



Munich Personal RePEc Archive

Tax burden by economic function A comparison for the EU Member States

De Laet, Jean-Pierre and Wöhlbier, Florian
European Commission, Taxation and Customs Union
Directorate General

01. December 2008

Online at <http://mpra.ub.uni-muenchen.de/14761/>
MPRA Paper No. 14761, posted 21. April 2009 / 10:39

Tax burden by economic function
A comparison for the EU Member States *

Jean-Pierre De Laet and Florian Wöhlbier **

December 2008

Draft version

Abstract

Policy makers as well as taxpayers are interested in comparing the tax burden in their countries with others, particularly given the wide variations in taxation levels and policies. In order to assess the heterogeneous national tax systems on a fully comparable basis, it is essential to have a unified statistical framework. This paper presents key trends in the tax burden in the Member States of the European Union, based on the European Commission's report 'Taxation trends in the European Union'. The main focus lies on analysing the tax burden by economic function (i.e. consumption, labour and capital). The paper presents the methodology that is applied in order to allocate the tax revenue of the different taxes to the economic functions. Moreover, we present measures for the average effective tax burden on different types of income or activities, the so-called implicit tax rates. Results of the calculations are presented looking both at differences between Member States and trends over time.

Key words: tax burden, tax indicators, effective tax rates.

* The findings, interpretations, and conclusions of this paper should not be attributed to the European Commission.

** European Commission, Taxation and Customs Union Directorate General, e-mail: Jean-Pierre.De-Laet@ec.europa.eu and Florian.Wohlbiel@ec.europa.eu

1. Introduction

Taxation is at the heart of citizens' relationship with the State. Taxpayers as well as politicians are interested in the development of the overall tax burden overtime and the question how their respective country compares to others. For these analyses an unbiased reference in the debate on taxation in Europe, which allows full cross-country comparability, is of importance. The European System of National and Regional Accounts ESA 95, which contains data on tax revenues and revenues from social security contributions, provides such a reference.

This paper is based on the report 'Taxation trends in the European Union: Data for EU Member States and Norway' (see European Commission, 2008a)¹, which contains an analysis of trends in the tax burden over time and a comparison among EU Member States. The paper also presents a classification of the tax structure by economic function (i.e. labour, consumption and capital) and measures for the average effective tax burden on different types of income or activities.

The remainder of the paper is organised as follows. Section 2 presents the methodology for the analysis of the overall tax burden, the revenue structure by type of tax and by level of government as well as the respective key results for the 1995-2006 period. Section 3 explains the methodology applied for the classification of the tax burden according to economic function and analyses the results. In section 4, the concept of the so-called implicit tax rates, measuring the effective tax burden on different types of economic income or activities, is explained. Moreover, results are presented. Section 5 concludes.

¹ An international comparison of tax revenues is also published by the OECD (see OECD, 2008a), containing data for the OECD member countries. In contrast to European Commission (2008a) and this paper, the OECD does not strictly follow the system of national accounts in their calculations.

2. Measurement of the overall tax burden

2.1 Methodology

The data presented are computed on the basis of a methodology allowing full cross-country comparability. The methodology is based on the European System of National and Regional Accounts (ESA 95)². The results presented in this part are available in the Eurostat database³. Directly using the information on tax revenue contained in ESA95, the Member States can be compared as regards the overall tax-to-GDP ratio, the structure of taxation by type of tax (direct taxes, indirect taxes and social security contributions) as well as by level of government. Moreover, the developments over time can be analysed.

Before looking at the disaggregation of the overall tax burden, it is important to clarify what is contained in the definition of the overall tax burden used in this paper. The definition applied in this paper, which is based on the ESA95 classification, is presented in Table I:⁴

Table I – Total Taxes (incl. compulsory social security contributions)⁵

D.2	Taxes on production and imports
+ D.5	Current taxes on income, wealth, etc.
+ D.91	Capital Taxes
+ D.6111	Actual social contributions
- D.6112	Voluntary employers' actual social contributions
- D.6122	Voluntary employees' actual social contributions
- D.6132	Voluntary contributions by self and non-employed persons
(- D.995	Capital transfers from general government to relevant sectors representing taxes and social contributions assessed but unlikely to be collected

It is in particular important to note that in the definition of the overall tax burden applied here, taxes and compulsory actual social contributions are included. Whereas taxes can be defined as unrequited, compulsory payments levied by general government (or by the Institutions of the European Union), compulsory social contributions are in general not unrequited as they at

² See Eurostat (1996) for a detailed description of ESA95 system.

³http://epp.eurostat.ec.europa.eu/portal/page?_pageid=1996,45323734&_dad=portal&_schema=PORTAL&screen=welcomeref&open=/data/economy/gov/gov_a&language=en&product=EU_MAIN_TREE&root=EU_MAIN_TREE&scrollto=0, section 'Main national accounts tax aggregates'. The data can also be found in European Commission (2008a) or accessed via the following webpage: <http://ec.europa.eu/taxtrends>.

⁴ Note that Eurostat also publishes data on the overall tax-to-GDP ratio using a slightly broader definition of overall tax revenues, which also includes voluntary (D.6112, D. 6122, D. 6132) and imputed social contributions (D. 612) (see Eurostat, 2008). The difference between the two measures amounts to around 1½ % of GDP on the European Average and is quite stable over time.

least to some extent allow access to potential future services (as in the case of the health insurance) or future payments (as in the case of the old-age insurance).⁶ Compulsory actual social contributions are included in the definition of the overall tax burden used here, as – at least in many cases – the value of the services provided is not or not directly linked to the level of social contribution payment. They do therefore often have a tax-like character.⁷

Another question that is often subject to discussion is, in how far fees etc. are included in the definition of total taxes. Following ESA95, payments for licences etc. are only included in the tax revenues if they are paid by households for the use of vehicles, boats or aircraft, or licences to hunt, shoot or fish or by enterprises for business and professional licences that are automatically granted on payment of the amount due. Other licences are only treated as taxes in so far as the amount charged for the licence is 'clearly out of all proportion to the cost of providing the services'.⁸

The probably most common way to classify tax revenues is the distinction of indirect taxes, direct taxes and social contributions. The terms as such are not used in the ESA95 system, in which taxes are identified according to their purpose (see Table 1). The groups are defined in the following way:⁹

- In general terms, indirect taxes are all taxes levied on the production or consumption of goods and services as well as on transactions. They are defined as the sum of the taxes in D.2 of the ESA95 system.
- Direct taxes are typically based on the taxpayer's ability to pay as measured by income and wealth. In the definition used here they include current taxes on income and wealth (D.5) and capital taxes including taxes such as the inheritance and gift taxes (D.91).
- Social (security) contributions include payments made in respect of insurance against social risks or needs. As used in this paper, they include actual compulsory contributions paid by employers (D.61111), employees (D.61121) and self- and non-employed (D.61131).

⁵ A detailed list of the ESA95 classification of taxes and social contributions is presented in the Annex.

⁶ Data for total taxes (excluding social contributions) is also published (see European Commission, 2008a) and regularly referred to in some Member States (see Bundesministerium der Finanzen, 2008).

⁷ For a discussion of the tax-like character of social security contributions see Elschner et al. (2006).

⁸ See Eurostat (1996) for a detailed discussion.

⁹ Definitions used in the Member States might deviate from the one used here.

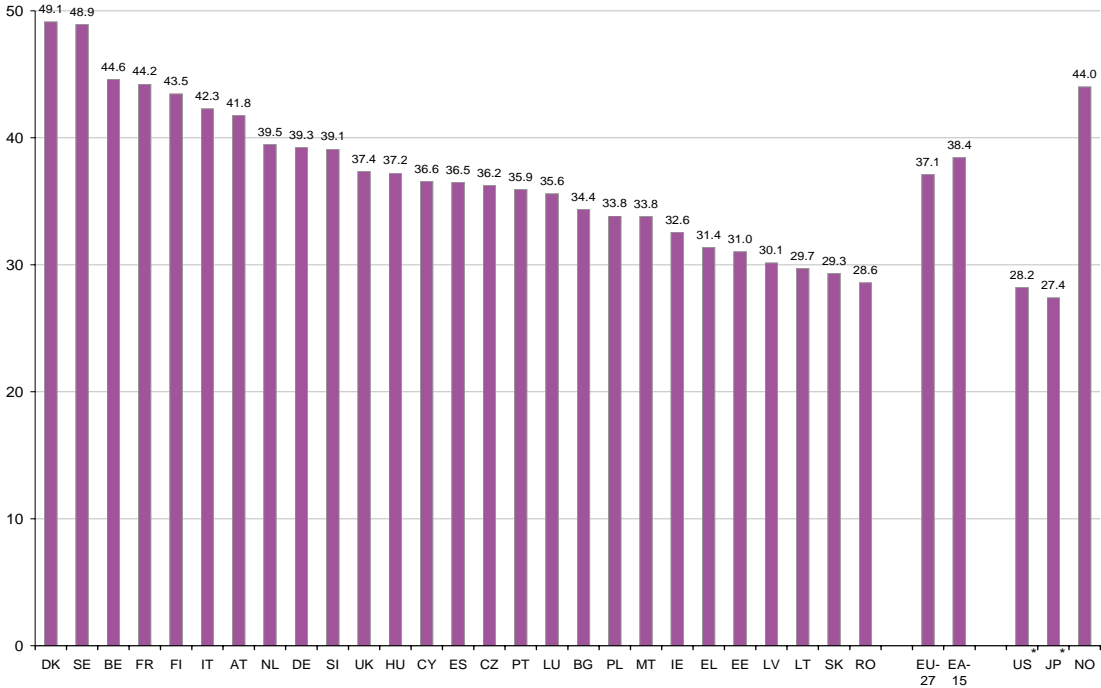
Finally, the tax level is often split by the level of government ultimately receiving it. In the ESA95 framework, the sector general government (S.13) includes four levels: the central government (S.1311), the state (region) for federal states (S.1312), local governments (S.1313) and social security funds (S.1314). The overall tax revenues also includes tax revenues received by the EU institutions (S.212).

2.2 Results

Graph I illustrates the important variations in tax burden within the European Union. A difference of more than twenty percentage points can be noticed between Denmark, where the tax burden was the highest in 2006, and Romania, where the tax burden is the lowest. In 2006, the arithmetic average of total tax-to-GDP ratio reached 37,1% in the EU 27 or about ten points of percentage higher than the corresponding ratio in the US or Japan. The average tax burden in the EU 25 increased between 1995 and 1999 by 0.5 percentage point (arithmetic average) and 1.4 percentage points (GDP-weighted average). The trend reversed during the period 2000-2003. A significant increase was again noticed in 2005 and 2006, bringing the indicators close to their initial values. Large Member States have increased tax burdens more than small Member States.

Graph I - Total tax burden (incl. social contributions)

2006, in % of GDP, arithmetic averages

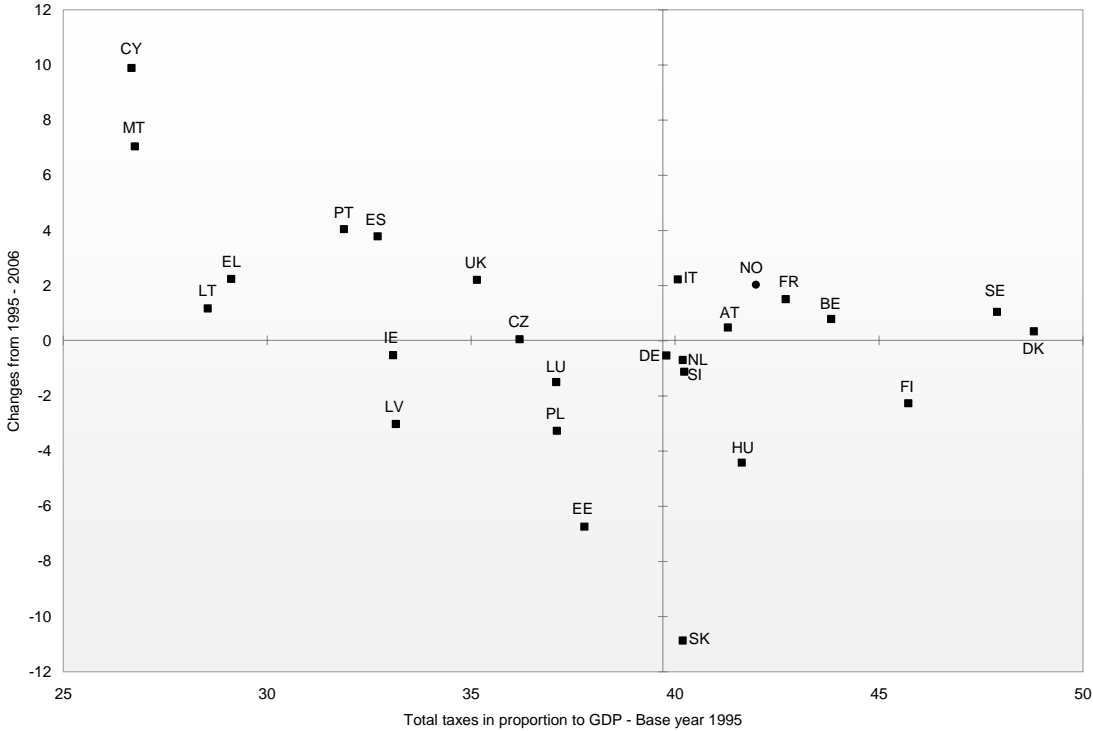


Source: Commission Services, OECD for the US and Japan

Graph II displays the changes in the tax-to-GDP ratios between 1995 and 2006 in percentage points of GDP, in comparison to the original levels in the base year 1995. The top half includes those Member States which have seen their overall tax ratio increase since 1995, while the right-left dimension identifies the starting point at the beginning of the decade compared with the 1995 mean; that is, countries that at the beginning of the period displayed higher-than-average total tax ratios are in the right half and vice versa. The Member States in the upper-left quadrant, e.g. had a tax-to-GDP ratio below the EU-25 average in 1995, but have increased the ratio in the 1995-2006 period.

Graph II - Changes in total tax burden

1995-2006, in %



Source: Commission Services

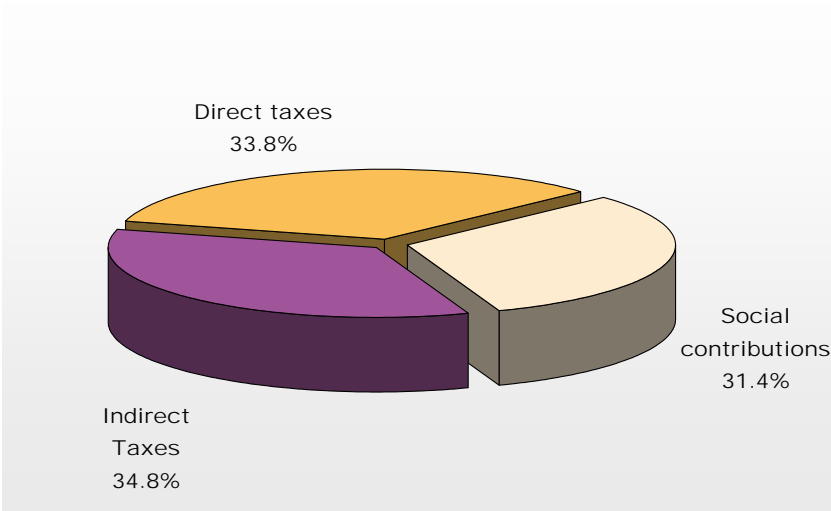
As can be seen from Graph II, more Member States have increased their tax ratios (14) than reduced it (11). The left part of the graph displays more important changes: Member States witnessing a lower than average tax burden in 1995 have more frequently carried out significant policy changes. Cyprus and Malta have increased their tax-to-GDP ratio respectively by 9.9 and 7 points of percentage while Slovakia and Estonia have reduced it by 10.9 and 6.7 points. Among the 11 Member States which had a lower tax-to-GDP ratio in 2006 than in 1995, 6 have joined the EU in 2004. The tax-to-GDP ratio has increased in

several large Member States: by 3.8 points of percentage in Spain, 2.2 in Italy and the UK and 1.5 in France.

Graph III displays for the EU-27 the broadly similar shares of revenues raised from direct, indirect and social contributions. However, individual Member States have very different structures according to the type of tax. New Member States tend to rely to a smaller extent on direct taxation. Direct taxes only account for around 20 % of total revenues in Bulgaria, Romania and Slovakia while they represent more than 60% in Denmark. The share of indirect taxes varies from 30% in the Czech Republic and Belgium to 56.5% in Bulgaria. Social contributions only bring 2% of total revenues in Denmark, but 44% in the Czech Republic.

Graph III - Revenue by major type of tax

EU-27, weighted averages, 2006

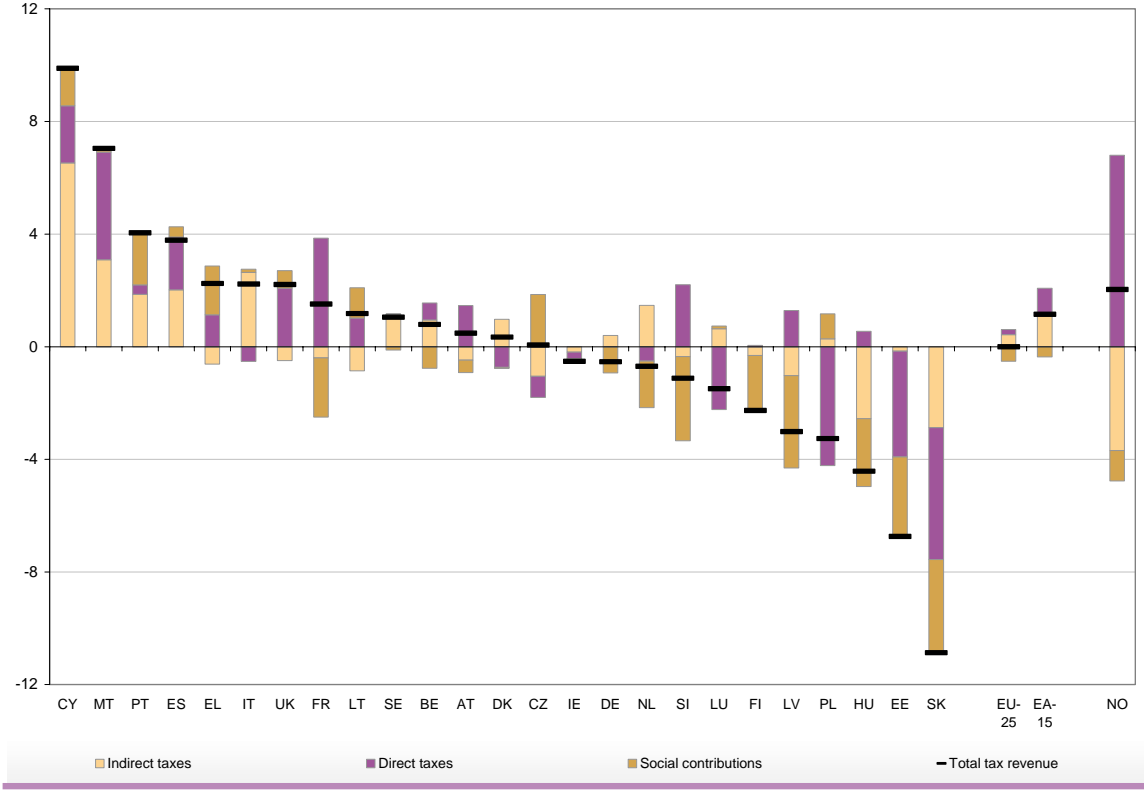


Source: Commission Services

The developments between 1995 and 2006 in the tax-to-GDP ratios for the different taxes are illustrated in Graph IV (the black line represents the sum of the changes of the different components as a percent of % GDP). The structure has remained broadly unchanged at the level of the EU-25 for which data is available for the whole period considered. Much more change can be noticed at the level of individual Member States. The Czech Republic and Poland have decreased taxes and increased social contributions while France, Slovenia, Latvia and the Netherlands have implemented opposite reforms. Some Member States have also increased or reduced all types of revenues as exemplified by Slovakia and Cyprus and Slovakia at both ends of the graph.

Graph IV - Evolution by major type of taxes

1995-2006, differences in % of GDP

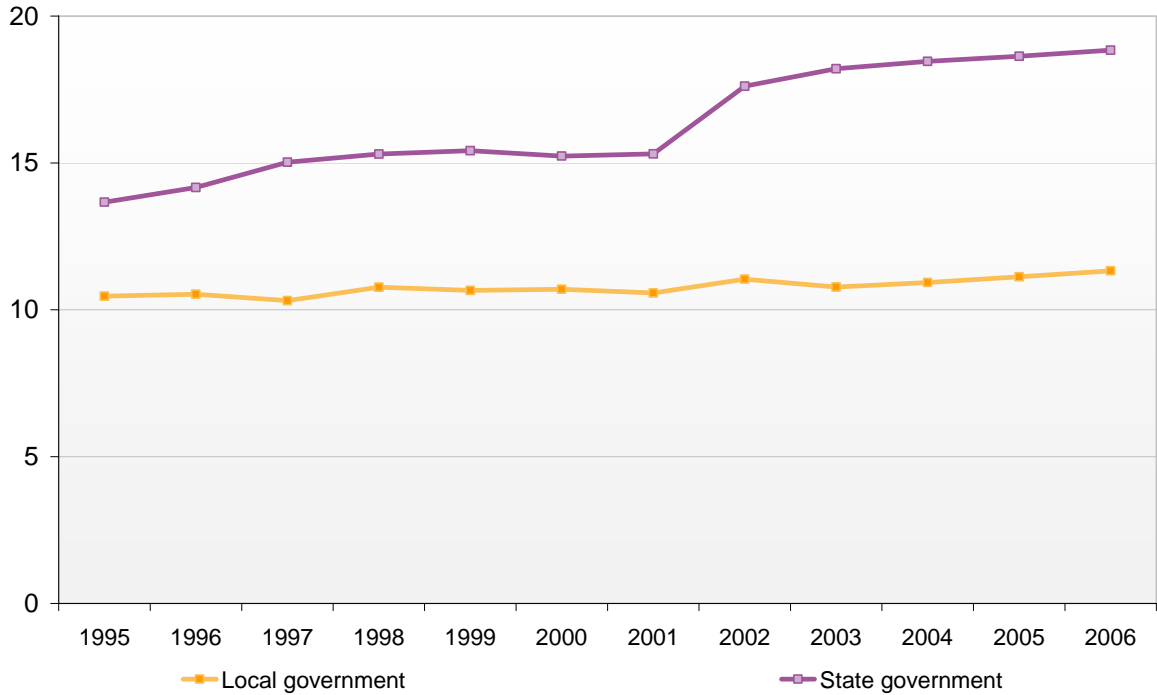


Source: Commission Services

Note: Romania and Bulgaria are not included as no data is available for a substantial part of the time series.

State or sub-federal Governments only exist in part of the Member States (Austria, Belgium, Spain, Germany). As illustrated in Graph V, their share of revenues has increased significantly during the period 1995-2006. Spain has in particular witnessed in 2002 an increase of more than 10 percent of total taxes of the share of taxes collected by state governments. Smaller developments are noticed as far as local governments are concerned. Revenues of local governments have increased in relation to GDP in Romania, Slovakia and Italy while a decrease took place in Bulgaria.

Graph V - Share of total tax revenue: local and state government



Note: Averages of Member States with respective level of government

Source: Commission Services

3. Distribution of the tax burden according to economic function

3.1 Methodology

The interpretation of the tax-to-GDP ratio as an indicator for the tax burden requires additional information. In order to have a better picture of the tax burden, an economic classification of taxes is presented. Taxes are classified as taxes on consumption, labour and capital. In the case of labour and capital a more detailed breakdown is available (see below). The classification refers to the question on which kind of economic income or activity a tax is levied. It does, however, not reflect the final economic incidence of a tax which might be different. The economic classification of taxes is not standard and is computed specifically for the publication 'Taxation trends in the European Union' (European Commission, 2008a). It has been developed jointly by statisticians from Eurostat and economists from the European Commission's Directorate-General for Taxation and the Customs Union.¹⁰ They were

¹⁰ The methodology has already been applied in several editions of the report 'Structures of the tax systems in the European Union', which is the predecessor of the report 'Taxation trends in the European Union'.

supported in this task by the national Statistical Offices and the Ministries of Finance of all countries covered.¹¹

For the analysis more detailed tax revenue data provided by the Member States is used. In this part of the paper, the general rules used for the allocation of the taxes will be presented. It will be explained which ESA95 subcategories are, as a rule, allocated to which economic function. In several cases, however, the real classification of a tax deviates from the standard classification if the true nature of a tax requires it. Moreover, some taxes are not imposed on one economic activity but the revenues relate to multiple sources of economic income. This holds most notably for the personal income tax. In these cases, the revenue from a tax is split between several economic classifications. In the case of the personal income tax, a so-called PIT-split is calculated by the Member States authorities, which breaks down the tax revenue into four sources of taxable income: labour (employed), capital, self-employment income, and social transfers and pensions (labour non-employed) according to a country specific methodology. Depending on the data availability in a Member State, different methods are applied: the calculations are either based on 'data-sets for individual taxpayers', 'income class data based on data-sets of individual taxpayers' or 'tax receipts data from withholding- and income tax statistics'.

In the following we will focus on the general rules applied for the classification of taxes and not on the discussion of borderline cases. Taxes on consumption are defined as taxes levied on final consumption goods. The following categories of the ESA95 classification are considered as taxes on consumption:

¹¹For a detailed discussion of the methodology see also European Commission (2008a, Annex C).

Table 2 – Taxes on Consumption

D.211 Value added type taxes
D.212 Taxes and duties on imports excluding VAT
D.214 Taxes on products except VAT and import duties less
D.214b Stamp taxes
D.214c Taxes on financial and capital transactions
From D.29 Other taxes on production:
D.29d Taxes on international transactions
D.29f Taxes on pollution
D.29g Under-compensation of VAT (flat rate system)
From D.59 Other current taxes:
D.59b Poll taxes
D.59c Expenditure taxes
D.59d Payments by households for licences

Taxes on labour comprise of taxes on labour employed and on non-employed labour (i.e. transfer income). Taxes on employed labour include all taxes, which are directly linked to wages and mostly withheld at source. Both taxes paid by employers and employees are counted, including compulsory actual social contributions (see Table 3).

Table 3 – Taxes on labour employed

From D.51 Taxes on income:
D.51a+D.51c1 Taxes on individual or household income including holding gains (part raised on labour income)
From D.29 Other current taxes:
D.29c Total wage bill and payroll taxes
From D.611 Actual social contributions:
D.61111 Compulsory employers' actual social contributions
D.61121 Compulsory employees' actual social contributions

Under the definition of taxes on employed labour income adopted here, the categories 'personal income tax' and 'social security contributions' are used in a wide sense. They also include other taxes that are felt to increase the cost of labour, such as payroll taxes or specific surcharges on the personal income tax levied in some Member States.

Taxes on labour-non employed (see Table 4) include all those taxes and compulsory social security contributions imposed on the transfer income of the non-employed. Transfers comprise social transfer payments by the state (e.g. unemployment- or health care benefits) and benefits from old-age pension schemes (both state and occupational pension schemes).

This can be justified by the fact that most of the transfers paid to non-employed people are somewhat linked to previous employment.

Table 4 – Taxes on labour non-employed

From D.51 Taxes on income:
D.51a+D.51c1 Taxes on individual or household income including holding gains (part raised on social transfers and pensions)
From D.611 Actual contributions:
D.61131 Compulsory social contributions by self- and non-employed persons (part paid by social transfer recipients)

Taxes on capital include taxes imposed on capital and business income in a broad sense (see Table 5) as well as taxes on the stock of capital (wealth) or the transfer of capital (see Table 6).

Table 5 – Taxes on capital and business income

From D.51 Taxes on income:
D.51a+D.51c1 Taxes on individual or household income including holding gains (part paid on capital and self-employed income)
D.51b+D.51c2 Taxes on the income or profits of corporations including holding gains
D.51c3 Other taxes on holding gains
D.51d Taxes on winnings from lottery and gambling
D.51e Other taxes on income n.e.c.
From D.611- Actual social contributions:
D.61131 Compulsory social contributions by self- and non-employed persons (part paid by self-employed)

Table 6 – Taxes on stocks (wealth)

From D.214 Taxes on products, except VAT and import taxes:
D.214b Stamp taxes
D.214c Taxes on financial and capital transactions
From D.29- Other taxes on production:
D.29a Taxes on land, buildings or other structures
D.29b Taxes on the use of fixed assets
D.29e Business and professional licenses
D.29h Other taxes on production n.e.c.
From D.59 Other current taxes:
D.59a Current taxes on capital
D.59f Other current taxes on capital n.e.c.
D.91 Capital taxes

The taxes on capital and business income can again be split between those levied on the income of corporations and those imposed on the income of households and self-employed.

3.2 Results

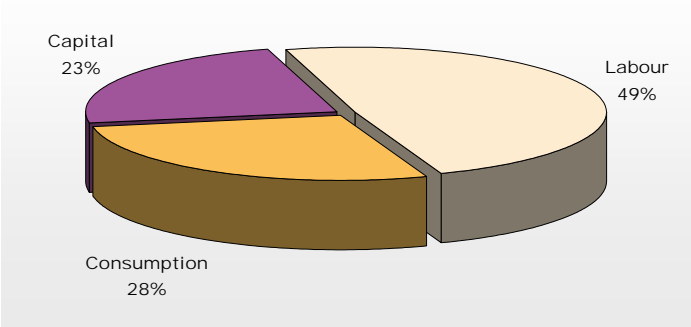
Graph VI displays the shares of revenue broken down by economic function in the EU-27. Overall the taxes levied on labour income account for around 49% of the total while the share of taxes levied on consumption and capital represent respectively 28% and 23%. The share of consumption taxes is higher in the Member States that have joined the Union in the last two enlargement rounds. On the other hand, Italy, France Belgium and Sweden have low shares of consumption taxes.

The importance of labour taxes is highlighted by the fact that fifteen of the EU Member States derive around half their revenue from labour taxes: twelve raise between 48 % and 53 % of the total, while Sweden, Germany and Austria obtain more than 55 %. The bottom half of the distribution is more dispersed, with Bulgaria raising the least amount of financing from labour, a mere 28.5 % of the total.

The share of revenue yielded by capital taxes is large in the United Kingdom, Ireland, Luxembourg, Spain, Malta, Cyprus, Italy and Poland, where they contribute over one quarter of total taxes, and noticeably small in the Baltic Republics, Hungary, and Slovenia with less than one seventh. As for their composition, taxes raised on capital and business income are generally more important than taxes on stocks of capital/wealth; one important exception is France, where high taxes on wealth lead to broadly equal proportions between the two types. In the recently accessed Member States, these taxes by and large yield a lower share of revenue than in the EU-15; this might be linked, however, to a lower aggregate value and productivity of the capital stock.

Graph VI - Revenue by economic function

EU-27 weighted averages, 2006

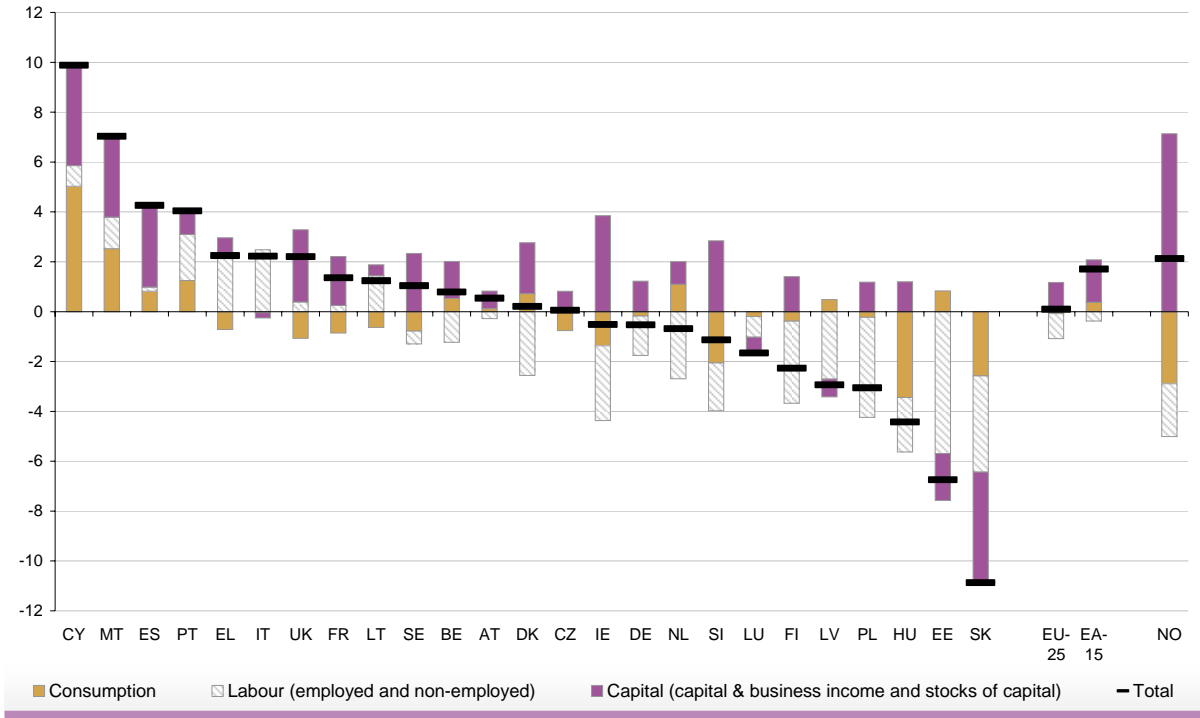


Source: Commission Services

The distribution of the overall tax burden by economic function has undergone some important changes since the mid-1990s, and the pattern is rather mixed across Member States (see Graph VII). On average for the EU-25, an across-the-board – partly cyclically induced – increase in capital taxes as a percentage of GDP to the highest levels since 1995 can be noticed as well as a slight decline of labour taxes since the late 1990s. Labour taxes have indeed significantly increased only in six Member States, while in sixteen others they contributed in a non-negligible way to reducing overall taxation. Despite significant changes in many Member States, consumption taxes as % of GDP are, on average, at about the same level in 2006 as in 1995.

Graph VII – Relative contribution of taxes on labour, capital and consumption to the change in the total tax-to-GDP ratio, by country

1995-2006, in % of GDP



Source: Commission Services

Note: Romania and Bulgaria are not included as no data is available for a substantial part of the time series.

4. Implicit tax rates on consumption, labour and capital

The disaggregation of tax revenues by economic function as a proportion of GDP (or share of total taxation) only provides limited information on the real tax burden imposed on consumption, labour or capital. One potential reason for a, e.g., relatively high share of labour taxes in GDP (or in total taxation) in a Member State could, of course, be high personal income tax rates or social contributions. However, high revenues from labour taxes could also be due to a relatively large share of labour income in GDP, which again could be a consequence of permanently high levels of employment in a Member State or high employment levels due to the business cycle. Therefore, so-called implicit tax rates (ITRs) are calculated in order to provide better information on the tax burden on an economic activity.

4.1 Methodology

ITRs measure the effective average tax burden directly or indirectly levied on different types of economic income or activities that could potentially be taxed by Member States. Aggregate tax revenues are expressed as a percentage of the potential tax base. ITRs enable a monitoring of tax burden levels over time (e.g. to identify so-called tax shifts from one type of economic activity to another) and across countries. While the information on the tax revenue is calculated by using more detailed tax data than provided in ESA95 (see part 3.1), the calculation of the potential tax base follows the ESA95 classification and only involved data that is available from the Eurostat database. In this section the ITRs for the different economic functions are introduced. The objective is to give an understanding of the key features of the ITRs.¹²

The ITR on consumption is defined as follows:

$$ITR_c = \frac{\textit{Taxes on consumption}}{P31_S14dom}$$

All taxes on consumption as defined in section 3.1 are put in relation to the final consumption expenditure of households on the economic territory, using the domestic concept (P31_S14dom). This implies that the tax base is broader than the legal base applied in the Member States. The ITR on consumption not only includes the VAT but also a number of other taxes imposed on consumption. In order to provide a more detailed picture, the

¹² A more detailed discussion can be found in European Commission (2008a).

numerator of the ITR on consumption can be disaggregated into four categories: The VAT component, the energy component (which includes excises on motor vehicle fuels), the tobacco and alcohol component and a residual. Strictly speaking only the VAT component can be regarded as an implicit tax rate. The other components are biased to a certain extent, because they are taxes levied on specific goods and thus their tax base is only a small portion of the final consumption. Although necessary to obtain an additive breakdown of the ITR, this fact should be borne in mind.

A better insight into the peculiarities of the VAT tax bases in the Member States' tax systems is provided by a specific indicator representing the difference between the generally applicable statutory VAT rate (disregarding reduced rates) and the VAT component of the ITR on consumption. This indicator, which is called "VAT reduced rate and base indicator", aims at giving a snapshot of the extent by which a given VAT system approximates a "pure" consumption tax, characterised by a flat rate and the widest possible tax base (i.e. the entire value of private consumption without exemptions). A low value of this indicator suggests that the VAT tax base approximates the value of private consumption and hence reduced rates and VAT exemptions play a minor role, while a high value represents an indication that a substantial share of private consumption is spared from taxation at the standard VAT rate. Other factors contributing to a high indicator value could also be a high registration threshold for VAT, implying taxation of only a share of intermediate consumption and not taxing value added by SMEs below the threshold as well as significant levels of VAT evasion or avoidance.

The ITR on labour is only calculated for employed labour. For the calculation all taxes on employed labour income (as defined in section 3.1) are put in relation to the sum of the compensation of employees (D.1) and wage bill and payroll taxes (D.29c):

$$ITR_L = \frac{\text{Tax on labour (employed)}}{D1 + D29c}$$

It is important to note that an increase in the ITR on labour can be due to other effects than an increase in tax rates or social contributions. High inflation and real growth move employees into higher income brackets and therefore lead to an increase in the average tax rates in case the brackets are not adjusted for inflation. Cyclical effects therefore can also have an impact on the ITR on labour. The ITR on labour can be disaggregated into three component: the PIT

component, a component containing the social contributions paid by the employees and one including employers' social contributions and payroll taxes.

In the case of capital, different ITRs can be distinguished: ITR on capital, ITR on capital and business income, ITR on corporate income, ITR on capital and business income of households. In all cases, the numerator is based on the taxes on capital as defined in section 3.1. As concerns the denominator, the calculation is much more complex than in the case of the ITRs on consumption and labour. It requires the detailed use of ESA95 sectoral accounts data.

The (overall) ITR on capital aims at measuring the average tax burden on capital and is '...computed as the ratio between revenue from all capital taxes, and all (in principle) potentially taxable capital and business income in the economy...' (European Commission, 2008a, page 412). It should be interpreted with caution as its trend reflects many different factors.

In very general terms, the (overall) ITR on capital can be defined as follows:

$$ITR_{capital} = \frac{\text{Taxes on capital(income)}}{\text{potentially taxable capital income}}$$

When looking at the overall ITR on capital it has to be born in mind that the numerator includes both taxes on capital income and stocks of capital (wealth), whereas the denominator only refers to capital income that is included in the system of national accounts. The ITR on capital and business income only contains taxes on capital and business income in the numerator and has the base with the overall ITR on capital in common. Nevertheless, the denominator still deviates from taxable profits. Whereas capital gains are not included in the definition of profits in the system of national accounts (as they are not related to the production process), they can constitute an important part of taxable profits of (financial) companies. This problem also applies to capital gains of households. As a consequence, the ITR on capital and business income is overestimated if capital gains are taxed. Moreover, the profits of central bank are included in the denominator but in general not in the numerator, which leads to an underestimation of the ITR. Another aspect that seems important is the aspect of losses. Whereas losses carried forward lead to a reduction of taxable profits and tax revenues, they do not have an impact on the net operating surplus in national accounts. This leads to a cyclical mismatch with the base and a cyclical fluctuation in the ITR. These aspects

sometimes make the trend in the ITR difficult to interpret and have an impact on international comparisons. Finally, not only problems in the interpretation have to be faced but also in the availability of data needed for its calculation. As a consequence ITRs on capital are not available for all EU Member States and for some Member States simplified assumptions have to be made in the calculations.

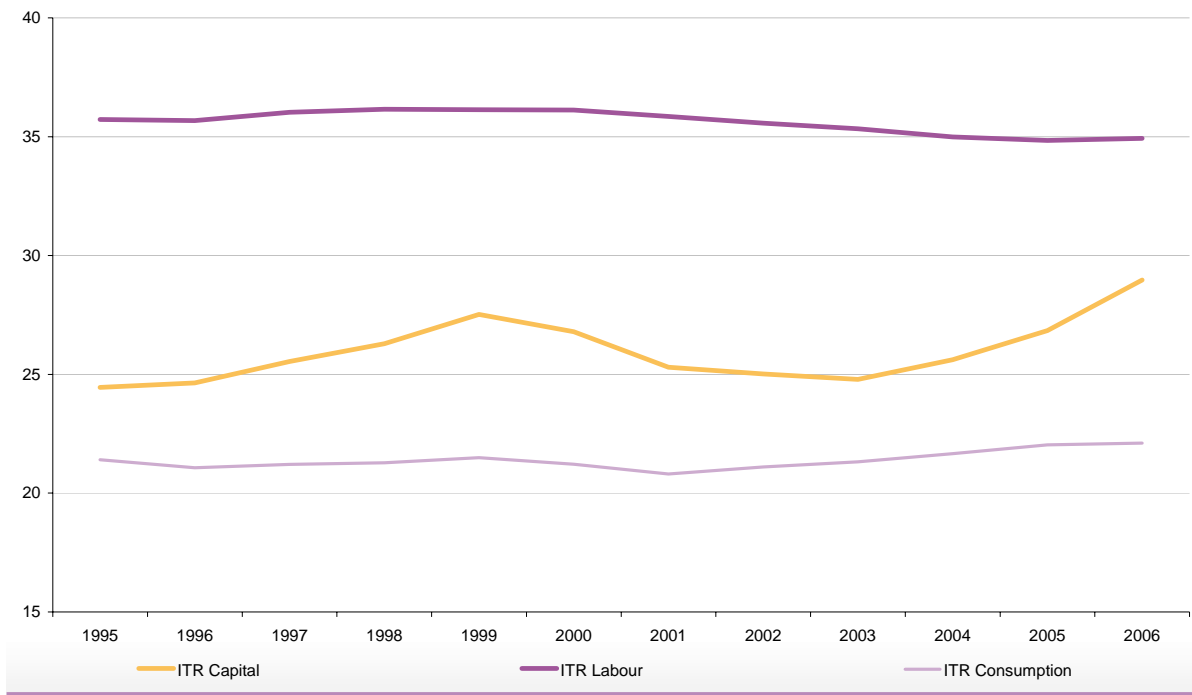
Nevertheless, the ITRs on capital have the big advantage that they not only looks at statutory tax rates and that the base is independent of the tax law applied in the respective Member State. It is, however, important to be aware of the drawbacks and limitations when analysing their levels in different Member States and the trends over time.

4.2 Results

Graph VIII displays the evolution of the three main implicit tax rates, on labour, on consumption and capital, between 1995 and 2006. Average effective tax rates on labour remain well above those for capital and consumption. Despite political intentions to make work pay shared by many governments, the decline in labour taxation stopped in 2005. Effective taxation of capital has significantly increased during the period 1995-1999 and again since 2003. Finally, since 2001 consumption taxation has been trending upwards steadily. More details are provided in the following sections on different aspects of the implicit tax rates on consumption, labour and capital.

Graph VIII – Development of implicit tax rates

EU-25 average, 1995-2006, in %



Source: Commission Services

4.2.1 ITR on consumption

The arithmetic average implicit tax rate on consumption for the EU-25 is 22.1 % for 2006. The lowest ITR on consumption throughout the whole Union is for Spain (16.4 %), followed by Lithuania (16.7 %), Italy (17.2 %) and Greece (17.6 %). In the high consumption taxing countries Denmark stands out with 34.0 %, almost six percentage points above the following Member States – Sweden, Finland, Netherlands and Ireland.

Graph IX displays the disaggregation of the ITR on consumption into four components: VAT, energy, tobacco and alcohol as well as residual. While the VAT component is the largest, the non-VAT component of the ITR is far from negligible in all Member States: it ranges from lows of respectively 27.7 % in Sweden, 29.8 % in Lithuania and 30.0 % in Estonia up to highs of 44.5 % for Luxembourg and 45.5 % in Hungary. The variation in the VAT component of the ITR, while non-negligible, is not as marked as that registered for the other three.

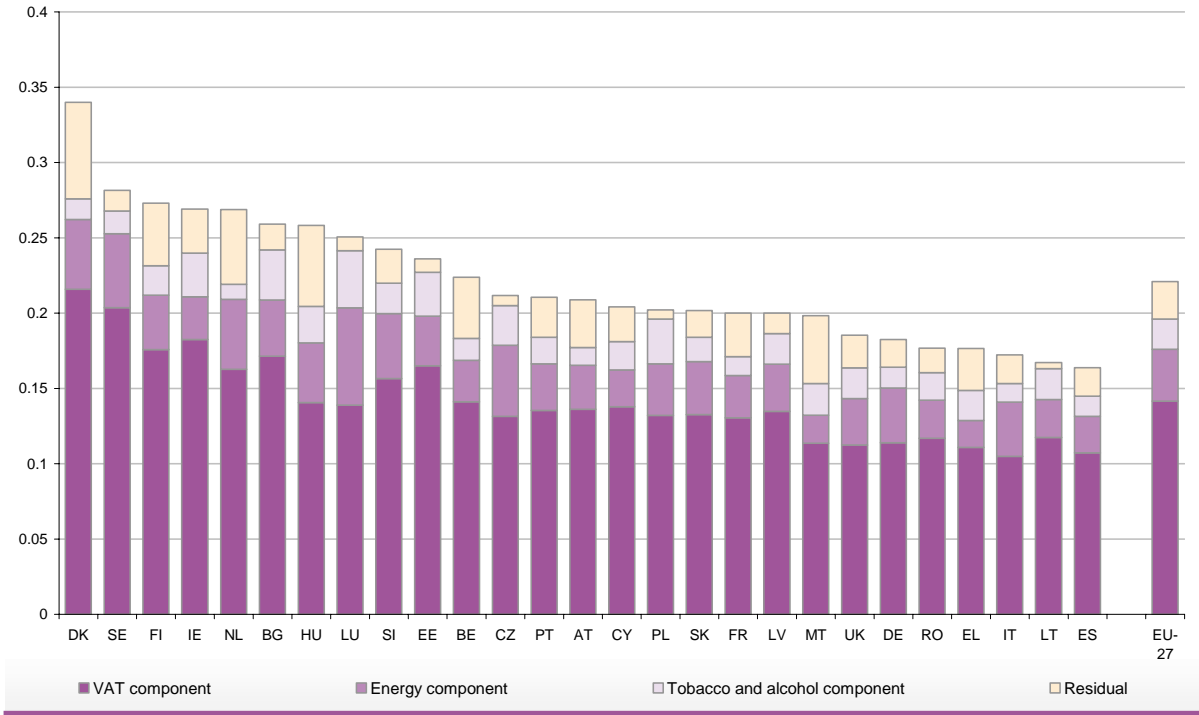
The energy tax component, which includes excises on motor vehicle fuels, usually accounts for between two and five percentage points, the average being 3.4 points. The lowest values are found in Greece and Malta (respectively 1.8 and 1.9 percentage points), while the highest

are found in Luxembourg (6.5 points), followed by Sweden (4.9 points), the Czech Republic (4.7 points) as well as Denmark and the Netherlands (both 4.6 points).

Taxation of alcohol and tobacco amounts to, on average, the equivalent of 2.0 percentage points. The range of variation is however wide, extending from 1.0 percentage points in the Netherlands to 3.8 points in Luxembourg. Other countries where tobacco and alcohol taxes raise little income include Italy and Austria (both 1.2 points) whereas in Bulgaria and Poland this component accounts for a significant portion of the ITR (3.3 and 3.0 points respectively).

The residual component in the ITR on consumption not only varies a lot among member states in size but is also rather heterogeneous. It is largest in Denmark (6.4 %) and Hungary (5.4 %) whereas it is very limited in most of the countries of the Central and Eastern Europe. Denmark stands out for the great number of additional duties, most of which are also pollution and transport taxes.

Graph IX - Disaggregation of ITR on consumption: 2006 results



Source: Commission Services

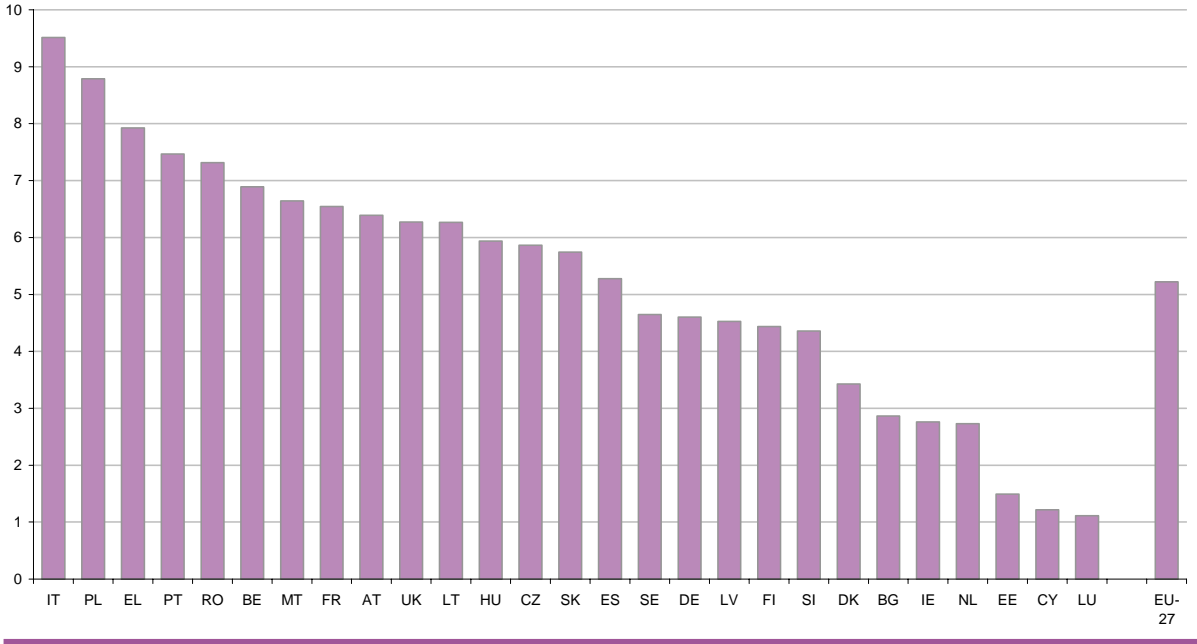
Graph X displays results for the VAT reduced rate and base indicator. In Italy and Poland the indicator reaches around 9 percentage points. A major explanation for the high value of the indicator for Italy lies in the wide application of the reduced (10 %) and super-reduced (4 %) rates; these apply to widely consumed goods and services such as food, transport, books and

periodicals, pharmaceuticals, public facilities, hotel accommodation, restaurant services, and residential housing; the favourable treatment of housing in particular is likely to have a significant impact on revenues. In Poland, as of 2006, the reduced rates are also widely applicable and considerably lower: the super-reduced rate is 3 % and the reduced rate 7 %.

The lowest values (remarkably low at less than 1 percentage point) are attributable to Estonia, Cyprus and Luxembourg. As for Luxembourg, the geographical smallness of the territory and the significant expenditure by non-residents generally make the interpretation of the ITR difficult; revenues from consumption taxes paid by non-residents might therefore be the main cause for its low indicator value. Bulgaria, which maintained until recently a VAT account system notably to fight tax evasion, also displays a low value in 2006 (around 3 %).¹³

Graph X – VAT reduced rate and base indicator

2006, in percentage points



Source: Commission Services

¹³ Bulgaria introduced a VAT account system in 2003 in order to ensure the virtual VAT payments. All VAT-registered businesses were required to open a VAT account, which was separated from other business' cash flows.

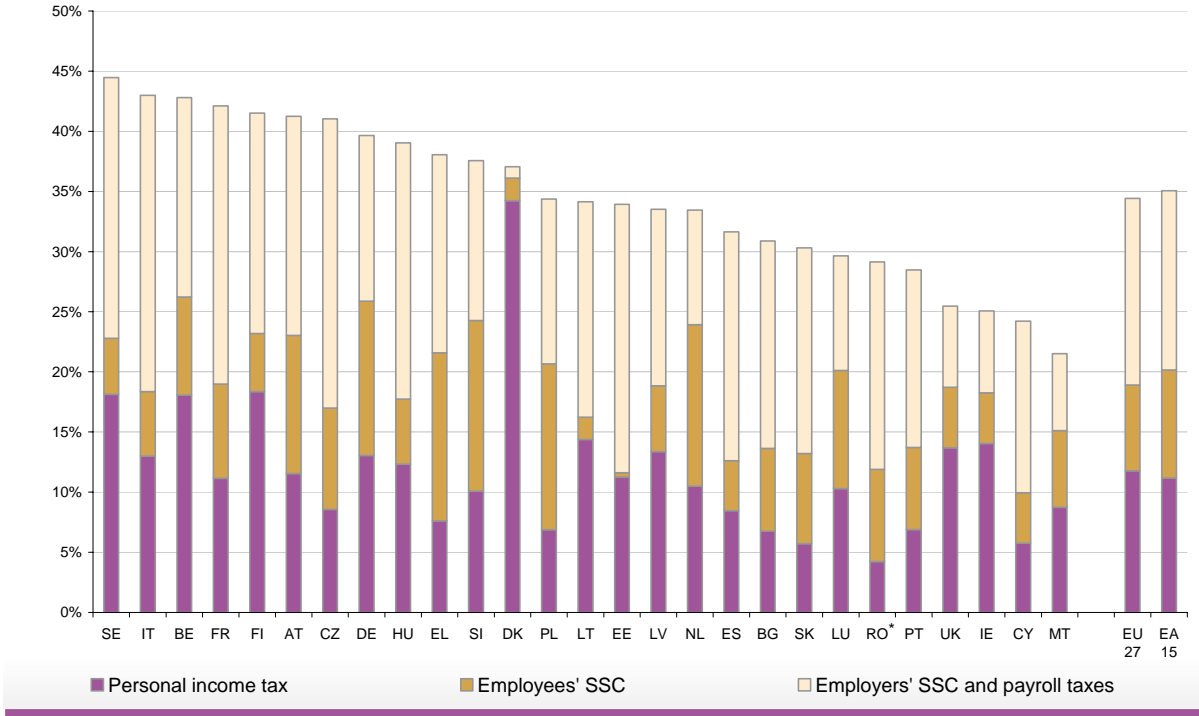
4.2.1 ITR on labour

Making work pay is one of the objectives of the European Employment strategy and reducing tax burden on labour feature on many governmental programmes. Hence the interest for a comparison of the tax burden on labour in the EU Member States (illustrated in graph XI), an analysis of its trends and components. In 2006, the average ITR on labour in the EU-27 reached 34.8%. Malta (21.5%) and Cyprus (24.8%) stand out as the Member States with the lowest ITRs. Ireland and the UK also have much lower than average ITR on labour. On the other hand, in most Continental and Nordic Member States the ITRs on labour exceed the average. The highest tax burden on labour is reported in Sweden, Italy, Belgium France and Finland.

For the majority of the countries in the Union, social security contributions have a higher impact on the level of the ITR than the personal income tax. On average, in 2006 about two thirds of the overall ITR on labour consists of non-wage labour costs paid by both employees and employers. Only in Denmark, Ireland and the United Kingdom personal income taxes account for a relatively large part of the total charges paid on labour income. In Denmark, the share of social contributions in government receipts is very low as most welfare spending is financed by general taxation¹⁴. The relatively low tax burden on labour in Ireland and the United Kingdom can largely be explained by the relatively low shares of the social contributions in these countries. In Slovakia, Greece, Poland, Romania (2005), and the Czech Republic, only about 20 % or less of the ITR on labour consists of personal income tax.

¹⁴ A large part of employees' social contributions in Denmark comes from an 8 % contribution paid on the basis of employees' gross earnings. Some studies classify this revenue as a social security contribution, while others report it as a separate type of personal income tax.

Graph XI – Implicit tax rate on labour: decomposition 2006



Note: Data for Romania refers to 2005.

Source: Commission Services

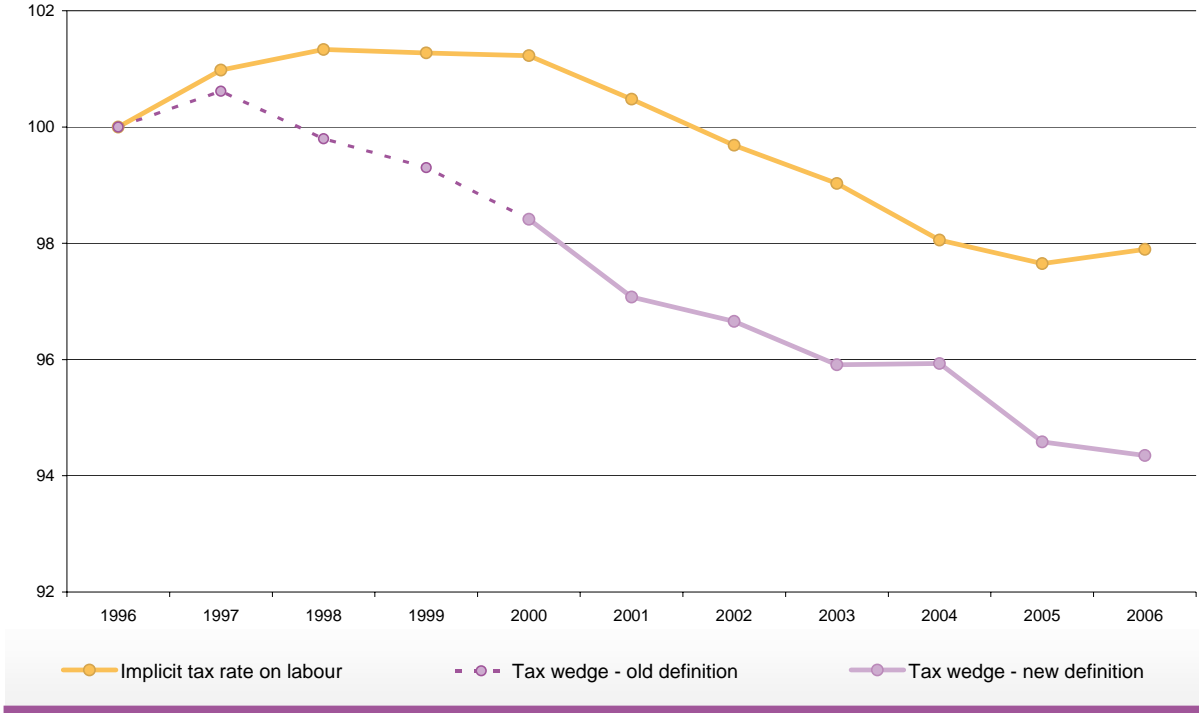
The ITRs on labour give a picture of the average tax burden on labour across all income classes. However, even at an unchanged overall tax level, the burden of taxation may be shifted between high- and low income taxpayers. Over the last decade policymakers have often resorted to cuts in labour taxes that are targeted to the bottom end of the wage scale in order to improve employability of low-skilled workers. To assess movement in this direction, it is relevant to compare the evolution of the ITR on labour with that of the tax wedge - i.e. the difference between labour costs to the employer and the corresponding net take-home pay of the employee.

The annual OECD publication *Taxing Wages*, provides internationally comparable data on total tax wedges for various household types and different representative wage levels. The tax wedges are calculated on the basis of tax legislation in force, by expressing the sum of personal income tax, employee's plus employer's social security contributions together with any payroll tax, as a percentage of total labour costs. These indicators can theoretically identify discretionary tax policy measures as regards personal income tax and social

contributions while at the same time excluding the effects of cyclical factors (which are not filtered out by the ITRs on labour). Hence, the two approaches are complementary.

Graph XII - ITR on labour vs. tax wedge: Trend

EU-25 averages, index 1996=100



Source: Commission Services, OECD, data from the Structural indicators database – (OECD model).

Note: The tax wedge refers to a single person without children at 2/3 of average earnings

Graph XII compares the developments during the period 1996-2006 of the ITR on labour and the tax wedge for a single person without children at 2/3 of average earnings.

Over the 1996-2006 period, the EU average tax burden on labour stabilized and then started to slowly decline. This trend is visible in the development of both indicators. However, the indicators do not always develop in parallel. Two periods can be distinguished: up to 2000 the ITR on labour increased and then remained stable, whereas the tax wedge started to decrease markedly already as of 1998. The gap between the two indicators opened up. In the second period, from 2001-2005, the two series run roughly parallel, both showing a downward trend. Despite changes in single years, the gap overall remained nearly unchanged over these years. In 2006, however, the downward trend in the tax wedge continues, whereas in the case of the ITR on labour, the average rate somewhat increased. All in all, this suggests that the relatively

limited efforts carried out in the EU to decrease the tax burden on labour have benefited more to the low wage earners.

4.2.1 ITR on capital

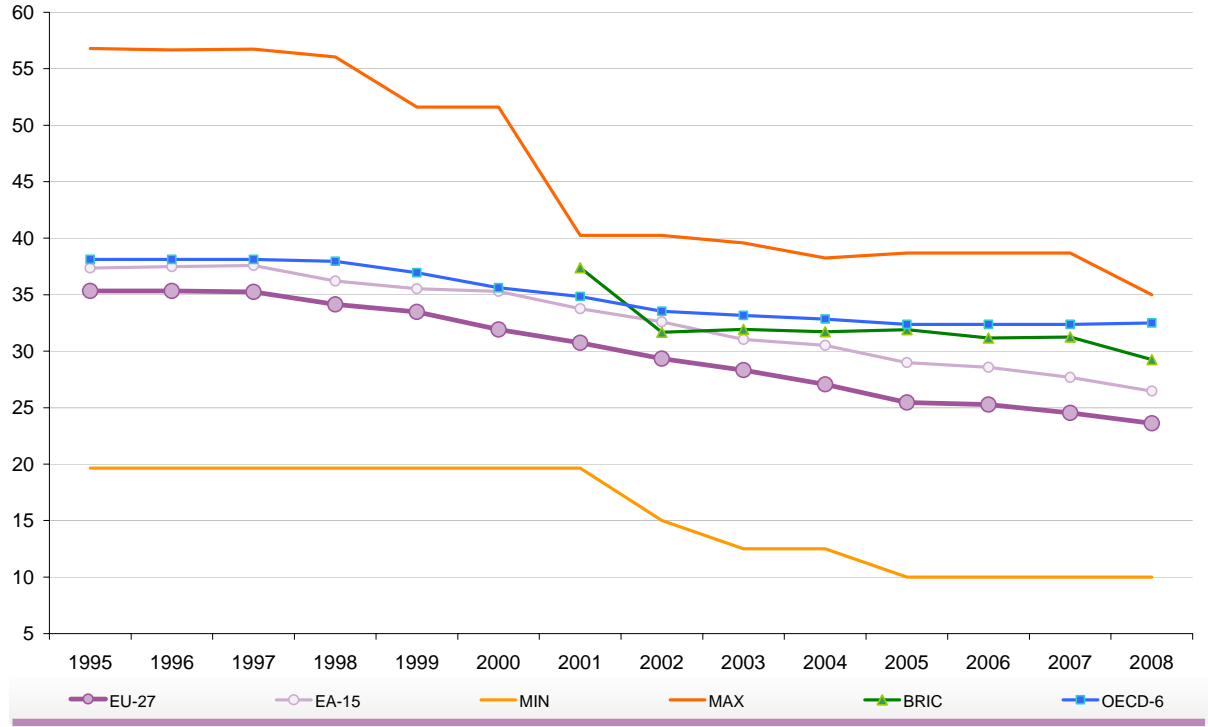
Although corporate income tax revenues only account for 9% (arithmetic average) of total tax revenues in the EU, the trends affecting this tax more likely to be subject to competition are of particular interest.

Graph XIII displays the developments of the adjusted statutory corporate income tax rates for the EU-27, the Euro area, a group of 6 non EU OECD member countries ('OECD-6', consisting of Australia, Canada, Switzerland, Japan, Norway, United States,) as well as a few important emerging countries.

The average statutory rate has decreased by 11,7 percentage points during the period 1995-2008. The reduction was almost as important in the Euro Area as in the EU-27 as a whole. The trend has continued during the most recent period, as a result in particular of a decrease in the rate from 38.7% to 29.8% in Germany and from 37.3% to 31.4% in Italy.

The decrease of corporate income statutory tax rates has been more pronounced in the EU than in other geographical areas. As an example, the average statutory CIT rate of the 'OECD-6' countries was in 1995 exceeding the future Euro Area average by 0.7 percentage points and the EU-27 average by 2.8 points. In 2008, the difference has grown to respectively 6 and 8.9 percentage points. The average CIT statutory rate of Brazil, Russia, India, and China is in 2008 above both the Euro area and EU-27 averages.

Graph XIII – Adjusted top statutory tax rates on corporate income



Source: Commission Services

Note: Only the basic (non-targeted) top rate is presented. Existing surcharges and averages of local taxes are included (see European Commission 2008a, page 88)

Despite this impressive reduction of statutory tax rates, revenues have reached a peak in the EU-27 in 2006, latest year for which data is available. CIT revenues represent 3.3% of GDP in the EU-27 and 3.5% in the Euro Area. The influence of the economic cycle appears however clearly behind the trends displayed in graph XIV.

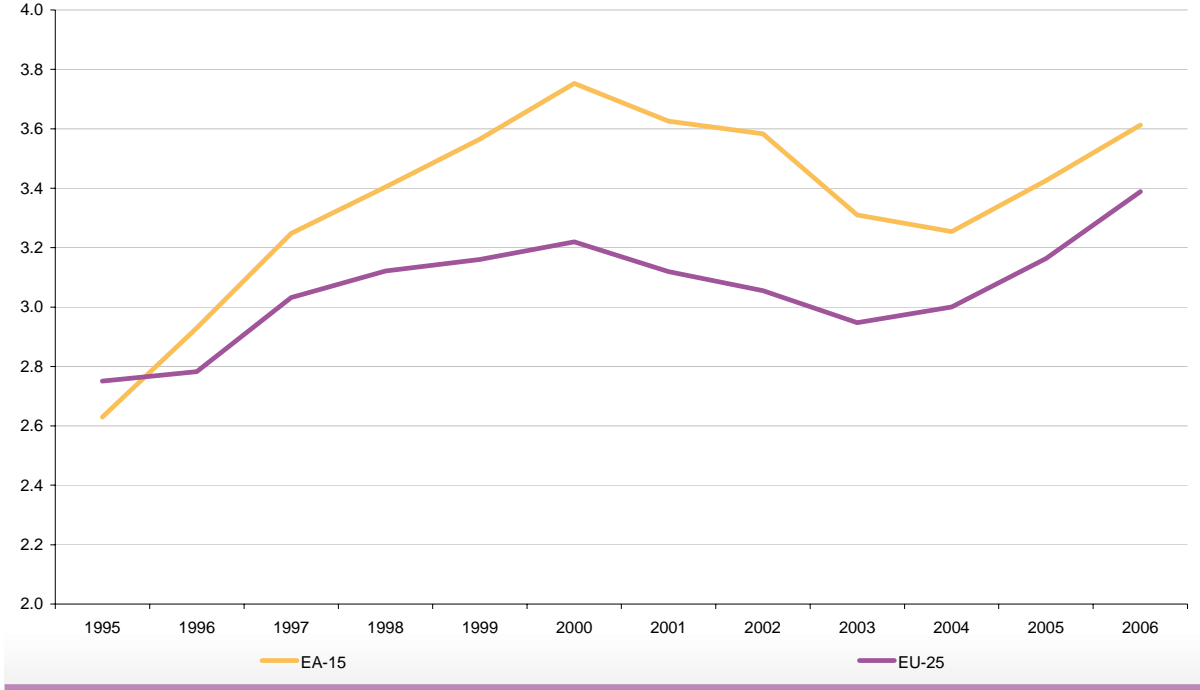
The ratio between corporate income tax revenues and GDP was higher in 2006 than in 1995 in all Member States except the Czech Republic, Estonia, Italy, Luxembourg, Poland and Slovakia. Member States applying low statutory rates do not always collect low revenues: Cyprus and Ireland which applied the lowest rates in 2006 registered higher than average revenues. CIT revenues in Cyprus reached 5.5% of GDP, the highest ratio in the EU-27.

Revenues collected by individual Member States can be affected by specific factors such as the importance of profit shifting carried out by multinational companies to take advantage of rates differentials. However, the diverging trends of rates and revenues at the level of the EU as a whole has become a paradox, subject of growing economic research.

Using Taxation Trends data, Piotrowska and Vanborren (2008) have shown that corporatization (defined as the increase of the ratio between corporate income and business income) has contributed to maintain the level of CIT revenues in a context of decreasing statutory rates partly offset by tax base broadening. De Mooij and Nicodème (2008) also demonstrate that the simultaneous decline in corporate tax rates and rising corporate tax-to-GDP ratios in Europe may to a large extent be explained by growing corporatization and income shifting from personal to corporate income tax.

Graph XIV – Corporate income tax revenues

arithmetic averages, % of GDP



Source: Commission Services

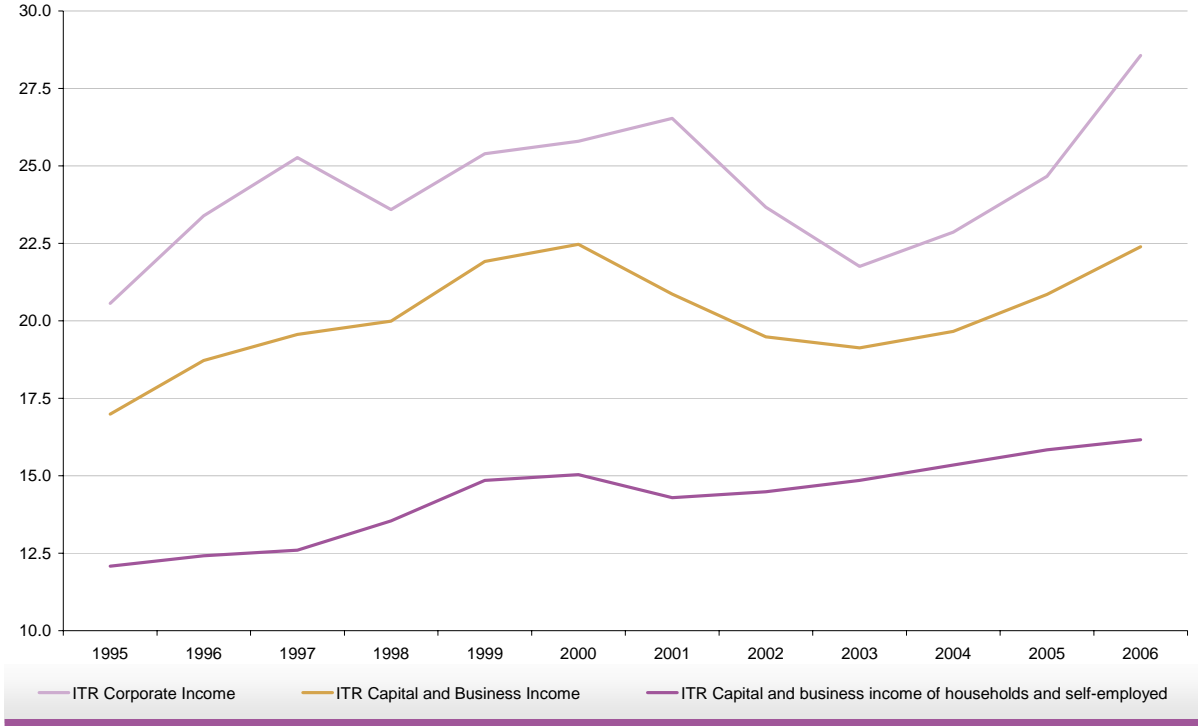
As illustrated in graph XV, the increase in tax burden on capital in the EU has affected both corporations and households. The ITR on capital and business income for the EU-25 rose from 17% in 1995 to 22.4% in 2006. The ITRs for corporations and for households have increased respectively from 20.6% to 28.6% and from 12.1% to 16.2%.

The ITRs on capital have however not increased in all Member States: the ITR on capital and business income has significantly decreased in Estonia and Slovakia, as a result of a strong

reduction of the tax burden on corporate income rather than on the capital and business income of households and self employed.

Graph XV – Implicit tax rates on capital and business income

1995-2006, EU-25, weighted averages, in %



Source: Commission Services

5. Conclusion and ideas for further research

Comparable statistics for international comparisons of the tax burden are very important for policy analysis. A lot has been done in recent years to overcome methodological difficulties in order to construct reliable measures for the overall tax burden and for the tax burden for the different economic functions. Due to the European System of National and Regional Accounts ESA95 and the additional methodology developed for the report 'Taxation trends in the European Union' the tools needed are now available.

Data available for the 1995-2006 period show that Member States have been by and large able to maintain the level of overall tax revenues despite an increasingly globalised environment. The enlargements of the European Union in 2004 and 2007 resulted in an increased diversity within the Union. A wide dispersion of more than 20 percentage points of GDP can be observed for the overall tax-to-GDP ratio within the European Union. This signals that

Member States still seem to have room for manoeuvre to implement different kinds of tax policies. This also refers to the structure by type of tax and the tax burden imposed on the different economic functions.

Given the big divergence observed for the EU Member States, it would be interesting to evaluate in how far a convergence or divergence of the overall tax burden and the main other indicators discussed can be observed in the European Union. Two convergence indicators are already included in European Commission (2008a), the 'Standard deviation/mean' indicator and the 'Max-Min' indicator. So far, however, they are only used to a limited extent in the publication. Given the importance, the topic seems to merit a more in depth analysis.

Another interesting question for future research would be to try to disentangle the different effects that influence the ITRs. Are changes in the level due to the changes in the tax legislation, fiscal drag or the business cycle? Such an analysis already exists for the overall tax burden¹⁵ and the main tax aggregates of part of the Member States. While interest for extending the approach to the ITRs has already been expressed, the complexity of the exercise should not be underestimated.

¹⁵ See Kremer et al. (2006) and Bouthevillain et al. (2001).

Annex

Scheme of ESA95 classification of taxes and social contributions

D.2	Taxes on Production and Imports
D.21	Taxes on Products
D.211	Value added type taxes
D.212	Taxes and duties on imports excluding VAT
D.2121	Import duties
D.2122	Taxes on imports, excluding VAT and import duties
D.2122a	Levies on imported agricultural products
D.2122b	Monetary compensatory amounts on imports
D.2122c	Excise duties
D.2122d	General sales taxes
D.2122e	Taxes on specific services
D.2122f	Profits of import monopolies
D.214	Taxes on products, except VAT and import taxes
D.214a	Excise duties and consumption taxes
D.214b	Stamp taxes
D.214c	Taxes on financial and capital transactions
D.214d	Car registration taxes
D.214e	Taxes on entertainment
D.214f	Taxes on lotteries, gambling and betting
D.214g	Taxes on insurance premiums
D.214h	Other taxes on specific services
D.214i	General sales or turnover taxes
D.214j	Profits of fiscal monopolies
D.214k	Export duties and monetary comp. amounts on exports
D.214l	Other taxes on products n.e.c.
D.29	Other taxes on production
D.29a	Taxes on land, buildings and other structures
D.29b	Taxes on the use of fixed assets
D.29c	Total wage bill and payroll taxes
D.29d	Taxes on international transactions
D.29e	Business and professional licences
D.29f	Taxes on pollution
D.29g	Under-compensation of VAT (flat rate system)
D.29h	Other taxes on production n.e.c.
D.5	Current taxes on income, wealth, etc.
D.51	Taxes on income
D.51a+D.51c1	Taxes on individual or household income incl. holding gains
D.51b+D.51c2	Taxes on the income or profits of corporations incl. holding gains
D.51c3	Other taxes on holding gains

D.51d	Taxes on winnings from lottery or gambling
D.51e	Other taxes on income n.e.c.
D.59	Other current taxes
D.59a	Current taxes on capital
D.59b	Poll taxes
D.59c	Expenditure taxes
D.59d	Payments by households for licences
D.59e	Taxes on international transactions
D.59f	Other current taxes n.e.c.
D.91	Capital taxes
D.91a	Taxes on capital transfers
D.91b	Capital levies
D.91c	Other capital taxes n.e.c.
D.611	Actual social contributions
D.6111	Employers' actual social contributions
D.61111	Compulsory employers' actual social contributions
D.61112*	Voluntary employers' actual social contributions*
D.6112	Employees' social contributions
D.61121	Compulsory employees' social contributions
D.61122*	Voluntary employees' social contributions*
D.6113	Social contributions by self- and non-employed persons
D.61131	Compulsory contributions self- and non-employed persons
D.61132*	Voluntary contributions by self and non-employed persons*
D.612*	Imputed social contributions*

* not included in the definition of total taxes used in the paper

Source: Commission Services

References

Bouthevillain, C., P. Cour-Thimann, G. van den Dool, P. Hernández de Cos, G. Langenus, M. Mohr, S. Momigliano and M. Tujula (2001), *Cyclically adjusted budget balances: an alternative approach*, ECB Working Paper, No. 77.

Bundesministerium der Finanzen (2008), *Monatsbericht des BMF*, Juli 2008, pp. 87-90

Elschner, C., L. Lammersen, M. Overesch and R. Schwager (2006), *The Effective Tax Burden of Companies and of Highly Skilled Manpower: Tax Policy Strategies in a Globalised Economy*, *Fiscal Studies* 27, 513 - 534.

De Mooij, R. A. and Nicodème, G., 2008, *Corporate tax policy and incorporation in the EU*"; *International Tax Public Finance*, 15, 478-498.

European Commission (1996) *Council Regulation (EC) No 2223/96 of 25 June 1996 on the European system of national and regional accounts in the Community – Official Journal L 310*, pp 1 – 469, November 1996.

European Commission (2000), *Structures of the taxation systems in the European Union: 1970-1997*, Luxembourg.

European Commission (2008a), *Taxation trends in the European Union: Data for the EU Member States and Norway*, Luxembourg.

European Commission (2008b), *Taxation trends in the European Union: Main results*, Luxembourg.

European Commission (2008c), *Taxation trends in the EU*, rapid press release 08/92, 26 June 2008.

Eurostat (1996), *European system of accounts, ESA 95*, Luxembourg.

Eurostat (2008), *Statistics in Focus, Economy and Finance*, 47/2008, 'Tax revenue in the EU', Luxembourg.

Kremer, J., C. Rodrigues Braz, T. Brosens, G. Langenus, S. Momigliano and M. Spolander (2006), *A disaggregated framework for the analysis of structural developments in public finances*, ECB Working Paper, No. 579.

OECD (2008a), *Revenue Statistics*, 2008 edition.

OECD (2008b), *Taxing Wages 2006-2007*, 2007 edition.

Piotrowska, J and W. Vanborren, (2008), *The corporate income tax rate-revenue paradox: Evidence in the EU*, Taxation papers, European Commission.