market producers, like health care services financed by social security, rent allowances and free transport for students. Social security contributions were reduced with 1.2% GDP by excluding branch-specific social insurance, e.g. for civil servants.

European requirements on the harmonization of GNP-estimates also induced some substantial changes. The payments to people in social workplaces should be recorded as compensation of employees instead of social benefits. As a consequence, final consumption expenditure by the government, Domestic Product and national income increased with 0.6% GDP. The estimates for the imputed services of owner-occupied dwellings were also revised. This implied a reduction of final consumption expenditure by households, domestic product and national income of 1.3% GDP.

Following new EU-guidelines, in the revision of 2004 the recording of the services of the financial intermediation services indirectly measured (FISIM), i.e. the banking services financed via the interest margin, was modified. Instead of recording the use of all these services by convention as intermediate consumption, the use of the services should now be

allocated to the real users of these services following a new international method. As a consequence, final consumption expenditure by households increased with 1.2% GDP, government final consumption expenditure with 0.2% GDP and exports with 0.4% GDP. The total impact on GDP was therefore an increase of 1.8%.

## 7.5 Summary

The universal model can not be estimated directly. It should first be translated into an operational model for a specific country during a specific period of time. This involves interpretation of the universal model in view of the national economy and further specification of the concepts, detail and scope. The operational model decides to a substantial extent what is actually measured. Differences in national operational models are therefore a serious threat to international comparability. This applies in particular to the measurement of prices and volumes. A more specified universal model can partly solve this problem. However, even a more specified universal model can never serve as the operational model.

The operational model is estimated by combining very heterogeneous and incomplete sets of data; the latter include national accounts estimates for previous periods and frames of reference for grossing up and combining data, e.g. a business register or a population census. The major estimation tools are accounting identities, plausibility checks and assumptions.

Accounting identities are friends and foes of national accounts statistics. They ensure consistency, can act as plausibility check and allow residual estimates. However, they can also enforce to modify best estimates for the sake of consistency. Furthermore, all residual estimates are likely to be very unreliable, as they serve as the garbage bag for errors in all the other estimates.

Plausibility checks are very important for the reliability of national accounts statistics. They can weed out erratic developments in data sources (e.g. due to conceptual changes), can help in detecting all sorts of compilation errors and are important in making estimates during all various stages of the compilation process. What is regarded as plausible is ultimately decided by the compilers' skills in inventing plausibility checks, by the compilers' skills in finding plausible answers and by the compilers' personal knowledge and model of the national economy.

Assumptions are essential in combining and completing the basic set of data. The more encompassing, up-to-date, detailed, reliable and conceptually close the basic data set, the smaller the role played by assumptions can be. Plausible assumptions can remedy to a substantial extent the absence of data and are to be preferred to implausible data. However, when for substantial parts of the national economy no plausible data or assumptions are available, national accounts statistics transform into guesswork.

The estimation process is influenced by environmental factors like skills (e.g. skills in combining data and making plausible assumptions), resources (e.g. resources for compiling good price-statistics, for maintaining a reliable business register or for compiling national accounts statistics) and policy (e.g. a mixed strategy of continuity or a preference for prudence and stability).

Official national accounts statistics are generally the only and therefore the best available estimates of the multi-purpose universal model. However, their reliability can differ substantially internationally, over time and even within the same set of national accounts statistics. This is to a great extent the price to be paid for a very ambitious statistic. For example, complete estimates of national economies are to be made, while in all countries for some parts no reliable data (e.g. services industries or illegal production) are available. Furthermore, one universal model is to be estimated even though available data sources,

specific circumstances and resources for compiling economic statistics differ widely internationally.

National accounts estimates are not necessarily the best available national estimate of individual variables. Reasons can be e.g. a compilation policy stressing continuity, the allocation of resources and time for making specific estimates or the need for consistent estimates.

A major drawback of official national accounts statistics is that usually no information is provided about their operational concepts and reliability. This should be remedied by:

- Production and dissemination of statistics about differences in successive estimates;
- Documentation of the operational concepts;
- Documentation of data sources and compilation methods, e.g. including a table indicating the relative importance of good-quality data sources for the estimation of Domestic Product, a table showing which parts of the national economy are not covered by good-quality data sources and an overview of the assumptions, plausibility checks, balancing procedures and compilation policy.
- Sensitivity analysis about the consequences of various major types of measurement error.
- Sensitivity analysis about the consequences of alternative specifications of the operational model, e.g. the consequences of introducing hedonic prices for computers.
- Sensitivity analysis about the consequence of alternative specifications of the universal satellite, e.g. a welfare-oriented satellite on household income.

This approach has some similarity with the old habit of some statistical offices to publish margins of error. However, such margins of error are a too indirect, crude and subjective way to address the issues at stake. Furthermore, they do not explain the underlying logic and sources of errors and biases; also the –often quantitatively very important– conceptual issues are generally ignored.

## 8. THE RELEVANCE OF NATIONAL ACCOUNTS STATISTICS

*Use, misuse and proper use*

### 8.1 Introduction

In this chapter, the relevance of national accounts statistics and their underlying conceptual framework will be investigated for their four roles:

1. description and object of analysis (section 8.2);
2. tool for communication and decision-making (section 8.3);
3. input for alternative concepts and estimates (section 8.4).
4. tool for analysis and forecasting (section 8.5);

For each role, the merits and limitations of national accounts statistics are described and discussed. This indicates the potential relevance of national accounts statistics. However, national accounts statistics not used at all or not used in a proper way are not very relevant. So, the actual relevance of national accounts statistics depends also on their actual use and their proper use. This is therefore a central topic in all four sections. A summary is provided by section 8.6

For a systematic discussion, the various roles should be discussed in view of the various national accounts products. The potential supply of national accounts products is summarized in table 8.1a. Three basic products can be distinguished:

- National accounts concepts. This covers the universal model and the operational model.
- National accounts statistics. Four types can be distinguished: historical accounts, long term time-series, medium-term and annual statistics and short-terms statistics (e.g. quarterly accounts and monthly accounts).
- Forecasts based on national accounts concepts and starting from national accounts statistics. This covers short and medium term forecasts (looking one to five years forward) and long term forecasts (more than five years).

For all these national accounts products, the eight different perspectives discussed in chapter 6 are relevant. This gives a complete spectrum of the potential supply of national accounts products.

Not all national accounts products are relevant for all types of uses. For example, as a description, only statistics and forecasts are relevant; as an object of analysis, only statistics and not forecasts are relevant. However, for communication and decision-making and as a tool for analysis and forecasting, also the national accounts concepts are relevant. This is shown in table 8.1b and will be discussed in more detail in the subsequent sections.

The literature about the various uses of national accounts statistics is limited. Major exceptions are Kendrick (1972), SNA93, Vries (1993), UN (2002), Vanoli (2005) and Lequiller and Blades (2006). Distinctive features of this chapter are:

- national accounts statistics and their concepts are regarded as stocks of knowledge;
- discussion of the merits and limitations of bookkeeping explanations;
- national accounts statistics and their concepts are regarded as a tool of communication;
- the focus on misuse of national accounts statistics in practice<sup>102</sup>.

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<sup>102</sup> About misuse of the national accounts from a modelling perspective see also Richter (1994) and Holub and Tappeiner (1997).

Table 8.1a Supply of national accounts concepts, statistics and forecasts

	<i>Concepts</i>		<i>Statistics</i>				<i>Forecasts</i>	
	Universal model	Operational model	Historical accounts	Long term time-series	Medium term and annual statistics	Short-term statistics	Short term forecasts	Long term forecasts
<i>Perspectives of the national accounts</i>								
1 National economy	+	+	+	+	+	+	+	+
2 Non-financial corporations	+	+	+	+	+	+	+	+
3 Financial corporations	+	+	+	+	+	+	+	+
4 Government	+	+	+	+	+	+	+	+
5 Households	+	+	+	+	+	+	+	+
6 Relations with rest of the world	+	+	+	+	+	+	+	+
7 Industries and input-output	+	+	+	+	+	+	+	+
8 Other, e.g. regions, environment	+	+	+	+	+	+	+	+



Table 8.1b Uses of national accounts concepts, statistics and forecasts

	<i>Concepts</i>		<i>Statistics</i>				<i>Forecasts</i>	
	Universal model	Operational model	Historical accounts	Long term time-series	Medium term and annual statistics	Short-term statistics	Short term forecasts	Long term forecasts
<i>Types of use</i>								
1 Description and object of analysis								
a. Description			+	+	+	+	+	+
b. Object of analysis			+	+	+	+		
Tool for communication and decision-making								
2								
a. Explicit use	+	+	+	+	+	+	+	+
b. Implicit use	+	+	+	+	+	+	+	+
Input for alternative statistics, forecasts and concepts								
3								
a. Statistics and forecasts			+	+	+	+	+	+
b. Administrative concepts and rules	+	+						
c. Concepts for analysis	+	+						
4 Tool for analysis and forecasting	+	+						

## 8.2 Description and object of analysis

### *Merits and limitations as a description*

The national accounts provide a unique overview of national economies, their major groups of economic actors and the various economic flows, stocks and economic processes. National accounting concepts *give a concrete and specific meaning to the national economy and national accounts statistics show us the resulting facts.*

National accounts statistics are the overview-statistic on the national economy. As a consequence, they also serve as *frame of reference for specific statistics and administrative data sources.*

*No neutral description of economic reality* is given: the description is focused on what can be readily observed in monetary terms, it contains substantial transformations of what can be observed and is based on a specific way of labelling economic reality. Different choices would have resulted in a different picture of economic reality.

The national accounting concepts are based on *one universal model*. This contributes substantially to the quality, stability, neutrality and international comparability of their concepts. It is also essential for describing groups of national economies or showing links between different national economies. However, the national accounting concepts are also based on the national operational models. Substantial differences may exist in this respect, e.g. for prices and volumes. This is a serious danger for international comparability.

The universal model is a model of the national economy as a whole. However, it is in fact a *synthesis and compromise between eight different models*:

1. the national economy as a whole (economic growth, inflation, business cycles, income, expenditure and wealth per capita);
2. non-financial corporations (business accounts);
3. financial institutions (monetary policy);
4. government (budgetary policy, government finance);
5. households (personal income, wealth and consumption);
6. rest of the world (balance of payments);
7. industries (production, employment and input-output analysis);
8. and other (e.g. the environment, human capital and the welfare state).

Each model describes a different perspective of the national economy and each justifies some of the specific national accounting conventions. The universal model smartly combines these models in one accounting framework. As a consequence, the universal model presents overviews for each of these specific perspectives and can also show all kinds of interactions between them and with the national economy as a whole.

For some parts of the national economy, *competing overviews can exist*; these can be overviews purely for national purposes (administrative or statistical), but they may also be subject to international guidelines. Examples of competing overviews are the balance of payments by the central bank, an overview by the central bank on the financial position of the banking sector, an overview by the federal government of the revenues and expenditure of several layers of government or the consumer price indices published by statistical offices.

The merits of the specific overviews by the national accounts vis-à-vis purely national overviews are:

- the same concepts are applied for a long time;
- the same concepts are also applied by other countries;
- the overview can be more complete, as also units may be covered which are not directly supervised by the central bank or the federal government;
- the overview is presented in a macro-economic context, i.e. interactions with the rest of the national economy are also shown;

- assuming the competing overviews are used as inputs in compiling the national accounts statistics, the data are likely (but not necessarily) more reliable.

So, the specific national accounts overviews are likely to be more comparable over time, more internationally comparable, more complete, are embedded in a statistical overview of the national economy and are likely to be more reliable.

However, some of the major national administrative overviews (e.g. balance of payments and government finance statistics) have become more and more subject to international standardisation and these standards are more and more harmonised with those of the national accounts. As a consequence, the major differences with the national accounts are disappearing and all these overviews become part of a big statistical framework under the roof of the national accounts.

The fully *consistent and simultaneous description of eight perspectives has also clear disadvantages*. As a description for any specific perspective, the standard national accounts description contains an excessive number of accounts, is not very comprehensible and contains sub-optimal concepts. This can also be a disadvantage vis-à-vis competing national overviews. This disadvantage can be resolved by developing for all these perspectives supplementary concepts and tables. These supplementary concepts and tables can be derived by simply rearranging the basic standard national accounting concepts. The central framework then starts to serve as a flexible building-block system, like pieces of LEGO.

The universal model *does not aim to measure welfare* (see sections 3.4 and 6.2.2). As a consequence, it also does not ensure full international comparability in an analytic sense. Biases and limitations in the universal concepts have different implications for different countries. This depends on the specific institutional structure (e.g. differences in the importance of tax expenditure or non-tariff barriers or the distribution of tasks between the government and the market), the natural environment (e.g. differences in the climate), the demographic situation (e.g. differences in the age-structure of the population) and the economic importance of phenomena in a national economy (e.g. differences with respect to unpaid household services, hyper-inflation, computers). For example, ignoring the role of unpaid household services implies that by comparing Domestic Product per capita the living standards of developed countries are overestimated and those of developing countries are underestimated.

The universal model *does not contain any corrections for the influence of seasons, business cycle or incidental events*. However, for a proper interpretation of national accounts statistics such corrections are often essential, e.g. does the government deficit deteriorate due to the business cycle or due to changes in economic policy?

A core-set of national accounts statistics is available for nearly all countries in the world. However, the available national accounts may also differ enormously from one country to another in nearly all respects, e.g. scope, detail, timeliness, reliability, frequency, presentation and the presence of time-series. This reflects differences in available data, resources for compiling national accounts statistics, compilation skills and policy, e.g. differences in priority. Information on the reliability of national accounts statistics and the underlying operational concepts is generally not available.

#### *Object of analysis: the concepts*

The merits and limitations of national accounts statistics as a description give a first impression of national accounts statistics as an object of analysis. However, what is suitable for a description is not necessarily suitable as an object of analysis. Furthermore, in order to serve as an object of analysis also the implications of these merits and limitations should be well understood.

In order to describe the economic importance of a phenomenon, an estimate to a great extent based on assumptions may be useful. This can apply to e.g. the welfare costs of the congestion of traffic, the value of unpaid household services, the services of owner-occupied dwellings and the value of leisure time. However, in order to use the estimates of a phenomenon as an object of analysis assumptions should play a minor role. Otherwise, the assumptions themselves have become the object of analysis.

By leaving out quantitatively very big imputations, like the value of unpaid household services, the value of leisure time and the costs of traffic congestion, national accounts aggregates of product and income are not suited as indicators describing welfare. However, this is essential for safeguarding national accounts aggregates of product and income as objects of analysis.

Official national accounts statistics include various smaller imputations, like the services of owner-occupied dwellings. The implication is that these are not suited as objects of analysis. So, the development of the value and price of the services of owner-occupied dwellings should not be an object of analysis (only the volume can be an object of analysis). When a major part of the rental activities in a country consists of services of owner-occupied dwellings, this applies also to all rental activities. For bigger aggregates including the services of owner-occupied dwellings, like final consumption expenditure by households, the impact of the imputation can still be substantial. So, for a proper interpretation of the development of the value and price of final consumption expenditure by households, the impact of the services of owner-occupied dwellings should be isolated and shown separately.

More in general, in using national accounts statistics as an object of analysis the implications of the underlying concepts should be well understood. For example, for analysing the price of government final consumption expenditure knowledge of the underlying definition is essential. Broadly speaking, government final consumption expenditure is equal to intermediate consumption, consumption of fixed capital, compensation of employees minus sales<sup>103</sup>. It implies that the price change of government final consumption expenditure is a weighted average of the price change in these components. Furthermore, it implies that relatively fast price increases in government sales (e.g. garbage disposal fees, school fees and revenues for collecting import duties on behalf of the EU) reduce the price increase of government final consumption expenditure. Some other examples from the universal model are:

- final consumption expenditure by households exclude social security benefits in kind (e.g. health care financed via social security) and social assistance benefits in kind (e.g. rental financed via individual rent allowances);
- compensation of employees exclude wage subsidies and payments for people working via temporary agencies;
- gross fixed capital formation includes the sale of fixed assets (negative capital formation);
- gross capital formation excludes expenditure on education, training and Research & Development;
- using up the environment is not recorded as negative capital formation;
- the volume of health care services or education services is the volume of services delivered and does not indicate the outcome of these services, e.g. the health of the population is also affected by many other factors.
- economic growth excludes unpaid household services and (changes in) leisure time. For example, according to Landefeld and McCulla (2000, p. 304-305), the growth of post-war GDP in the United States has been overstated by ignoring household production.

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<sup>103</sup> Assuming subsidies received, taxes on production paid and own-account capital formation are relatively small compared to the other items.

- economic growth, productivity and final consumption are affected by recording some (former) final consumption expenditure as intermediate business expenditure. This partly explains the post-1973 productivity decline in OECD-countries. Some examples may illustrate the issue: 'Business' travel, entertainment expenses, company gyms, day-care centres, cars, pollution control, environmental preservation expenditure and improvements in workplace safety and amenities (see Diewert and Fox, 1999, p. 262).

Also the specific national operational model can be important, e.g. in explaining economic growth the operational definitions of prices and volumes can reveal what is actually to be explained.

*Object of analysis: lack of sufficient reliability and comparability*

Lack of sufficient reliability and comparability can also be a reason to ignore some national accounts statistics as an object of analysis. However, usually no information is provided about the reliability and comparability of national accounts statistics. As a consequence, only rather general impressions can be used to decide whether a specific national accounts statistics are sufficiently reliable for conducting some specific analysis. This will imply that in some instances national accounts statistics are not used, due to unwarranted distrust. In other instances, national accounts statistics are used as an object of analysis where it is not very meaningful. The fundamental lack of reliability can be due to e.g. the important role of assumptions in constructing these data (like the use of a specific function or fixed ratio) or because it concerns estimation as a residual and its development over time is therefore likely to be full of errors.

Information on the reliability and compilation methods is not only important for deciding whether or not to use national accounts statistics as an object of analysis. It is also important in order to choose the best method of analysis and to draw the right conclusions. Some examples may illustrate this.

A common assumption in time series analysis is that all observations are equally reliable (i.e. are subject to the same measurement error). However, for national accounts statistics this often does not apply. For example, in compiling historical annual time series (e.g. for 1870-1960) often first relatively detailed estimates are made of some benchmark years (e.g. 1870, 1900, 1915, 1930, 1940, 1950 and 1960), which are then interpolated in order to complete the time series. Estimation of a regression model on the basis of the annual growth rates is then not the best method. It is better to regard the volume change in each period between benchmark years (1870-1900, 1900-1915, 1915-1930, 1930-1940, 1940-1950, 1950-1960) instead of the annual growth rates as primary (blocks of) observations. Furthermore, it is likely that the estimates for some of these periods are more reliable than others, e.g. periods including major wars are likely to encounter more data problems.

Similarly, constructing quarterly time series mainly on the basis of annual time series seems very attractive for econometric analysis as it drastically increases the number of observations. In several countries this has actually been a research project. However, it is generally misleading. When the quarterly national accounts statistics are constructed by the use of an explicit seasonal pattern actually no observations have been added. When the quarterly national accounts statistics are constructed with the aid of some real data, the estimation method should still take account of the way these data have been constructed, e.g. treat the annual growth rates as the primary observations and the quarterly growth rates of four quarters as the secondary observations (with a lower degree of reliability attached).

A common assumption in time series analysis is also that the measurement errors of the observations are independent. However, for national accounts statistics this often does not apply. For example, when the volume change is estimated as the value change deflated by the price change, measurement errors in the volume change will reflect measurement errors in

price change. Similarly, when domestic product is estimated by the expenditure approach, domestic product figures will reflect measurement errors in imports and exports.

In compiling national accounts statistics various assumptions are used, e.g. fixed ratios or a productivity increase for the government of 1% per year (see section 7.3). When these assumptions are unknown to the data user, assumptions are mistaken for observations, e.g. in estimating an econometric model or in validating a hypothesis.

Measurement errors in Domestic product figures can directly affect the conclusions of growth accounting. For example, alternative estimates of Chinese Domestic Product since the 1978 reforms indicate lower growth rates. *Ceteris paribus* this implies a much more limited role of technological progress. This favours the view that China's economic development since 1978 has been almost entirely dependent on factor inputs (Wu, 2000).

The availability of national accounts statistics can also influence the structure of econometric models. For example, in the Netherlands, the absence of statistics on capital stock stimulated the successful application of the clay-clay vintage production function in the models of the CPB (see Verbruggen, 1993, p. 157-158).

The lack of reliability and comparability could be overcome by making alternative or supplementary estimates, e.g. for remedying inconsistencies between national accounts output and employment data or for overcoming differences and imperfections in the price indices for ICT capital goods (see section 4.2).

### 8.3 Tool for communication and decision-making

A major role of national accounts statistics is also to serve as a tool for communication and decision-making. This role is discussed in this section.

National accounts statistics provide a coherent set of concepts and facts about national economies all over the world. They serve as the empirical frame of reference for thinking and communicating about national economies and its major components. This pertains to a wide range of private and public actors, e.g. households, enterprises, non-profit organisations, various layers of government, international organisations, economists, journalists, trade-unions etc. They all think and communicate in terms of national accounting concepts, like economic growth, final consumption expenditure by households, capital formation, government deficit, taxes and the current external position with the Rest of the World. Forecasts of national accounts statistics are also available all over the world. The monopolistic position of national accounts statistics and their world-wide use and acceptance reinforce this role as universal facts and language. In this way, national accounts statistics and their underlying concepts shape and modify the general perceptions about the national economy and how it works.

Decision-making is affected by national accounts statistics. This can be indirect by shaping our general perceptions about the performance of the national economy and how it works. However, it is often also quite direct. Decision-making is often even formulated in terms of national accounts statistics or official forecasts of them.

#### *Explicit use of national accounts statistics in decision-making*

Four types of explicit use are very common:

1. Frame of reference for decisions on investment, consumption and wages;
2. Target of public policy;
3. Tax or aid measure for nations and regions;
4. Automatic adjustment for price changes.

National accounts statistics are often explicitly included in the *decision-making on investment, consumption and wages*. Statistics on the absolute and relative growth of national economies are used as an indicator of financial strength and economic performance. As a consequence, they can influence e.g. foreign direct investments, the purchase and sale of equity and currencies and the granting and conditions of international loans. These changes can then influence many other variables, like exchange rates, interest rates, consumer prices and imports and exports. National accounts statistics indicating poor economic growth can also cause governments to lose elections. Wage negotiations by trade unions can be partly based on forecasts of the macro-economic productivity increase according to the national accounts. Negotiations on big investments projects (e.g. planes, dwellings and infrastructure) can be partly based on forecasts and statistics of economic growth, capital formation, wage increases and the general change in prices.

National accounts statistics as a *target of policy* includes e.g.:

- The supply of money should grow in line with the nominal growth of Domestic Product corrected for changes in the velocity of circulation (monetary policy target in order to avoid excessive inflation);
- The government deficit should not exceed 3% of National income (entrance-criterion for the European monetary union);
- Economic growth should be high and stable (under some restrictions);
- The government expenditure on education as a percentage of Domestic Product should increase to 5%.
- Expenditure on Research and Development as a percentage of Domestic Product should increase to 3%.
- Development aid should be at least 0,7% of National income (international norm of development aid).
- Government expenditure should not exceed 60% of Domestic Product (an old target in the Netherlands, i.e. the “Bert de Vries-norm”).
- All EU-countries should fairly contribute to European military expenditure, i.e. military expenditure as a percentage of Domestic product should not deviate too much among EU-member states.
- The burden of taxes and social security contributions as a percentage of National Income should be reduced with 5%point during the next four years.
- The European budget for stimulating Research and Development should grow in line with the average nominal growth of European National Income.

For some of these targets, it is essential to have very timely national accounts statistics (/reliable forecasts), e.g. for monetary and budgetary policy. For most other targets, timeliness is less relevant.

*National accounts statistics as a tax or aid measure* includes e.g.:

- the contributions to the international organisations like UN, OECD and IMF and to supra-national economic and political unions, like the EU. These contributions are generally based on National Income-figures.
- Development aid should be 1% of National income (national policy on development aid)
- Development aid is only provided to the 20 countries with the lowest Domestic product per capita (national policy on aid).
- Regions with a relatively low Regional product per capita receive funds from the European Structural Funds.

*Price-indexes from the national accounts* can also serve as an automatic adjustment for price changes. Examples from the Netherlands are:

- Real expenditure ceilings for the budget of the state government are adjusted with the price-change in Domestic Product;

- Multi-annual agreements on capital expenditure by the state, e.g. on defence and infrastructure, are adjusted with the price change in capital formation by the government; agreements on current expenditure on goods and services are adjusted with the price change in net material consumption by the government.
- Multi-annual contracts by local authorities and non-profit institutions are adjusted with the price change in net material consumption by the government and of wages and salaries by the government. These contracts could pertain to e.g. the rents of school-buildings and sport accommodation and the levies of polder-boards.
- The budget by local authorities and non-profit institutions can be determined by using for the various types of expenditure and for some sales and tariffs indices from the national accounts.

#### *Merits and limitations as a tool for communication and decision-making*

These uses of the national accounts demonstrate its clear *merits* as a tool for communication and private and public decision-making:

- National accounts statistics provide new opportunities for decision-making due to their unique focus (a coherent set of macro- and meso-economic aggregates), their universal model (which makes it relatively independent to national political pressure), their universal availability (including forecasts) and their compilation by often politically independent institutes (e.g. a national statistical institute).
- Due to national accounts statistics, decision-making need not be based on fragmentary, inconsistent, incomparable and often subjective information about macro- and meso-economic developments.
- Due to national accounts statistics, targets of policy can be linked explicitly to macro- and meso-economic developments and can be monitored and agreed upon internationally.
- Due to national accounts statistics, contributions by countries or aid to countries can be based on universal standards of economic performance and financial strength.
- Due to national accounts statistics, many agreements and contracts can be adjusted for price-changes in a much more meaningful way, e.g. in comparison to using a CPI.

National accounts statistics also have clear *limitations* as a tool for communication and decision-making, e.g.:

- No neutral description of economic reality is given;
- The underlying concepts seem incomprehensible as the relationship with specific uses is generally not explained.
- The reliability, comparability and availability of national accounts statistics may have clear limits;
- Specific events and institutional changes can have unintended consequences;
- Information about the operational concepts and about reliability is generally absent.

#### *Disregarding limitations?*

Considering the unique merits of official national accounts statistics, disregarding these limitations may seem beneficial for communication and decision-making. For example, one could reason: “why bother about the best concepts for a specific purpose: all concepts have some drawback and for most decisions the exact concepts do not matter”. Similarly, why bother about reliability: national accounts statistics will always have substantial margins of unreliability and they are sufficiently reliable to indicate trends and the relative size of national economies. Furthermore, quarrelling about national accounts statistics simply amounts to reducing its unique role as a widely accepted tool for communication and decision-making without providing any viable alternative.



However, disregarding these limitations will frustrate efforts to overcome or better deal with these limitations, e.g. by developing standard concepts for major specific purposes, by improving comparability or by disclosing information about reliability. Furthermore, it will cause miscommunication, badly informed decision-making and decision-making based on sub-optimal concepts. Some examples may illustrate this.

A common argument in the Netherlands is that work pressure is relatively high because Dutch Domestic Product per hour worked is relatively high. The high work-pressure is then used to explain (defend) the high number of people receiving disablement insurance (WAO). However, this is a non-sense argument, as working hard is only one of the many possible explanations for a high value added per hour worked.

Domestic Product or National Income per capita are often regarded as indicators of welfare, e.g. by a Dutch Minister for Economic Affairs. He argued that increasing the labour participation of women is important for increasing Dutch welfare, e.g. vis-à-vis the USA, and for financing the Dutch welfare state. However, a lower Domestic Product per capita in the Netherlands than in the USA need not indicate lower welfare. For example, the number of hours worked per capita is much lower in the Netherlands, while the economic importance of unpaid household services is much higher. Domestic Product per capita is much more suited as an indicator of the possibility to finance the welfare state, i.e. how much tax and social contributions can be raised. The Dutch Minister should therefore only have argued that increasing the labour participation of women is important for financing the welfare state.

National Income is used as a measure to tax countries. The economic importance of unpaid household services like cooking, caring and cleaning is unevenly spread over countries, e.g. it is relatively important in developing countries and it is in some developed countries (e.g. Netherlands) much more important than in other developed countries (e.g. France, Sweden, the USA). From a welfare point of view this implies that the fixed tax rates on National Income are actually progressive taxes (developed countries pay relatively more) and that developed countries with a relatively low labour participation of women pay less than other developed countries. The latter is probably an unintended consequence of using national accounts statistics.

A similar argument can be applied to other biases. For example, the use of gross national income generally amounts to taxing capital intensive countries more than capital extensive countries (see Bos 1992b). Similarly, national income does not include corrections for damage due to war and natural disasters. Using national income as a tax measure may therefore seem unfair for countries heavily hit by war and natural disasters.

The former *MPS69-measures of economic growth* stressed the importance of manufacturing and ignored the importance of various types of paid services. This can have stimulated the misallocation of resources and have played a crucial role in the bad economic performance of communist countries. Similarly, using the volume growth of Domestic Product as a strict target for policy can harm the welfare and the economic performance of a country. For example, aiming at maximising this measure of economic growth can amount to accepting enormous negative spill-over, e.g. pollution, congestion, exhaustion of natural resources, bad working conditions and very limited leisure time.

The *EMU-targets of government deficit and debt* may also have harmed welfare and the optimal allocation of resources. For example, government deficit can be reduced for many years by leasing instead of buying new fixed assets, like buildings, planes, cars and computers. An alternative strategy is to substitute income transfers and investment grants by loans at non-market interest rates. Similarly, government deficit can be reduced by decreasing interest payments only in nominal terms. This was the Italian strategy in meeting the EMU-target of government deficit: by a monetary policy reducing inflation to zero, nominal interest payments can be reduced to the level of the real interest payments (Modigliani, 2001, p. 230-

233). This strategy is in particular relevant for a country with enormous government debt, corresponding interest payments and inflation substantially above zero. Furthermore, the target of gross debt can be met by selling and leasing back fixed assets, by selling the equity of government corporations, by reducing the loans between the various layers of government (e.g. the state government starts to serve as the bank for social security funds and local authorities) and by reducing the loans to third parties, e.g. students and government corporations. These are all unintended consequences of the EMU-targets.

Like all price indices, national accounts price indexes can have problems in taking into account all kinds of quality improvements. This implies that price changes have a tendency to be overstated, as they partly reflect quality improvements. As a consequence, price changes used for decision-making and price compensation are too high. The mirror-image of this measurement error is likely to be too low volume changes.

The European structural funds are allocated to regions that have a low regional domestic product per capita. The latter concept is an example of inconsistency between numerator and denominator. Regional domestic product refers to the value added created by production in the region. Regional domestic product per capita can be very low in a region where a substantial part of the inhabitants work outside the region. This occurs for example in the Dutch region Flevoland, where many inhabitants work in Amsterdam. As a consequence, this not very poor region was granted a substantial amount of money from the European Structural Funds for restructuring and stimulating its economy.

#### *Should GDP be replaced by more welfare oriented measures?*

There is a world-wide anti-GDP and anti-growth lobby. They propose to abolish GDP in order to reduce misinformation of politicians and citizens<sup>104</sup>, to replace it by more welfare oriented measures (e.g. a human development index) or to stop maximizing GDP growth and replace it by a zero growth strategy. We do not think that any of these proposals would improve welfare; in general they would reduce welfare.

GDP per capita should be regarded as a measure of average material well-being. It is not a measure of welfare. Its limitations as a measure of welfare are in many respects similar to that of individual or household money income (/purchasing power/living standard) as a measure of welfare; in addition, there are issues like inequality and externalities. This is generally well understood by politicians and citizens. There is no major information failure inducing the seeking of unconditional economic growth. This is evidenced by:

- When GDP per capita grows and countries get richer, they become generally more willing to pay for reducing all kinds of negative externalities (pollution, inequality) and to increase leisure time.
- Elections are not only won on the basis of economic issues, but also on the basis of many other issues (e.g. abortion, safety, immigration, inequality, environmental problems and health care).
- In the Netherlands, taxes are high in order to redistribute income, leisure time for workers is very substantial and the construction of some roads is obstructed for decades in order to save beautiful natural environments and unique animals or to avoid extra noise for people living nearby. High taxes, much leisure time and not building roads important for quick transport are clearly bad for economic growth as measured by GDP.
- In the Netherlands, political parties ask the independent Netherlands Bureau for Economic Policy Analysis (CPB) to analyse the economic consequences of policy platforms not only in terms of GDP, but also in terms of consequences on purchasing power of various groups of households, employment and unemployment, public finance and environmental

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<sup>104</sup> This is proposed by the prominent Dutch environmental economist van den Bergh (2008).

themes. This exercise reveals also the trade-offs between the various policy goals. The Green Party is happy to sacrifice some economic growth for a better environment. Left wing parties are happy to sacrifice some economic growth for more purchasing power for the low-income groups. Right wing parties have a stronger preference for economic growth, but are still in favour of a substantial amount of redistribution of income.

GDP serves many important purposes that will be much less served when GDP is abolished or replaced by more welfare oriented measures, e.g. monetary and fiscal policy. Reducing the quality of monetary and fiscal policy will be bad for welfare. Using an alternative indicator like the Human Development index for determining contributions to the UN and other international organisations is also not straightforward: is this fairer than using GDP? Using an alternative indicator is also not likely to improve democracy: politicians and citizens have different preferences on different policy goals. Providing good information on all these different policy goals and their possible trade-offs is then required. Using only a single welfare-oriented indicator for comparing policy platforms would be regarded by politicians and citizens as misinformation and a type of dictatorship by benevolent economists.

On request of his readers, the Dutch economic journalist Frank Kalshoven<sup>105</sup> gives also five arguments why a zero-growth strategy would not be feasible and why aiming at at least a small economic growth per capita is required:

- The current living standard is based on the incentives of capitalism, i.e. high profits and earnings in case of successful entrepreneurship and innovation. A zero-growth strategy could kill the goose that lays the golden eggs, i.e. pose a threat to these incentives and therefore endanger our current living standard.
- Due to business cycle effects, a long term zero-growth rate would imply about half of the time a reduction in the standard of living. This seems politically not feasible.
- If other countries do not adopt a zero-growth strategy, this would imply a permanent fall in relative material well-being. This seems also politically not feasible.
- Uncertainty about structural economic growth, will imply that positive growth is required to ensure with some certainty long term zero growth.
- Zero-growth may not be a problem for the richest half of the population. However, if one wants to improve the living standard in absolute terms of the poorest 25%, then also some growth is required.

## 8.4 Input for alternative statistics, forecasts and concepts

Official national accounts statistics can also be *supplemented by non-official national accounts* statistics. Universal examples are the Penn-series on purchasing power parities and the historical time series by Angus Maddison (see section 4.2). An example from the Netherlands are national accounts statistics on government expenditure. By the Netherlands Bureau for Economic Policy Analysis (CPB), these statistics in current prices are allocated to functions and translated into price and volume-changes per year (see also section 8.5). These data sets serve data needs not (sufficiently) served by the official national accounts statistics.

National accounts statistics can also serve as an input for *really alternative estimates*, like welfare-oriented measures of national income, green national income, generational accounts and cost-benefit analysis. From this point of view, national accounts statistics are a very cheap, well-designed, universal semi-manufactured product. Of course, all these uses

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<sup>105</sup> Various columns in the Dutch journal: de Volkskrant 2008.

require a proper understanding of the logic, merits and limitations of national accounts statistics. Some of these alternative estimates, like welfare-oriented measures of national income and green national income, are intended to overcome the conceptual limitations of the standard national accounts.

National accounts statistics can also serve as an explicit *conceptual frame of reference for alternative accounts, budgetary rules and policy targets*. Examples are:

- The accounts of the state or local government can be influenced by national accounting concepts, e.g. by adopting the same concept of capital formation, by ignoring the opportunity costs of financing investments or by fully adopting the national accounts' classification and definitions of economic transactions. In the Netherlands, there are plans to adopt the national accounting concepts of economic transactions (e.g. compensation of employees, intermediate consumption, capital formation, sales and taxes) for the accounts of municipalities. This would increase national and international comparability of such data, would limit the possibilities of "creative" accounting and would improve the link with the macro-economic perspective on government finance, i.e. with the national accounts and the norms applied for the European Monetary Union (see Bos, 1991 and Tongeren and Keuning, 2002). In some other countries, e.g. France, the accounts of the various government bodies are already based on national accounting concepts.
- The real expenditure ceiling of the Dutch State government includes most expenditure on a cash basis, but interest is defined on an accrual basis in accordance with the universal national accounting concepts. In this way, reducing interest payments on a cash basis by issuing deep-discounted bonds does not change the margin for state government expenditure.
- In the Netherlands, the official government measure of micro-tax burden is influenced by national accounting concepts, e.g. by adopting the same delimitation of taxes versus sales by the government.
- The national regulation for business accounts can be inspired by national accounting concepts. This is the case in France. As a consequence, targets like profit and rate of return can also be influenced by the national accounts.

By serving as a conceptual framework for other purposes, private and public decision-making will be more based on one consistent set of concepts, i.e. those of the national accounts. As a consequence, time and efforts are saved in defining and deciding about the non-national accounting concepts, links with the national accounts are improved and decisions based on both sets of information will be more consistent.

A drawback can be that sub-optimal concepts are used. For example, ignoring in the government accounts the opportunity costs of financing investments understates the costs of infrastructure and defence. Similarly, not recording expenditure on education in the government accounts as capital formation, may underscore the importance of education for the national economy in general and for economic growth in the long run particular. With tight government budgets and a drastic increasing demand for education, this can lead to too low investments in education.

## 8.5 Tool for analysis and forecasting

National accounts statistics have five major merits as a tool for analysis and forecasting:

1. The universal model is a stock of knowledge of applied economic analysis;
2. National accounts statistics and their underlying operational model are a stock of knowledge of the specific national institutional and economic structure.

3. The compilation process is based on a stock of knowledge and skills how to make the best estimates with the specific national data sources.
4. The concepts and data are consistent;
5. A core set of data is readily available nationally and internationally.

The latter three merits are rather evident. However, the universal and operational models as stocks of knowledge need some further clarification.

The universal national accounting model is not only designed to estimate and present a set of facts. It is also a tool designed to help explaining these facts. These explanations make use of the economic, bookkeeping and institutional relationships described by the national accounts and explicitly take account of the economic importance (size) of the various actors and phenomena. Two examples may illustrate this: explaining GDP-volume growth and explaining the development of government deficit.

#### *Bookkeeping explanations of GDP-volume growth*

The volume growth of GDP can be explained following the three basic approaches in estimating GDP: the production method, the expenditure method and the income method.

The production method explains GDP volume growth in terms of the difference between volume growth of output and the volume growth of intermediate consumption in the various industries (or institutional sectors). This explanation of GDP volume growth can be easily elaborated on the basis of the supply and use table, e.g. the volume growth of output in a specific industry can be explained in terms the volume growth of the various ways of final and intermediate use of this output.

The expenditure method explains GDP volume growth in terms of the various final expenditure categories (capital formation, final consumption by households, final consumption by the government, exports and imports). This explanation can also be easily refined and elaborated. For example,

- the volume growth of final consumption by households can be explained in terms the volume growth the various product-groups involved;
- the volume growth of final consumption by households can also be explained by a link with income and wealth, e.g. changes in the real disposable income of households and real holding gains.

The income method explains GDP volume growth in terms of the contributions of the various categories of value added (compensation of employees, net taxes on production, mixed income, operating surplus) and the underlying factors of production (labour and capital). This is the growth accounting approach developed by Denison. However, this approach requires some further transformation of national accounts statistics, e.g. the splitting of mixed income into a compensation for labour inputs and a compensation for capital inputs.

#### *Bookkeeping explanations of government deficit*

The development of government deficit can be explained in terms of changes in the various government revenue and expenditure, but can also be first explained in terms of the government deficits of the various layers of government (central, state, local and social security funds). Each category of revenue and expenditure can then be explained further by exploiting the accounting framework, e.g.:

- the development of total taxes can be explained in terms of the development of the various types of taxes;
- the development of specific types of taxes can be explained in terms of the development of the tax base and the tariffs, e.g. excise duties on beer rise due to increased sales of beer and a higher tariff.

- the development of compensation of employees can be explained in terms of a change in the volume of labour and the average salary for the whole sector government, but also for the various industries in which the government is active (e.g. public administration, defence and education).
- the development of interest payments can be explained in terms of government debt and interest rates;
- the development of government debt can be explained in terms of the government deficit, differences between cash and accrual (e.g. for taxes and social contributions) and the net purchase of financial assets.
- The developments of social benefits can be explained in terms of various types of social benefits; this can then be further explained in terms of the number of social benefits and the average benefit<sup>106</sup>. The number of social benefits can then be explained in terms of changes in the labour supply and demand (i.e. employment in the national accounts).

The universal model can also be used to analyse or forecast the consequences of specific events. For example, the consequences of a change in the prices of oil or a general wage increase can be calculated on the basis of input-output tables.

#### *The universal model as a stock of knowledge*

The universal model reflects some very successful traditions of applied economic science. It is in fact a stock of knowledge about the best way to define and classify the national economy for economic analysis. It has many merits as a tool of analysis:

- It combines in one model many different perspectives on the national economy.
- It contains bookkeeping identities and classifications that are useful for understanding economic and institutional relationships all over the world.
- It contains several different levels of aggregations. As a consequence, it can clarify and explain the development of aggregates by showing the developments at a less aggregate level.
- It contains also many specific conventions considered to be for many purposes satisfactory solutions to old standing conceptual problems, e.g. about the production boundary, the asset boundary, the valuation of government output, the valuation of insurance and banking services and the treatment of reinvested earnings on direct foreign investments.
- Employing the identities and conventions from the universal model are a safeguard for proper reasoning.
- It contains definitions that reflect modern national economies, e.g. the treatment of zero-coupon bonds and the distinction between operational lease and financial lease are explicitly discussed.
- It is based on a relatively elaborate, accurate and consistent set of definitions, e.g. what is economic growth, what is the government, what is capital formation and what are subsidies. The national accounts definitions clearly indicate what is included and what is not included in a specific concept. These accurate definitions can not only help to understand what we want to explain, but also how it should be explained.
- It is a flexible tool, as its concepts and classifications can be combined and rearranged to formulated alternatives more relevant for a specific purpose (see chapter 6, in particular section 6.9).

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<sup>106</sup> A distinction between volumes and average social benefit is absent in the international guidelines on national accounting. This part of the bookkeeping explanation of government deficit has therefore no counterpart in the universal model.

These merits indicate that the universal model is not only useful for quantitative economic analysis, but can also serve as a source of inspiration for qualitative, more theoretic, economic analysis.

*The operational model and the compilation process as stocks of knowledge*

The *operational model* reflects a stock of knowledge of the specific national institutional and economic structure and how to describe these into operational concepts. For example, the operational model contains knowledge about which taxes exist in a country, which are taxes on products, which are other taxes on production, which are current taxes on income and wealth and which are capital taxes and how is the borderline drawn with alternative concepts, e.g. sales by the government.

National accounts statistics incorporate also the consequences of specific institutional changes and events. For a proper explanation and interpretation of national accounts statistics, it is in particular important to know the impact of major institutional changes (e.g. a reorganisation of the social security or tax system) and major specific events (e.g. strikes, reduction of the workweek in some industries, earthquake, the sale of telecommunication frequencies, a rise in the general VAT-rate) on national accounts statistics. Quantifying their impact should be part of compiling national accounts statistics, as it amounts to verifying the plausibility of the estimates (see section 7.3). Describing major institutional changes and specific events and quantifying their impact on the national economy should also be part of presenting national accounts statistics.

*Detailed tables* on the various transfers received and paid by the government can play an important role in this. These tables can show for each type of transaction (e.g. taxes, social contributions, social benefits, subsidies, capital transfers) the composition by national scheme, regulation, law or specific purpose (e.g. wages subsidies, subsidies for public transport and a subsidy to compensate for the damage of pig fever). Combining these detailed tables with the aggregate national accounts tables provides already much information of the impact of institutional changes and specific events, e.g. on government deficit and household income. However, such detailed tables on government transfers only show net changes and do not provide information on the underlying causes of these changes, e.g. changes in tariffs, changes in the tax base or the substitution of a subsidy or social benefit by tax expenditure.

Official national accounts statistics should therefore preferably be accommodated by a booklet explaining the developments in the national economy in terms of national accounts statistics and including the impact of major institutional changes and specific events. Only in this way a proper interpretation of national accounts statistics can be ensured, e.g. only in this way a data user can distinguish between trends, business cycle-effects and the consequences of major institutional changes and specific events.

The merits of national accounts statistics as a tool for analysis and forecasting are evidenced by the statements of an eminent data user:

“At times, I have been tempted to build an econometric model out of the primary data that feed into the national income and product accounts (F.B.: NIPA), to link retail sales to payroll employment, plant and equipment to publicly reported returns, sales surveys, and capital costs, and measures of markets and output derived from industrial data. But even with its limitations the NIPA data set adds so much through its logic, consistency, and data interpretation that it is still preferable to use it as the organizing principle of the analysis” (Otto Eckstein, 1983, p. 315)

*Limitations as a tool for analysis and forecasting*

However, national accounts statistics have also five major limitations for explaining national accounts statistics and for analysis and forecasting in general.

Firstly, the *variables used are too limited in view of economic theory*, e.g. they exclude the impact of human capital, unpaid household services, expectations, uncertainty, adverse selection, moral hazard, changes in replacement rate, potential growth, natural rate of unemployment (NAIRU) and do not have a clear micro-economic underpinning. As a tool for analysis and forecasting, national accounts statistics and its underlying model are therefore often used in combination with other models and data.

Secondly, *no behavioural relationships* are explicitly specified, e.g. what are the causal relationships, what is the functional form, what are the time-lags and what are the parameters.

Thirdly, *information about the reliability of national accounts statistics and the operational concepts is generally not available* (see section 8.2).

Fourthly, in order to keep a model balanced and neat and tidy, *a lot of information from national accounts statistics should be ignored or combined*<sup>107</sup>.

What to include and what to leave out for a specific type of analysis for a specific country is not always straightforward. For example, should a model explicitly show that part of government output is sold and that part of these sales are to households, e.g. school fees and garbage disposal fees? For showing the consequences of raising school fees on final consumption expenditure by households this is of course essential. For analysing the development of final consumption expenditure by households over time this can be important, but it may also be a secondary issue which can be abstracted from. Similarly, for an analysis combining information from the input-output tables and the sector accounts, how much effort should be spend on specifying the exact link between industries and institutional sector accounts, e.g. should the government sector and the financial intermediation sector be broadly equated to the sum of some industries?

A fifth limitation of the national accounts as a tool for analysis and forecasting is that the *standard national accounting concepts should preferably be rearranged or supplemented* in a specific way. Two examples from the user practice at the Dutch Centre for Economic Policy Analysis may illustrate the importance of this flexible use.

For analysing *labour costs* and their interaction with the labour market, the standard national accounting concept compensation of employees is not suited, as it ignores taxes and subsidies on wages. This can be resolved easily by formulating the concept labour cost in terms of standard national accounting concepts, i.e. as compensation of employees plus wage taxes minus wage subsidies. A requirement for this flexible use is of course that the national accounts statistics show separately wage taxes and subsidies (by industry or institutional sector). Such flexible use is not possible when they are an implicit part of taxes on production or subsidies on production.

The standard national accounts shows *government expenditure* by type of expenditure and by function only in current prices. It does not shed any light on the roles played by prices and volumes. It is therefore not well suited for understanding and explaining changes in the size and composition of government expenditure. The bookkeeping explanation of the government deficit presented above was in fact already making use of price- and volume-changes pertaining to government expenditure. By taking two supplementary steps, a simple overview of the development of prices and volumes of government expenditure vis-à-vis the price- and volume change in Domestic Product can be obtained.

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<sup>107</sup> The satellites in section 6.9, in particular the satellite for policy analysis, illustrate this too.



Firstly, all government expenditure is deflated by the price change in Domestic Product (or National Income). In this way, a deflated set of government expenditure (“real government expenditure”) can be compared for different types of expenditure /functions and with the volume change of Domestic Product.

Secondly, for some types of government expenditure specific price changes are available within the national accounts (e.g. compensation of employees, intermediate consumption, capital formation), outside the national accounts (e.g. some social benefits) or can simply be obtained from existing information (e.g. the price of interest can be approximated by the total amount of interest payments divided by the average government debt). These specific price changes vis-à-vis the price change in Domestic Product could be labelled as *the “exchange rate of government expenditure”*. By deflating the real changes in government expenditure with the change in this exchange rate, volume changes of government expenditure are obtained. These two supplementary steps decompose changes in government expenditure into the price change of Domestic Product, the relative price change vis-à-vis the price change of Domestic Product and changes in the volume and to compare them by type of expenditure or function. In this way, a simple framework is developed for bookkeeping explanations about government expenditure and as a frame of reference for more sophisticated analyses and stories.

#### *Dangers of not using national accounts statistics and concepts*

Ignoring national accounts statistics as a tool for analysis and forecasting can result in conceptual and statistical pitfalls.

For example, a productivity figure on manufacturing calculated on the basis of a national accounts statistic on output or value added and an other statistic on the volume of labour can be very misleading, as the units covered and the frame of reference for grossing up surveys can in practice differ substantially.

Similarly, final consumption expenditure by households according to the national accounts should not be explained by changes in the national CPI, as the scope, concepts and measurement methods are substantially different. For example, some consumer taxes like a tax for owning a car are not part of the price of final consumption in the national accounts, but are generally included in the CPI (see section 6.6).

Furthermore, the impact of government policy on government deficit figures according to the national accounts can only be analysed or forecasted when the concepts underlying government deficit are well understood. For example, financial transactions like the sale of equity in government enterprises or loans to students and specific companies are irrelevant for government deficit. Finally, the impact of social benefits on households final consumption expenditure and individual consumption depends on whether they are provided in kind or not: social benefits in kind are by definition all spend on goods and services, while social benefits in cash can also be used for saving by households.

## **8.6 Summary**

National accounts statistics are important for economic policy and analysis. Four different roles are played by national accounts statistics:

1. Description and object of analysis;
2. Tool for analysis and forecasting;
3. Tool for communication and decision-making;
4. Input for alternative accounts, budgetary rules and estimates.

As a *description and object of analysis*, national accounts statistics are unique. They define and measure the national economy and its major components. They make the sizes and developments in national economies all over the world visible and put them into quantitative terms. As a consequence, the world economy, the national economies and their major components can be monitored and analysed.

*Not all descriptions are suited as an object of analysis.* National accounts statistics are partly built on assumptions. Assumptions are essential in combining and completing the basic set of data. Plausible assumptions are even to be preferred above unreliable data. The more encompassing, up-to-date, detailed and reliable the basic data set, the smaller the role played by assumptions can be. By changing the definitions of the universal model, the role of assumptions can be increased or decreased further. For example, by enlarging the production boundary with unpaid household services, the role of assumptions is increased. As a consequence, national accounts statistics based on such an enlarged production boundary are less suited as an object of analysis.

Using national accounts statistics as an object of analysis requires knowledge about their meaning, reliability and interpretation. Knowledge of the underlying concepts, the measurement process and the specific national circumstances is therefore essential.

As a *tool for analysis and forecasting*, national accounts statistics are built on three very useful stocks of knowledge: the universal model, the operational model and the national compilation skills. The universal model is a stock of knowledge about the best way to define and classify the national economy for economic analysis. The operational model is a stock of knowledge of the specific national institutional and economic structure. The national compilation skills are a stock of knowledge about how to translate a very specific and incomplete national set of data into a plausible description of the national economy.

Ignoring the national accounts as tool for analysis and forecasting can result in serious conceptual and statistical pitfalls. However, national accounts as a tool for analysis and forecasting has also clear limitations. For a proper use, national accounts statistics should often be rearranged or be supplemented with alternative concepts and data.

As a *tool for communication and decision-making*, national accounts statistics are unique. They serve as the universal facts and language for thinking and communicating about national economies and their major components. They provide new opportunities for decision-making by providing information about major macro-economic developments, by providing explicit targets for many types of policy and by providing price-indexes for inflating contracts and agreements in real terms.

A major merit of national accounts statistics as a tool for communication and decision-making is its monopoly-position. From this point of view, imperfections in terms of concepts, comparability and reliability are irrelevant. However, this will frustrate efforts to overcome or better deal with these limitations, e.g. by developing standard concepts for major specific purposes, by improving comparability or by disclosing information about reliability. Furthermore, it will cause miscommunication, decision-making with unintended consequences and decision-making based on sub-optimal concepts.

The national accounts can also serve as a source of inspiration for *alternative accounts, budgetary rules and policy targets*. In this way, the official national accounts actually extends its scope as a tool for communication and decision-making.

As an input for *alternative estimates*, official national accounts statistics serve as a very cheap, well-designed, universal semi-manufactured product. These alternative estimates may reflect fundamentally different perspectives on the national economy, e.g. welfare-measures or generational accounts. However, some of the major alternative estimates are best labelled as non-official national accounts statistics, e.g. by providing much longer time series or by providing a handsome set of Domestic Product-figures in terms of purchasing power-parities.

For each of the four roles, (official) national accounts statistics have clear merits, but have also clear limitations. *Insufficient knowledge* of their concepts, reliability and specific national circumstances invites misuse and *can have unintended consequences*. This can take various forms, like:

- A wrong interpretation of national accounts statistics as a description, e.g. misunderstanding of what is economic growth or final consumption expenditure by the government;
- Using parts of national accounts statistics as objects of analysis, while they are not suited for such a purpose, e.g. the services of owner occupied dwellings, productivity assumptions for government services, banking services and health care or specific cells in the supply and use tables estimated as a residual.
- Wrong methods to estimate a model, e.g. by assuming that all observations are equally reliable;
- Wrong conclusions of applied economic analysis due to unreliable national accounts statistics, e.g. about the role of technological progress for economic growth;
- Wrong policy targets or policy targets with substantial unintended side effects;
- Policy targets or decisions affected by specific national concepts, compilation methods or institutional and economic circumstances;
- Wrong decisions due to unreliable data or inappropriate concepts, e.g. devaluation of the national currency in view of a seemingly high deficit on the current external account.

In contrast, sufficient knowledge of the national accounting statistics and their backgrounds can lead to various forms of proper use e.g.:

- Modification of the concepts;
- Combine national accounts statistics with other concepts and data, e.g. by using them as inputs for alternative estimates;
- A sensitivity analysis of reliability before actually using a specific national accounts statistic.
- Taking unreliability or specific features of national accounts data explicitly into account (biases, assumptions, blind spots);
- The development of international quality standards;
- Correct for conceptual biases by estimating their size/impact;
- Theoretical solutions to empirical problems, e.g. a model to remedy the absence of certain national accounts statistics.

**PART III.**

**THE FUTURE OF THE NATIONAL ACCOUNTS**

*The national accounts as a modern tool of information*



## 9. FOUR THREATS TO THE NATIONAL ACCOUNTS

*Relevance and reliability lost in a rapidly changing world?*

### 9.1 Introduction

Globalisation, regionalisation (the formation of regional blocks), electronic highways, automation, deregulation, privatisation and decentralisation. These are fashionable words. They show that on the brink of the twenty-first century the world is undergoing dramatic changes. The national accounts, being a product of this world, is changing too, e.g. data inputs, data processing techniques, data presentation and data needs are developing (at a moderate pace). In this part of the thesis, the future of the national accounts in such changing times will be investigated.

Four of the trends that are shaping the future of the national accounts are the subject of this chapter: globalisation, the formation of regional blocks like the European Union, automation and more market-oriented government. In sections 9.2-9.4, the future of the national accounts is sketched in view of these four general trends. Each trend will be discussed starting from the recent developments in national accounting.

This chapter does not only aim to provide a general vision on these trends. A major purpose of this chapter is also to demolish three persistent myths. They all three suggest a vanishing role for the national accounts:

1. "The globalisation myth": Globalisation makes national accounts superfluous, because in a global economy there is no need for statistics about national economies;
2. "The Orwellian myth": Advancements in automation, increases in the available micro-data sets and growing expertise in the automatic linking of data will bring an Orwellian world ("Big Brother is watching you"). This will reduce compiling national accounts statistics to a push on a button or making a selection out of a standard menu. The menu could allow choice with respect to e.g. scope, detail, concepts and timeliness.
3. "The micro-economic myth": National accounts statistics are a product of Keynesian economics and macro-econometric model-building. Now that micro-economic theory has started to dominate economics and small micro-economic models have superseded macro-econometric models, national accounts statistics will become obsolete and an anachronism for economic analysis and policy.

## 9.2 Globalisation and regionalisation (the formation of regional blocks)

### 9.2.1 Globalisation

#### *Globalisation as a trend*

Globalisation refers to the increasing interactions between countries and regions all over the world: goods, services, financial flows, information (faxes, phone-calls, television-news and communication via Internet), pollution and people (tourists, business men, politicians and refugees): they all move rapidly and in increasing quantities over the globe. This establishes a world market (e.g. for McDonalds hamburgers, Coca-Cola, Swiss watches, Dutch tulips, Windows-software and financial capital), a global production process (e.g. a car may have been produced partly in Asia, partly in the USA and partly in Europe) and universal norms and ideologies (e.g. capitalism, democracy, human rights).

Globalisation is not a recent development. For example, World War II can be regarded as the first real 'world' war as it involved Northern America, Europe, major parts of Asia and North Africa. However, during the last decade, globalisation seems to have accelerated its pace, e.g. the era of communism has ended suddenly and Internet is rapidly conquering the world.

### *Globalisation and the universal model*

The official, internationally standardised, national accounts figures are typical products of globalisation:

- all four generations of guidelines have been written and issued under the auspices of the United Nations and other international organisations (the World Bank, OECD, IMF and Eurostat);
- since the guidelines of 1953, guidelines are provided for compiling national accounts in countries all over the whole world, i.e. for all types of developed and developing countries but until recently excluding the (former-)communist countries;
- the United Nations publishes voluminous statistical yearbooks with national accounts figures from all countries;
- the United Nations, other international organisations and some countries have provided much technical assistance in setting up and improving the national accounts all over the world;
- the contributions to the United Nations are based on the official GNP figures.

A decade ago, a new set of universal guidelines on national accounting (the SNA93) was issued. The influence of globalisation on the SNA93 is evident in many respects:

- the sectors Non-financial and Financial Corporations are now sub-classified into those that are foreign controlled and those that are not. In this way, foreign influence via direct investment can be monitored in the national accounts.
- a new and separate chapter is devoted to an environmental satellite supplementing the standard national accounts. This reflects an increased attention for one of the most typical global problems, i.e. the environment.
- the end of communism had as a direct consequence that the SNA93 is now also applied in the former-communist countries; previously, they applied a fundamentally different system of national accounts (the Material Product System);
- countries, e.g. the USA, are more willing to comply to the international concepts and classifications than before. Differences between the national system of accounts and the international standards are considered to be less desirable and acceptable;
- the explicit requirement in revising the European guidelines on national accounting (ESA95) was consistency with the SNA93. So, despite having guidelines of their own, the EU-Member States fully accept the SNA93 as a world and European standard.

### *Globalisation and the demand for national accounts statistics*

Globalisation has influenced the demand for and supply of national accounts statistics in many ways. These changes determine the future of the national accounts.

Changes in the demand for national accounts statistics are:

- increased demand for describing relations and interactions with other countries and regions all over the world; these relations can pertain to imports and exports, direct investments, intra-company flows, establishment trade, financial flows, flows of information and knowledge and human flows;
- increased demand for statistics that are comparable all over the world; this suggests a further extension and standardisation of official, internationally standardised, national accounts figures.
- increased demand for statistics that describe the world economy as a whole and the roles played by the various regions; this implies that national accounts figures compiled by various national authorities should be additive and consistent;
- increased demand for statistics that describe phenomena with a strong global dimension, e.g. the environment, Research and Development, financial flows and intangible assets.
- increased demand for statistics that describe factors that induce globalisation, e.g. deregulation (abolishment of intra-EU customs borders or GATT agreements) and technological progress (computers, satellites, Internet).

These changes in the demand will lead to further changes in the supply of national accounts figures.

### *Globalisation and the supply of national accounts statistics*

Globalisation influences the national accounts figures also by changing the availability and quality of data sources used for compiling these figures. Some major examples are:

- increasing problems in obtaining accurate national information from internationally operating enterprises;
- decreasing completeness and reliability of administrative data sources due to an increase in the mobility of companies and persons;
- increasing importance of transfer-pricing;
- increasing importance of cross-border activities that are relatively difficult to measure, e.g. construction, engineering projects and processing to order.

These examples suggest that the quality of national accounts figures will deteriorate due to globalisation and that some changes in the present compilation methods are required. The latter could imply e.g. that extra attention is paid to multinationals to ensure consistency between their financial and non-financial figures and between their output in various countries (to avoid double-counting of output and value added).

The increasing complexity and the acceleration of changes in national economies can also necessitate a fundamental shift in compiling basic statistics. Simple calculations and straightforward standard processing routines do not suffice anymore. Mechanical compilation processes will lead more and more to meaningless statistics. In order to meet the complexity and dynamics of the modern economy, compiling basic statistics will therefore require more and more analytical skills, specific knowledge, e.g. of accounting rules and the object of the statistic and skills to adjust the compilation process in view of the specific circumstances of compilation. This will mean that compiling basic statistics will become more like compiling national accounts statistics and require more high-qualified personnel.

Globalisation and the fundamental changes in economic structure influence also the relevance of the national accounts statistics. National accounts statistics that focus on measuring flows of goods, tangible assets and production as defined in the SNA93, become more and more an incomplete overview of what is happening in national economies. Production can only be understood when also the revenues from holding gains (e.g. hedging and speculation), the wide ranges of intangible assets (e.g. copy-rights, broadcasting rights) and services (e.g. insurance services, various types of consultancy, pay-per-view television, information services provided by telephone, cable wire or Internet-connections) and the financing of production are seriously taken account of. Similarly, employment can only be understood when the various types of 'employment' like employment via temporary agencies, subcontracting, au-pair work, volunteer work, do-it-yourself activities and unpaid-household services are seriously taken account of (though imputing values for e.g. volunteer work is not suitable for the core system of accounts). For understanding consumption expenditure, measuring assets, liabilities and holding gains and losses of households (e.g. on their dwellings) become also more important. National accounts statistics should thus provide a complete and balanced overview that keeps track of all these fundamental changes in the national economies.

## **9.2.2 Regionalisation: the case of European unification**

### *European unification as an example*

The European unification is already drastically changing the national accounts of the EU-Member States (see section 4.3). These changes suggest also changes that are to come at the world level, as other countries and regions will face data demands similar to those in Europe and will want to have data comparable to those of the EU-Member States. When new Member States enter the European Union (e.g. Poland and Turkey; they are now labelled PACs: Pre-Accession Countries) and other



OECD-countries like the United States, Japan and Australia will follow (part of) the work done in the EU, this will be a further stimulus for non-OECD countries to follow also the European example. Furthermore, the European unification can be regarded as a forerunner of regionalisation elsewhere in the world, e.g. in North-America (NAFTA), Africa and Asia. Finally, the European unification also has many similarities with globalisation, e.g. increasing influence of non-national economies. So, the European experience can give clues to what globalisation and regionalisation elsewhere in the world will mean for the national accounts. Will globalisation and regionalisation reduce the role of the 'national' accounts statistics?

*The demand for national accounts statistics*

The European unification has not made national accounts statistics superfluous (see section 4.3). Quite the contrary, it has increased the demand for a balanced set of national accounts statistics that is comparable and available for all EU-Member States; this set includes not only 'national' accounts statistics but also regional accounts statistics. Some national accounts figures have been selected to play a special role in the European unification: GNP figures will probably be the Commission's major own resource in the future and national accounts figures on government deficit and debt will play central roles in co-ordinating and monitoring the European monetary policy.

Furthermore, the Member States and the Commission have been aware that the present national accounts do not suffice for such usage. They have therefore launched an ambitious programme for improving the quality and comparability of present national accounts figures and for drastically extending the set of national accounts statistics that are available for all EU-Member States.

Also the need for a legal framework for the national accounts figures and concepts was acknowledged. A legal framework clarifies the responsibilities of all parties involved and indicates an objective way of resolving conflicts. Considering the great political and financial importance attached to the national accounts figures, such a legal framework is warranted.

The major contribution of the GNP Committee has been that it has shown how to bridge the gap between the international guidelines and national compilation practice. To achieve this, jurisprudence, auditing, special support programmes for statistically less advanced countries and further development of national accounts compilation techniques are required. Also clear minimum quality standards on data sources and estimation methods should be set for each type of national accounts statistics. These should be further developed at the European and global level.

The creation of the EMU has increased the demand for statistical information on financial flows within the European Union and national Balance of Payments data. However, in the long run, after the EMU has been established for some time, statistical information on intra-EMU money flows and national Balance of Payments data will become superfluous for European monetary policy. For the national accounts, this will mean a decreased interest in national financial accounts and national Rest of the World accounts and an increased interest in European financial accounts and European Rest of the World accounts.

The use of national accounts figures for important political or financial purposes can endanger the integrity and balance of the national accounts statistics. It may induce political pressure on the outcome of national accounts statistics, it can lead to an excessive focus on the national accounts variables used for these political or financial purposes and can paralyse the further development of the national accounts statistics. This issue was explicitly addressed by a paper from the Austrian Statistical Office (Franz, 1996).

In Europe, these dangers have been contained by the establishment of a legal framework, auditing procedures, improvements of the inputs for the national accounts, linkage of the ESA95 to the SNA93 and a statistical programme that aims to provide a balanced set of national accounts statistics in about 2005. In the short run, these measures have drastically improved the comparability of European national accounts statistics. Nevertheless, in the longer run, care should

be taken that some of the Austrian worries come true. The Austrian Statistical Office (Franz, 1996, p. 4) proposes therefore:

- to put the issue on the permanent agenda of the competent international forums;
- to establish regular links to the scientific level "to get feed back on the suitability of the various concepts with a view of theoretical needs";
- "to identify and maintain elements of flexibility felt necessary in the wider context. In particular, the anticipated effects of ad hoc solutions by means of legalistic measures, and the consequences of alternative solutions may be kept under study".

### 9.3 Automation

Automation is changing the world and also the national accounts statistics. The national accounts statistics are affected in many ways. Automation changes the statistics used as inputs for the national accounts. Transmitting and processing of administrative and survey data will become faster and in general less prone to human error. However, when errors do occur the consequences can be much more dramatic as they are more unexpected, less likely to be detected and may more easily be drawn to ridiculous conclusions (as the statisticians can think too easily that 'the machine' has taken over responsibility).

Automation has also changed the dissemination of national accounts figures, e.g. in the form of a publicly available electronic data bases. In this section we will focus on two other changes due to automation:

- changes in the compilation of national accounts figures;
- changes in the presentation of national accounts figures.

#### *Changes in the compilation process<sup>108</sup>*

Only some decades ago, compiling national accounts figures was paper and pencil work. Then, computers and adding machines started to help processing and storing the data. Since then, the computers' calculation speed and the software have drastically advanced. Common tools for national accountants are now networks of personal computers running spreadsheet- and database programmes for most of the normal processing work, a central computer for the most demanding calculations and pocket calculators for simple and short-cut checks of data.

The continuous developments in hardware and software involve a lot of *extra work* for national accountants. They have to get accustomed to the new hardware and software, modify their working habits and compilation methods, convert and re-process old files and anticipate new changes.

The continuous developments in hardware and software imply also a lot of *new possibilities* with respect to the processing of data, the linking of data, the validation of data and balancing data. For various reasons, however, full automation of the compilation of the national accounts figures seems unlikely, even in the distant future.

National accounts figures are compiled on the basis of very heterogeneous sets of information which are incomplete, inconsistent and often changing from one year to another. These changes may pertain to:

- the accuracy of the figures, e.g. the accuracy of the Foreign Trade Statistics of most EU-Member States drastically decreased due to the introduction of the Intrastat-system for recording intra-EU trade;
- the timeliness of the figures, e.g. a statistic may unexpectedly arrive too late for incorporation in the national accounts estimates;

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<sup>108</sup> An overview of compiling national accounts statistics is provided by chapter 7.

- the completeness of the figures, e.g. the decentralisation of government actually is rapidly decreasing the coverage of the central government information, while in the short run no comparable information may be available on the decentralised government units;
- the concepts underlying the figures, e.g. changes in tax regulations change tax data and changes in the social security system may change the concepts of wages, social security contributions and social benefits used in many data sources, like industry-statistics, wage-data and social-security statistics;
- the classifications used in presenting the figures, e.g. the classification by product and by industry of the European industry-statistics has changed recently.

The economy is changing too, e.g. new products are introduced, enterprises merge, others go bankrupt, the social security system is reorganised, the government is privatising, decentralising, abolishing some types of taxes and introducing new ones, leasing cars and machinery gets popular, people are more contracted out and working more via temporary agencies, and the banks are drastically automating a major part of their services. Such changes in the economy are another reason that the data to be used for compiling the national accounts change frequently in coverage, definitions and accuracy. The changes in the economy make it also difficult to anticipate incompleteness and inconsistencies in the various inputs for the national accounts.

The national accounts are a whole range of statistics that are consistent in their concepts, classifications and figures. This consistency is a great merit for users of these statistics. However, this consistency implies also that a numerical change in one part of the system has repercussions for many other parts. For example, a change in output figures for the construction industry can influence the estimates on its value added, its operating surplus, its taxes on output, its value added per employee, capital formation of construction works by other industries, Domestic Product and saving and net lending of the national economy. Furthermore, all these figures should show plausible changes over time. This implies that problems in a specific part of a national accounts statistic (e.g. unexpected inconsistencies) can spread like a disease over the whole range of national accounts statistics.

This 'disease' of inconsistency can only be cured by taking account of the whole system of national accounts, all its interlinked statistics and all available knowledge on the national economy and its recent changes; the latter includes also various types of qualitative knowledge (e.g. from newspaper-articles on a strike or disaster in one specific branch or incidental reports and studies on a big company or a specific issue, e.g. underreporting to tax authorities). Compiling the national accounts can best be regarded as solving a fuzzy problem: straight-forward optimal solutions do not exist, but some solutions are clearly better than others.

The scope of the outputs of work on the national accounts is often also frequently changing, e.g. in timing, detail, classification, concepts and scope. These changes imply also that the inputs that can be used change (e.g. more timely publication of data can make it impossible to use data sources arriving late) and that the inputs should be used differently (e.g. changes in the modifications to correct for differences in definition and limitations in coverage).

Compiling the national accounts is an interactive and partly ad hoc procedure where also knowledge of a country's specific institutional arrangements and business practices is required. In general this implies that the compilation process should be flexible. Also the software for compiling the national accounts should be flexible and open for change very quickly and easily. Only in this way, a whole range of consistent national accounts statistics can be published on the basis of imperfect and incomplete inputs while these inputs, the economy and the data to be published change frequently and often unexpectedly.

Automation has already drastically changed national accounts procedures and will change it further. Some barriers to further automation will be removed. Data sources that serve as inputs for the national accounts will become more and more standardised. Know-how on national accounts compilation techniques (e.g. balancing detailed supply and use tables) and strategies (e.g. strategy

of continuity: at what level of aggregation will it be applied?) will be further developed and spread internationally. For typical compilation problems (e.g. how to change from one product-classification to another? how to calculate time-series on the basis of this new product-classification?) standard solutions will be worked out. International software can be developed for processing and checking some standard inputs, for balancing the accounts, for a proper rounding off of the national accounts data and for calculating revised time-series. All these software should leave room for interactive and ad hoc adjustments and be flexible enough to cope with changes in the inputs, the economy (e.g. some new types of taxes) or the desired outputs.

#### *Presentation of the national accounts*

Automation is also drastically improving the *presentation* of the national accounts figures: details and links can be better, clearer and easier shown in an interactive data base system. Nevertheless, it should be realised that national accounts statistics often do not show more details for reasons of confidentiality or because the data at a more detailed level are not reliable or even absent. Automation can not solve these reasons for limited detail in the national accounts statistics.

National statistical offices like Statistics Netherlands are already starting to present their national accounts figures as part of publicly accessible data bases that include all available economic and social statistics. This presentation will make inconsistencies between statistics and their differences in concepts and classifications more visible and thus also more unacceptable to users of these statistics. This presentation will therefore stimulate the development of consistent sets of official economic and social statistics; in such a set, the extended national accounts statistics should play the role of the central overview-statistic and global framework for economic statistics.

### **9.4 More market-oriented government**

The economic crisis of the thirties, the Second World War and the period of reconstruction immediately after the war, all stimulated a more active and larger role of the government. Keynesianism became the dominant economic ideology and theory. During these decades, official national accounting started to flourish (see section 2.3). International guidelines were developed and national accounts figures were increasingly used for monitoring and managing the government and the national economies.

Since the eighties, the tide has turned: Keynesianism is out, communism has become an anachronism and the market-ideology has won: the government should privatise, decentralise and deregulate a major part of its tasks, should cut down on subsidies, taxes and social transfers and should reduce its deficits and debts.

What are the consequences for the national accounts of this turning of the tides? We will distinguish two types of consequences:

- changes in the demand for national accounts statistics;
- changes in the inputs for the national accounts statistics.

#### *The demand for national accounts statistics*

The demand for national accounts statistics will change due to the turning of the ideological tides. It is not expected that this will be a dramatic change. National accounts statistics will maintain their role as internationally standardised overview-statistic as there is no other statistic which can play this role. This role is indispensable for the government and all other parties interested in statistical information on national economies, e.g. for financial investors, the political parties not in the government and the international organisations. In fact, globalisation will increase the need for solid and comparable national accounts statistics (see section 9.3).

Nevertheless, two types of changes will occur. The first change is that the *national government becomes less important as customer* of national accounts statistics, while other customers, like national and international companies and international organisations, become more important. These other customers also have often somewhat different preferences for statistics than the national government has. For example, detailed supply and use tables are important for companies because they can reveal market shares and market opportunities.

A second change is that the *statistical preferences of the national government* are likely to *change*. The national accounts statistics are less important as a tool for macro-economic stabilisation policies. They should therefore address the new policy issues, like:

- the link between the economy and the environment;
- privatisation, deregulation and decentralisation;
- the role of ICT and communication;
- the knowledge economy;
- the costs and benefits of public infrastructure.
- the costs, financing and accessibility of health care in view of an ageing population;
- the costs, financing and accessibility of social and private insurance;
- the economics of private and public security.

#### *The inputs for the national accounts statistics*

The turning of the ideological tides has also affected the inputs for the national accounts: they will decrease due to deregulation, decentralisation and privatisation.

As part of deregulation by the government, the respondent burden of statistical surveys and administrative procedures should be limited. This will often be attained by reducing the number, frequency and detail of surveys and administrative procedures. This will often imply a reduction in the information available for compiling the national accounts statistics. The respondent burden can also be limited by automated reporting systems connected to the respondent's administration, by combining various surveys or by combining statistical surveys and administrative procedures. In Europe, an important example of deregulation was the replacement of the administrative formalities at the intra-EU customs borders by the introduction of the Intrastat-system for both tax and statistical purposes (see section 9.2.2).

As part of decentralisation of the government, central administrative regulations and practices are likely to be abolished or become less strict. As a consequence, administrative information at the central government on the local government units will -at least temporarily- decrease, e.g. some type of information will no longer be available, other information will arrive later or will be of lesser quality due to less strict supervision. Furthermore, the way the administrations are kept become more heterogeneous and the willingness of local government to provide information to a (central) statistical office can decline. The implication for the national accounts is that its information on the local government will decrease in quantity and quality. This is even more regrettable as local government is becoming more important by taking over tasks from central government.

Privatisation of public corporations and government units can also reduce the willingness to disclose information to statistical offices and to meet statistical demands. The work involved in meeting the statistical demands is an easy victim for reducing the costs of the privatised units. Privatisation will therefore often decrease the national accountants' information on the privatised corporations and units.

## 9.5 Summary

This chapter investigated the future of the national accounts in view of four general trends: globalisation, European unification as an example of regionalisation, automation and more market oriented-government.

The four trends will influence the supply and use of national accounts statistics in various ways. Globalisation and regionalisation will increase the political use of national accounts statistics. This reinforces requirements on international comparability and standardisation as evidenced by the European experience.

Globalisation and more-market oriented government will pose serious difficulties for the quality and completeness of the statistics and administrative data sources used for compiling national accounts figures. A pro-active response is essential for statisticians. The possibilities for national accountants may be increased due to automation, putting minimum standards on the inputs for the national accounts statistics to increase their international comparability and advances in national accounts compilation techniques.

More-market oriented government can stimulate the development of more efficient, effective and attractive national accounts statistics that appeal to a wide range of data users. However, it can also result in cutting down the resources for national accounts statistics and its major inputs below a minimum-level. National accounts statistics will then be trapped: resources are not enough to meet a minimum standard of reliability, to make national accounts statistics more attractive and to find new users; the potentials of the national accounts statistics are then trapped.

There are three persistent myths about a vanishing role of the national accounts. They are all wrong (see section 9.1).

The globalisation myth suggests that national accounts statistics will become irrelevant in a global world. However, also in a global world there will be a clear and continued need for statistics about national economies, like the national accounts. Globalisation will probably stimulate the demand for much more standardized and extended national accounts statistics and for national accounts statistics describing interactions between national economies. Globalisation may even stimulate the development of regional national accounts statistics.

The Orwellian myth suggests that in a very well automated world compiling national accounts statistics will be reduced to a push on a button or making a selection out of a standard menu. However, compiling national accounts statistics will remain an interactive, fuzzy, process requiring a substantial amount of tacit knowledge. The driving forces behind this are a constantly changing set of data (changes with respect to e.g. timeliness, scope, detail and concepts), a constantly changing economy and institutional structure, the continued occurrence of major specific new events and changes in the statistical and political environment (e.g. reorganizations of the statistical infrastructure, reduction of the available resources and changes in the political priorities). The increasing complexity and acceleration of changes in national economies will make compiling basic statistics more like compiling national accounts statistics and will require much more high-qualified personnel and tacit knowledge.

The micro-economic myth suggests that national accounts statistics will become superfluous in a world dominated by micro-economic theory and micro-econometric model-building. However, national accounts statistics have a unique focus. Their overview is indispensable for monitoring macro-economic developments and for indicating the macro-economic importance of micro-economic research. As a description and tool for communication and decision-making, the unique focus and specific features (e.g. based on a universal set of concepts that are not affected by changes in administrative realities) ensure also that they can not be replaced by micro-oriented statistics and concepts.

## 10. THE NATIONAL ACCOUNTS AS A STATISTIC IN THE 21<sup>ST</sup> CENTURY

*Serving clear data needs in an accessible and efficient way*

### 10.1 Introduction

In chapter 9, the challenges and dangers for national accounts statistics in the 21<sup>st</sup> century have been investigated. In this chapter, it is discussed how these challenges and dangers can best be met. Three issues are distinguished:

1. improving efficiency;
2. improving the product;
3. improving marketing and education.

These are discussed in sections 10.2, 10.3 and 10.4. A summary is provided by section 10.5.

### 10.2 Improving efficiency

The turning of the ideological tides influences also the production and management of official national accounts statistics and statistical offices. All over the world, official statistics are being challenged to become more efficient and more effective in meeting data demands and raising resources. Official national accounts statistics becomes thus more a product which should be produced efficiently, be improved continuously in view of changing data demands and be marketed actively.

Efficient production of official national accounts statistics requires:

- regular investments in improving the compilation techniques and the skills and knowledge of the compilers;
- efficient relationships with data sources used as inputs for the national accounts statistics;
- an optimal balance between the efforts of processing and the relative importance of the outputs.

We will shortly explain what these requirements can imply for improving the efficiency of compiling national accounts statistics.

#### *An international strategy*

Investments in the compilation techniques and the compilers refer to further automation, critical evaluation of present compilation techniques, consideration of using alternative compilation techniques, more international sharing of knowledge on best practices, special courses for training statisticians and targeted research on specific compilation issues.

Automation, evaluation, courses and research should preferably be taken up internationally: development of international standard software for compiling national accounts statistics, audits on the efficiency of the compilation techniques by international consultants, international courses on simple as well as advanced national accounts compilation techniques and an international research programme on national accounts compilation issues. Such an international approach can exploit best all available know-how, can profit from the economies of scale involved and avoids doing double work (see also Franz, 1996).

At present, the international approach on improving compilation techniques is piece-meal and ad hoc. It is limited to some beginners' courses on compiling the national accounts (e.g. the Dutch course on compiling the national accounts in practice) and the writing of handbooks commissioned by the international organisations. Hardly any articles and books have been published about national accounts compilation techniques. As a consequence, compilation processes underlying official national accounts statistics are to a great extent based on compilation techniques developed nationally and in isolation. They are not based on a fruitful exchange between national accountants of best practices and they could not benefit from specialised research in national accounts

compilation techniques. Furthermore, the compilation processes underlying non-official national accounts statistics, e.g. time series compiled by academic researchers on economic history, are often based on limited knowledge of the official compilation processes.

The current international approach depends also too much on the willingness of some statistical offices to free temporarily one or more of their experts from their normal duties. This willingness is even a clear risk for the statistical office involved: their best experts are also the backbone of the national compilation process, they are often working at the executive level and they are very difficult to replace, in particular in the short run.

The present international approach is piece-meal and should therefore be replaced by a long term strategy for improving general knowledge about national accounts compilation techniques. A major focus should be generating practical information, e.g.

- articles about national experience with developing new software and using standard software for compiling national accounts statistics. This can include reports about ambitious automation projects that failed<sup>109</sup>, but may also cover simple routines that worked well in practice<sup>110</sup>.
- articles about balancing the accounts, the assumptions and plausibility checks used and their consequences for balancing;
- articles about practical solutions in compiling and updating time series.
- articles about compilation strategies, e.g. about continuity and prudence.
- overviews of common errors in interpreting and applying the guidelines. For example, taxes on products are in compilation practice sometimes also allocated to non-market output. However, they can by convention not be levied on non-market output. Similarly, abolishing the exemption of VAT for specific products/producers may actually be regarded as no change in the VAT-rate. However, it implies an increase in the average VAT-rate. A wrong interpretation will imply wrong measures of price- en volume change. An other case in point are the rents of dwellings and individual rent allowances. Changes in the average individual rent allowances seem to be irrelevant for recording household final consumption expenditure. However, increases in the average individual rent allowance should be regarded as an increase in the price of social assistance benefits in kind and government final consumption expenditure and as a decrease in the price of household final consumption expenditure.

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<sup>109</sup> In the Netherlands, the automation of a balancing system for input-output tables (APS) failed in the eighties. The ambitions were too high, e.g. the system should show all kinds of margins of error of the various data and estimates at a very disaggregate level. This automation canard was the major reason for years of delay in revising the Dutch national accounts. In the end, a very simple system was developed which only contained the most essential information. This worked rather well and was later modernized and extended. This automated balancing system for input-output tables should now be regarded as one of the major compilation jewels of the Dutch national accounts.

<sup>110</sup> Old routines, like compilation sheets developed in the paper and pencil-era, may well stand the test of the time. An example from Dutch compilation practice may illustrate this. Compilation sheets for the estimation of government accounts were developed in the sixties or seventies. These sheets showed in a matrix format for each transaction the specific layer of government (State, municipalities, provinces, social security funds, private subsidised schools, etc.) involved and a further specification, e.g.:

- a breakdown of capital formation by type of asset;
- a breakdown of final consumption expenditure into the various costs of production (e.g. compensation of employees, consumption of fixed capital and intermediate consumption), sales and own-account capital formation
- a complete overview of other income transfers or interest by paying and receiving sector/specific layer of the government. These sheets have of course been modified several times, e.g. in order to take into account of the substantial changes in the universal concepts with respect to the government

These sheets are also now embedded in a modern automation system. Nevertheless, they are still the backbone of the Dutch estimates on the revenue and expenditure of the general government, as they provide a simple overview and a very strong check on consistency. These sheets should therefore still be regarded as jewels of Dutch compilation practice.



This international approach can also be partly run on a commercial basis, i.e. by companies or national statistical offices selling their software, audits and courses to statistical offices and other compilers of national accounts statistics.

#### *Relationships with data sources*

The building-bricks for constructing national accounts statistics are various other statistics and administrative data sources. The second requirement for efficient compilation is therefore an efficient relationship with these data sources. This relationship is not a one-way relationship, as the national accounts and its input-statistics share a lot of common interests. For the national accounts, an input-statistic is often not only an input but reflects also a user-group for the national accounts statistics. For the input-statistic and its data-users, the national accounts is not only a data-user but also a frame of reference to put the statistic in a national perspective, e.g. to express value added in construction as a percentage of GDP. In fact, both the input-statistic and the national accounts statistics may have common users.

To profit optimally from the joint interests, good communication and co-ordination are required on concepts, classifications, timing, formats of transferring data, etc. National accountants should clarify why and how they transform the data from the input-statistic into national accounts data. The processing of the data should also be co-ordinated, because some checks can best be done in compiling the input-statistic and some others in compiling the national accounts. Furthermore, national accountants may perform some plausibility-checks that have already been done or they may assume that some checks have been made that in fact have not. For most common input-statistics (e.g. Labour Force Survey, Family Expenditure Survey, Industry statistics), *international quality standards* that are regularly monitored seem to be an efficient solution.

Joint statistical products could also be developed, e.g. in the form of a satellite or satellite account. Examples of these are a satellite linking national accounts statistics and environmental statistics, a health care satellite, a Research and Development satellite or a social policy satellite (see also section 6.6). The joint products can also be a simple table showing the links and differences between the national accounts statistics and the input-statistic.

#### *Balance between compilation process and outputs*

The third requirement for efficient compilation is a good balance between the efforts of processing and the outputs, i.e. the national accounts statistics and their uses. For estimating important parts of the national economy, sizeable compilation efforts are justified. However, not much compilation efforts should be put in estimating accurately a very limited part of the national economy which does not serve any special (important) data needs.

This notion can be made explicit by developing explicit quantitative standards, e.g. the half pro-mille norm the present author proposes for designing the compilation process. This norm indicates that no separate estimates should be made for parts of the economy that are smaller than half a pro-mille of Domestic Product. This norm reflects that many key-figures are in terms of pro-milles, e.g. net lending by the government as a percentage of Domestic Product is 2,6% or the relative size of manufacturing as a percentage of Domestic Product is 30,5%. The norm can also be interpreted for parts of the economy. Suppose the national economy is split into ten industries. The average size of an industry is therefore 10%. The half pro-mille norm indicates therefore that for an industry of average size no separate estimates should be made for parts that are smaller than a half percent of the total industry. For a relatively small industry of only 1 % of Domestic Product no separate estimates should be made for parts smaller than 5 percent of the total industry.

Quantitative rules of thumb to ensure balance of efforts can be applied to various stages of the compilation process. A major case in point is the business register for statistical purposes. Splitting of administrative units into several statistical units is often essential for compiling meaningful statistics, e.g. a more homogeneous classification of units by industry. However, such splitting also

drastically increases the costs for properly maintaining and updating the business register. Furthermore, it can also hamper the linking of administrative and statistical data, e.g. of administrative wage records and statistical surveys on wages by industry. Splitting only serves the national accounts purposes when the advantage of more analytically useful information outweighs the negative trade-offs on obtaining complete, reliable and up-to-date information. Splitting should therefore only be allowed for units with substantial economic importance.

There is always a tendency to focus the compilation efforts on parts of the economy for which already good data sources exist and to estimate and publish for these parts statistics at a very detailed and disaggregate level. At the same time, often few efforts are spent on quantitatively or politically important parts of the economy on which solid information is relatively scarce. This practice is not efficient in view of the outputs.

Similarly, there is often a tendency to balance the efforts in view of old data needs and to forget to serve and explore new data needs. For example, disproportionate attention is often paid to compiling statistics on manufacturing compared to statistics on services. In fact, efficient compilation should be biased towards measuring changes in the economic and institutional structures: even if these changes do not represent relatively large amounts of money, they are often the messengers of bigger changes that are still to come and a proper and early signalling of changes should be a major task of national accounts statistics.

Even with extra efforts, the accuracy of national accounts statistics on parts of the economy on which quantitative information is relatively scarce and on recent changes will be relatively low compared to the accuracy for other parts. Nevertheless, the value added to users will be relatively high: it provides the best estimate that can be made and has a high news value.

Typical national accounts compilation problems have a huge correlation with important policy issues. This applies e.g. to estimates for small enterprises (how well are they doing compared to the bigger ones?, are they the source for economic growth and innovation?) and underreporting of incomes, employment and sales (all the black economy issues). These problems should not be a source of shame for national accountants, but should be regarded as a challenge with high news value. Separate publications of best estimates on these issues should even be considered. Co-operation with other parties interested in this output (e.g. a Ministry, a research institute, the tax authorities, etc.) can help financing proper estimates, can help exploiting data and know-how and can result in better and more tailor-made national accounts statistics.

Non-official efforts to compile national accounts statistics can also indicate a lack of balance between the efforts of processing and the official output. For such alternative outputs, e.g. long consistent time-series, regional accounts or balance sheets, the benefits for this specific data user exceed the substantial compilation costs involved. These non-official compilation costs are relatively high, as substantial investments in national accounting knowledge and skills are required for only one project. Furthermore, these alternative outputs are likely to have positive external effects for other data users: they may not be interested when they have to make substantial investments, but they can be interested when provided free or at low costs. The various types of official national accounts statistics are likely to have met much less demanding tests. The optimal supply of national accounts statistics can therefore be improved when serious efforts to compile non-official national accounts statistics are used to reconsider the official output-mix.

Providing information on the data sources and compilation process will also be a strong stimulus for further improving the efficiency and the international comparability. Efficiency is in particular served by demolishing the various myths and taboos surrounding the efficiency of the national compilation processes, e.g. "increasing the timeliness of national accounts statistics necessarily implies a loss of reliability". However, the wonder of more timely and more reliable data can often become reality by getting rid of old inefficiencies, by being obliged to seriously investigate the existence and use of alternative data sources or by profiting from new circumstances (e.g. better automation, access to other data sources).

### 10.3 Improving the product

The national accounts can be improved by a better link to specific data needs (satellites) and by giving guidance to the use and proper use.

#### *Satellites*

More attention should be paid *to specific purposes* by drawing up satellites and by adjusting the national accounts statistics in view of the national economic circumstances. This is explicitly recommended by the international guidelines.

By drawing up satellites, links can be established with non-monetary data (e.g. on the environment, education, health care and the population), with micro-data (e.g. household panel-data, household budget survey data and labour force survey data) and with administrative data (e.g. business accounts, government accounts and VAT-registers).

For establishing these links and for serving specific data needs, the use of alternative concepts can be required, e.g. tax concepts, concepts used in national economic policy or concepts for applied economic analysis. In chapter 6 also many examples have been given how the link with specific purposes can be improved.

Satellites should preferably not be developed in isolation by national accountants. Interaction with data users is essential in order to ensure that the focus of the satellite is right, that the presentation is sufficiently accessible and comprehensible and that the potential new data users become aware of the new product.

#### *Guidance about the use and proper use*

More attention should be paid to *giving guidance to data users about the proper use and misuse of national accounts statistics*. This can be achieved by:

- general research on concepts and compilation methods;
- investigating user practice;
- modifying the guidelines;
- supplementing national accounts statistics with other information;
- changes in the presentation of national accounts statistics.

#### *General research on concepts and compilation methods*

A systematic investigation of *the links between economic theory and national accounting concepts* is important to further develop and understand the national accounting concepts and to clarify the link with economic theory to those familiar with economic theory or working in this field. Examples of this type of research are Vanoli (2002), Bos (1993, 1995, 1996a and 1997) and chapter 6.

A lot of systematic research is required for investigating the *consequences of alternative concepts and alternative estimates for various types of use* (see also Richter, 1994 and Bos, 1994a). An example of specific user-oriented research is Bos (1992b), which focuses on the choice between net and gross figures of income and value added. Another case in point is Whelan (2002) which addresses pitfalls in using chain indices.

#### *Investigating user practice*

The major uses of national accounts statistics in a country or a group of countries should be investigated critically. Such an investigation can identify major cases of misuse, sub-optimal use and proper use. Specific cases of misuse or sub-optimal use can be remedied by taking proper

action, e.g. change the national accounts statistics or change the specific way the national accounts statistics are used.

However, the investigation generates also much more general knowledge, i.e. about:

- major imperfections of national accounts statistics for specific purposes;
- common misinterpretations and misuses of national accounts statistics;
- smart and practical ways to use national accounts statistics for specific purposes;
- how to best overcome specific types of limitations of national accounts statistics;
- the usefulness of standard national accounting concepts for non-national accounting purposes, e.g. for increasing the comparability of the accounts of various government units.

This knowledge can then be described, discussed, tested and applied internationally.

### *The role of the guidelines*

The SNA93 and ESA95 contain already some guidance in the introductory and other chapters, e.g. explicit warnings that GDP and National income are not welfare measures. The ESA95 chapter on the input-output framework (drafted by the present author) is an effort to provide simultaneously guidance to data compilers and data users. Attention is paid to the statistical and analytical purposes of input-output tables, to alternative calculations on the basis of these tables, to specific types of analysis served by these tables, to data problems in compiling these tables, to national accounts conventions crucial for a good understanding of these tables and to modifications to serve better some specific purposes. This approach should be elaborated and extended to the sector accounts and other parts of the national accounts.

When for some specific purposes or circumstances the core-concepts induce serious misuse, internationally agreed upon modifications can be introduced that pertain only to such purposes or circumstances. This can apply e.g. to correcting national income as a tax measure for the damage due to natural disasters or to correcting government net lending for holding losses (and gains) on loans. Such *standardized supplementary concepts* should be included in the international guidelines and could be included in standard satellites (see also chapter 6).

### *Accompanying national accounts statistics with supplementary information*

National accounts figures reflect the operational concepts, data sources, statistical techniques and compilation strategies used. Providing information on these (e.g. publish statistics and sensitivity analyses about national accounts statistics) is therefore indispensable for a proper use of national accounts figures (see chapters 7 and 8).

International data bases of specific sets of national accounts statistics from various countries seem to be a major help for data users. However, if they do not provide information on the meaning, comparability and limitations of these statistics, they serve in fact as a major stimulus for misuse and misinterpretation ('statistical crimes'). A case in point is the International Sectoral Data Base by the OECD.

According to Kets and Lejour (2003), the time series about the period 1970-1990 confirmed "the stylised fact that Total Factor Productivity growth is relatively high in agriculture and relatively low in services". These results were used to calibrate a general equilibrium model about sectoral developments in European countries and the world. However, for such use the OECD data base has clear limitations, e.g.

- for agriculture, the role of land, i.e. one of the major capital inputs, is ignored, as the data base records only capital formation;
- for major parts of services, e.g. the government services, health care and financial services, the operational concepts used for the prices and volumes of output are likely to be incomparable and not very reliable.

Individual researchers do not have a real alternative: they may be aware of some of the fundamental measurement problems, but they lack the relevant supplementary information, do not

have time and resources to start investigations themselves, want to draw conclusions about a large group of countries and simply imitate established user practice. Such researchers therefore do not complain about reliability and comparability of the data in this data base and about the lack of supplementary information in the data base. Sometimes they even express their gratitude for having such a nice, user-friendly and very encompassing data base. However, such absence of critical consumers is misleading and should not be an excuse for accepting the current major imperfections in comparability and reliability.

For a proper interpretation of national accounts statistics, also *the role played by specific events and institutional circumstances* should be taken into account. The national accounts should therefore be supplemented with such information, preferably including a quantitative assessment of their impact.

For some specific purposes and circumstances *more encompassing sets of official national accounts statistics are definitely required*. This applies e.g. to the convention to ignore the decrease in the value of subsoil-assets in measuring production and income. This limitation of the production and income concepts in the international guidelines is best overcome by also taking into account the balance sheet and net worth: depleting subsoil-assets will turn up as a reduction in the net worth of e.g. an oil producing country. The same applies e.g. to holding gains (an other changes in the value of assets accounts should be drawn up) or to environmental damage (a satellite on the link between the environment and the national accounts can best deal with this data need).

A major merit of the present national accounts conventions is that they require only a limited amount of modelling, e.g. in estimating capital consumption via the Perpetual Inventory Method or in estimating the value of the services of owner-occupied dwellings. However, *for a balanced comparison of national economies sticking to 'statistics' does not always suffice*.

For example, comparing social benefits from one country to another is seriously distorted as in some countries social benefits are net of taxes and social premiums while in others still taxes and social premiums are to be paid. Correcting for this difference between net and gross social benefits amounts to 'modelling', as only sophisticated calculations can do justice to the common fact that the taxes and social premiums depend also on many individual circumstances (e.g. being married, age or sex). Similarly, modelling is also required for calculating more welfare oriented or forward-looking concepts or for forecasting. So, for various data needs, national accounts statistics need to be supplemented with model-estimates.

As a consequence, *national accounts statistics and model-estimates should be developed and presented more as joint and complementary products*. Only by joining efforts, national accountants can avoid some types of serious misuse and meet important data demands.

Nevertheless, a clear division of tasks with model-builders is wise in order to stress the differences between national accounts statistics and model-building, to keep an independent position and in order to profit from efficiency gains of specialisation. Modelling results should also be presented differently in the national accounts, namely as part of supplementary tables or concepts.

#### *Efficient and accessible presentation of national accounts statistics*

Providing guidance to users also implies that the *presentation of national accounts statistics should be straightforward and simple* (e.g. distinguishing only two main sets of statistics: the sector accounts and the input-output framework) and not leaving too many, only slightly different, options open.

For example, there is a tradition of emphasising the subtle differences between Net Domestic Product at factor cost, Net Domestic Product at market prices, Gross Domestic Product at factor cost, Gross Domestic Product at market prices, Gross National Income at market prices and Net National Income at market prices. However, for most users, these differences are irrelevant: they only want to use what they always used or what is the best according to official or international

standards. Furthermore, in most cases, the numerical differences in terms of growth are marginal and within the bounds of statistical insignificance. By stressing these 'bookkeeping' differences, attention has been drawn away from the real content of national accounts statistics and national accounts has come to be regarded as an unattractive and inaccessible subject.

Providing guidance to users can also imply the *reduction of the publication of fake statistical information*. Examples of the latter are:

- very detailed input-output tables mainly based on outdated and fixed ratios;
- statistics published in million euros but whose margins of reliability are better indicated in terms of hundreds of million euros.

Providing guidance to users may even imply an explicit link to standard software on economic modelling, e.g. for conducting simple input-output analyses or for drawing up generational accounts.

#### *Other improvements*

Sections 4.3 and 9.2.2 described how European unification has been improving the official national accounts as a product. Similar changes at a global level will also be an improvement of the national accounts.

The *international comparability* of national accounts statistics can be improved, e.g. by international audits and by developing international standards on the quality and coverage of the inputs for the national accounts. This requires a substantial initial investment. However, in the longer run it need not mean that compiling national accounts statistics will be much more expensive. Furthermore, a better international comparability will substantially improve the national accounts as a description and tool for economic analysis and policy.

The *product range* of the national accounts statistics published by the various countries should *be extended*, e.g. with quarterly accounts, supply and use tables, balance sheets, good linkage to employment statistics, some standard satellites and historical time series on e.g. economic growth, productivity and government finance. As a consequence of such extensions a more balanced and timely picture of the national economy will be given. This will also greatly improve the national accounts as a description and tool for economic analysis and policy.

The *product range* of the national accounts statistics published by the various countries should also *be much more standardized*. At present, the substantial differences in product range do not only reflect differences in national preferences and resources, e.g. the role played by national accounts statistics in the national political-decision-making processes. The differences are also to a great extent the fruit of history, i.e. the direct consequence of the qualities and preferences of the individual data compilers and data users. Furthermore, a much more internationally standardized product range will drastically increase the merits of the national accounts as a tool for analysis and policy. For example, the scope for international comparisons and for communication by means of national accounts statistics will be drastically extended. Furthermore, the costs of communication and acquiring knowledge about the various product ranges will be substantially reduced, as there are significant economies of scale.

## **10.4 Marketing and education**

### *Marketing*

Like most public services, national accounts statistics are commonly not well marketed. For a monopolistic product this also does not seem necessary. However, the trend towards more market-oriented government reinforces a drastic improvement in the marketing of the national accounts. This marketing can take various forms: improve the presentation of the national accounts statistics,

link the national accounts statistics better to specific data users and current popular issues, give courses for users of national accounts statistics and ensure all kinds of publicity.

The marketing efforts should stress the central purpose of the national accounts statistics (to provide an overview of the national economy and its major components), make the national accounts an attractive statistic by presenting concrete cases and point to the value added of national accounts statistics to efficient and democratic-decision-making.

This value added is often forgotten by the general public and politicians, while being taken for granted by the statisticians themselves. Here is clearly a task for marketing. For example, it should be stressed that the costs of producing national accounts statistics are relatively small compared to the costs of making wrong or untimely decisions (e.g. mis-estimates of tax revenues, overestimating the importance of an industry for the national economy, misjudging the seriousness of an economic crisis). For the EU-Member States, the costs of producing national accounts statistics are only a very small fraction of the contributions to be paid to the EU on the basis of GNP estimates and the political importance of the national accounts figures for the European Monetary Union is very great.

A good example of the marketing of statistics is the work by Eisner (1989, 1992 and 1994): he has entered public debates on various economic issues, like the government deficit, by stressing what we can learn from statistics.

### *Education*

Decades ago, national accounts statistics were a major innovation for economic policy and analysis. National accounts was developed and stimulated by some of the best economists in the world (e.g. Kuznets, Hicks, Keynes, Tinbergen, Stone, Leontief, Frisch). Education in national accounting became a substantial part of economic curricula. The compilation of national accounts statistics was transferred from individual researchers to official institutes and government bodies. And national accounting concepts were entered into government accounts and official budgetary procedures, forecasts and analyses.

At present the availability of national accounts statistics is taken for granted. Historic memory about the logic, merits and limitations of national accounts statistics is gradually lost without being replaced by new up-to-date knowledge. National accounting is becoming a negligible and very dull part of economic curricula, economic researchers (e.g. those studying economic growth) often lack elementary knowledge of national accounting and national accounting has become a profession entirely separate from other parts of economic science. In contrast, the availability of national accounts statistics has increased substantially. However, hardly no new ways to make use of this relative abundance of data have been developed.

The current situation urgently demands a substantial investment in education. The general knowledge of data users and compilers should be raised and it should be made much more easy to acquire more knowledge and information (e.g. about the concepts and data sources used) when needed.

International and national courses should be developed for various groups of data users and at various levels. These courses should be very explicit about the four different roles played by the national accounts and about the logic, merits and limitations of national accounts statistics.

Furthermore, considering its importance for private and public decision-making, national accounting should get a more prominent place in economic curricula and in economic research. More attention should be paid to the differences and similarities between economic theoretic concepts, administrative concepts (e.g. business accounts and tax data) and national accounting concepts.

These investments in education will reduce misinterpretation, will increase interaction between data compilers and data users and can substantially lower the threshold for investing in knowledge about the national accounts, e.g. for economic researchers. In the long run, this will also improve the national accounts as a description and tool for analysis and policy.

## 10.5 Summary

In order to meet the challenges and dangers of the future the efficiency and the national accounts as a product should be improved. Furthermore, marketing and education should be taken up seriously.

The efficiency of the national accounts could be improved by:

- An international long term strategy for improving national accounts compilation techniques;
- A more efficient relationships with data sources, e.g. better coordination, international quality standards for various basic statistics and joint statistical products;
- A better balance between the compilation process and the outputs, e.g. by reconsidering the output in view of non-official efforts to compile national accounts statistics (e.g. time series!) or by the use of explicit thresholds for making separate estimates or for splitting units in the business register.

The national accounts as a product could be improved by:

- Some changes in the basic concepts in the international guidelines (see section 6.10);
- More satellites for specific purposes. Some of these could contain internationally standardized supplementary concepts, like entrepreneurial income after tax, government expenditure and revenue or household income in cash (see section 6.10). They may also contain modelling results, as modelling is often essential for a balanced view on the national economy;
- An international, EU-like, program for increasing the reliability and comparability of major national accounts variables (e.g. Domestic Product and the volume growth of Domestic Product).
- An international, EU-like, program for extending and standardizing the product range of national accounts statistics all over the world.
- An international long term strategy investigating the proper use and misuse of national accounts statistics and their concepts in general. This international strategy should focus on:
  - o research on national accounting concepts in view of economic theoretic concepts and administrative concepts;
  - o investigation of user practice and the lessons that can be learned from that. This can improve the use of the national accounting statistics and concepts. It could also offer suggestions to make the national accounts more relevant for major specific uses.
- Supplementing national accounts statistics with information about their reliability and meaning, e.g. about the operational concepts, the data sources, compilation methods, the size of the differences between successive estimates and the results of various types of sensitivity analyses.
- Supplementing national accounts statistics with information about the role of specific events and institutional circumstances and changes.
- A better presentation of national accounts statistics, e.g. reduce the publication of the many marginally different concepts of Domestic Product, get rid of the publication of fake data and establish explicit links with software conducting standard analyses.

In order to clarify the value-added of national accounting and to fight wide-spread illiteracy in national accounting, marketing and education should be taken up seriously, preferably by an international long term strategy and by making use of all the possibilities of internet.



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