An approach to the structural features of the socio-economic activity of a country based on a Social Accounting Matrix.Evidences and multiplier effects on distribution of income.

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Abstract

A Social Accounting Matrix (SAM) is presented as a tool to study the socio-economic activity of a country. This activity involves the monetary or nominal flows that are measured by the National Accounts, as well as production (organized in factors, industries and goods and services) and institutions (organized in households, general government, non-financial and financial corporations, non-profit institutions serving households, and rest of the world).

In order to contribute to the definition of a methodology that can contribute to improving the knowledge of the different aspects of this activity, the potentialities of a SAM for its reading and interpreting are explored, as well as for carrying out experiments regarding its functioning.

Through a SAM-based approach, how to construct more or less complex networks of linkages of the above-mentioned flows is shown, from which structural features can be evidenced and the associated multiplier effects studied.

Following an application to Portugal, it is shown that a numerical version of a SAM, enables an empirical description of the origin, use, and distribution of income, whereas, an algebraic version of a SAM allows one to carry out, for example, a deeper study of the multiplier effects associated with the institutional distribution of income. The crucial role of the factors of production accounts is identified in this study, namely when they establish the link between the generation and the distribution and use of income. In this process, the important role the complementary details that the Input-Output Matrix (IOM) can add is also identified. Thus, being the generation of income the result of the output of goods and services and the associated costs, on the one hand, an industry-by-industry IOM can add details regarding domestic and imported intermediate consumption by and between industries and, on the other hand, a product-by-product IOM can add details regarding the domestic and imported intermediate consumption of goods and services.

Keywords: Social Accounting Matrix; National Accounts; SAM-based approach; socio-economic structure; Input-Output Matrix; Income Distribution.

JEL Classification: E01; E02; E16; E25; D57.

Abbreviations

ESA – European System of National and Regional Accounts in the European Community

CPC – Central Product Classification

DI – Disposable Income

GAV – Gross Added Value

GDP – Gross Domestic Product at market prices

GNI – Gross National Income

IEA – Integrated Economic Accounts

IO – Input-Output

IOM – Input-Output Matrix

ISIC – International Standard Industrial Classification of All Economic Activities

ISWGNA – Inter-Secretariat Working Group on National Accounts

NACE – *Nomenclature Statistique des Activités Économiques dans la Communauté Européenne* (Statistical Classification of Economic Activities in the European Community)

NB – Net Borrowing

NL – Net Lending

NPISH – Non-Profit Institutions Serving Households

S – Gross Savings

SAM – Social Accounting Matrix

SNA – System of National Accounts

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1. Introduction

The activity of a country that involves monetary or nominal flows is complex and its knowledge depends on the use of tools, or working instruments. In this paper this activity, which involves production and institutions, will be designated as "socio-economic activity", these flows will be all the measured by the National Accounts, and a Social Accounting Matrix (SAM) will be the working instrument, or tool. The research on the potentialities of this tool will be oriented in such a way as to show that it enables the reading and interpretation the multiple aspects of the reality under study, as well as carry out experiments with its functioning.

The option of working with the National Accounts has behind a research purpose of defining a methodology that could be adopted by as many users as possible, and which could contribute to improving the knowledge about different aspects of the so-called socio-economic activity of a country. This resulted from the perception that the National Accounts, on one hand, are aligned to a system that has progressively been adjusted, although with limitations and inaccuracies, with the aim of being improved, which conveys some confidence, mainly regarding alternative sources of information. On the other hand, the National Accounts have been produced in a more-or-less complete and adapted way, by almost every country in the world. Thus, since its disclosure is regular, (or at least partially) free, and credible, its adoption becomes accessible to a greater number of users and uses.

Therefore, the adoption of National Accounts as a base source of information of the SAM could contribute to produce better studies in different areas, as well as useful results for the process of policy evaluation and decision making.

This explains why the rules and the nomenclatures of the latest version of the SNA (ISWGNA, 2009) will underlie the methodology proposed for a work at a macroeconomic level of analysis. As done previously, I will present this methodology in this paper always from a progressively better-systematized perspective. This methodology is my own version, and is a result of research based on the studies of R. Stone, G. Pyatt, and J. Round[1], which started with Santos (1999).

A SAM-based approach will be adopted, according to which empirical and theoretical descriptions of the activity of a country are possible with, respectively, numerical and algebraic versions of the SAM. Each cell of a SAM will be a number if it is in a numerical version, and will be an equation or system of equations, if it is in and algebraic version, or SAM-based model.

[1] Among the works of those authors I would like to highlight the following: Pyatt (1991, 1991a, 1988); Pyatt and Round (1985); Stone (1986, 1981, 1973).

I recognize that the adoption of the SNA rules and nomenclatures implicitly implies the adoption of the SNA underlying theoretical model, however, I realized that this would be the best way to pursue the above-mentioned research purpose.

As will be seen in Chapter 2, the SAM is a square matrix, in which the sum of the rows is equal to the corresponding sum of the columns. These rows and columns represent, respectively, the inflows and outflows of accounts in which production and institutions are worked together at a level of detail that depends on the corresponding disaggregation, extension, and complements [namely, the Input-Output Matrix (IOM)]. Thus, more or less complex networks of linkages of flows with different intensities can be constructed for specific periods and geographical areas, as will be seen in Chapter 3. Structural features of the underlying activity of that network of linkages can be evidenced, and the associated multiplier effects can be studied, as will be seen in Chapters 4 and 5, respectively.

Chapters 2 and 3 will show that with the SAM, the value of production and the associated costs as well as the demand and supply of goods and services can be worked together with various types of income, namely, generated, disposable, and accumulated income. This work, which involves production and institutions and a matrix format when based in a numerical version of a SAM, enables an empirical description of the origin, use, and distribution of this income, as will be shown in Chapter 4. In Chapter 5, an algebraic version will be used to illustrate a possible deeper study of the institutional distribution of income, using some of the potentialities of the SAM.

A summary and some concluding remarks are presented in Chapter 6, which will systematize how a matrix form and a specific organisation of the National Accounts, materialized in a SAM, can evidence and provide conditions for research on the structural features of the socio-economic activity of a country.

2. A SAM base form

In a SAM, the monetary or nominal flows between production and institutions, occurring in a particular geographical space, in a given time period are represented and can be studied.

The SAM is a square matrix, in which the sum of the rows is equal to the corresponding sum of the columns. The entries in rows represent resources, incomes, receipts or changes in liabilities, and net worth. In the columns the entries are outlays, expenditures or changes in assets.

The way how the accounts (rows and columns) are organized and the corresponding details included depends on the purposes of the study for which it will be used and on the available information.

2.1. Schematic representation

Using a top-down methodology, I will first present a SAM base form, associated to a zero level of disaggregation, which is a summary of the flows measured by the National Accounts. Table 1 shows that form, with seven rows and columns (*1* to *7*), each of which represent the SAM accounts – described by the corresponding initials, and the cells represent the above mentioned monetary or nominal flows (also mentioned as transactions) "T". The location of "T" is described by two initials between brackets, the first of which represents the row account, whilst the second represents the column account. Table 2 identifies and describes these accounts and the corresponding totals, and Table 3 identifies and describes these flows and the corresponding codes in the latest version of the SNA (ISWGNA, 2009).

Table 1. A SAM base form (level of disaggregation 0)

		f	a	p	dic	dik	dif	rw	*total*
		1	*2*	*3*	*4*	*5*	*6*	*7*	
f	*1*		T(f,a)					T(f,rw)	*f.*
a	*2*			T(a,p)					*a.*
p	*3*		T(p,a)	T(p,p)	T(p,dic)	T(p,dik)		T(p,rw)	*p.*
dic	*4*	T(dic,f)	T(dic,a)	T(dic,p)	T(dic,dic)			T(dic,rw)	*dic.*
dik	*5*				T(dik,dic)	T(dik,dik)		T(dik,rw)	*dik.*
dif	*6*					T(dif,dik)	T(dif,dif)	T(dif,rw)	*dif.*
rw	*7*	T(rw,f)	T(rw,a)	T(rw,p)	T(rw,dic)	T(rw,dik)	T(rw,dif)		*rw.*
total		*.f*	*.a*	*.p*	*.dic*	*.dik*	*.dif*	*.rw*	

Source: Own construction, based on Santos (2015 and 2015a).

Table 2. A SAM base form (level of disaggregation 0) – accounts and totals description

Accounts (row and column)			total		SNA accounts (correspondence)
			row	column	
Production	f – factors of production	*1*	*f.* - aggregate income, received as compensation of the factors of production	*.f* - aggregate income, paid as compensation of the factors of production	primary distribution of income
	a – activities (industries)	*2*	*a.* - production value	*.a* - total costs	production
	p – products (goods and services)	*3*	*p.* - aggregate demand	*.p* - aggregate supply	goods and services
(domestic) institutional sectors	dic - current	*4*	*dic.* - aggregate income, received by domestic institutions	*.dic* - aggregate income, paid by domestic institutions	secondary distribution of income, redistribution of income in kind and use of income
	dik - capital	*5*	*dik.* - investment funds	*.dik* - aggregate investment	capital

Accounts (row and column)			total		SNA accounts (correspondence)
			row	column	
	dif - financial	*6*	*dif.* - total financial transactions (received)	*.dif* - total financial transactions (paid)	financial
rw – rest of the world		*7*	*rw.* - value of transactions to the rest of the world	*.rw* - value of transactions from the rest of the world	rest of the world

Source: Own construction, based on Santos (2015 and 2015a).

Table 3. A SAM base form (level of disaggregation 0) – nominal transactions description

Flows	Description	SNA Code
T(f,a) T(f,rw) T(dic,f) T(rw,f)	compensation of factors of production[2] consist of the income of the institutional sectors originating from the compensation of employees and the compensation of employers and own-account (or self-employed) workers, as well as the compensation of capital, including property income	D1 D4 B2g B3g
T(a,p)	production (basic prices) represents the output of goods and services	P1
T(p,a)	intermediate consumption (purchasers' prices) consists of the value of the goods and services consumed as inputs of the process of production, excluding those fixed assets whose consumption is recorded as consumption of fixed capital	P2
T(p,p)	trade and transport margins amounts to zero and, when it is disaggregated and takes the form of a submatrix, it allocates the output of the trade and transport services used in the domestic trade to the supplied products	
T(p,dic)	final consumption (purchasers' prices) consists of the expenditure incurred by resident institutional units on goods or services which are used for the direct satisfaction of individual needs or wants, or the collective needs of members of the community	P3
T(p,dik)	gross capital formation (purchasers' prices) includes gross fixed capital formation (GFCF), changes in inventories, and acquisitions less disposals of valuables (ADV)	P5
T(p,rw)	exports (purchasers' prices) includes the transactions in goods and services from residents to non-residents	P6
(part of) T(rw,p)	imports (purchasers' prices) includes the transactions in goods and services from non-residents to residents	P7
T(dic,p) (part of) T(rw,p)	net taxes on products represent the taxes on products minus the subsidies on products	D21-D31
T(dic,a) T(rw,a)	net taxes on production represent the (other) taxes on production minus the (other) subsidies to production	D29-D39
T(dic,dic) T(dic,rw) T(rw,dic)	current transfers[3] include: current taxes on income, wealth, etc.; net social contributions; social benefits other than social transfers in kind; other current transfers, and; the adjustment made for the change in pension entitlements	D5 D61 D62 D7 D8

[2] Also referred to as gross added value in T(f,a).

[3] The adjustment made for the change in pension entitlements (D8), included in T(dic,dic), is not a current transfer but, due to its insignificance (0.3% of the total current transfers within domestic institutions in 2013), I did not change the designation of this part of the SAM.

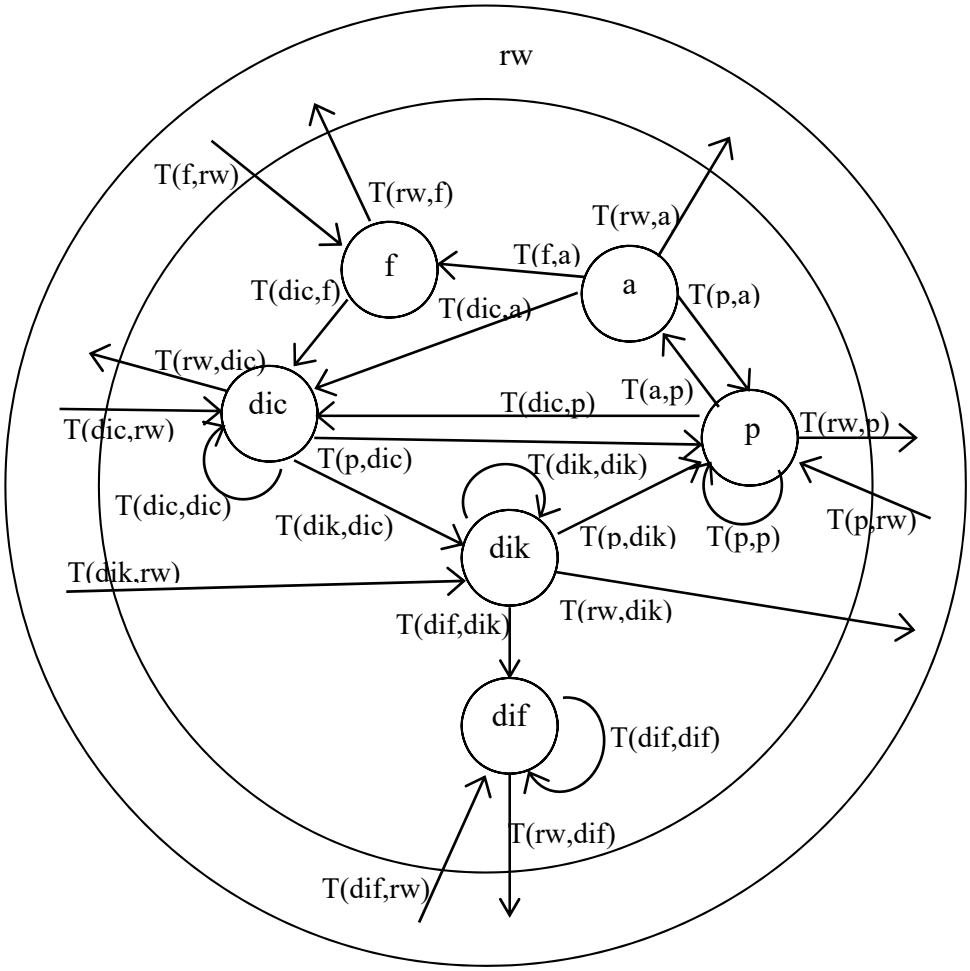
Flows	Description	SNA Code
T(dik,dik)	capital transfers include: capital taxes; investment grants; and other capital transfers	D91
T(dik,rw)		D92
T(rw,dik)		D99
T(dik,dic)	gross saving measures the portion of aggregate income that is not used for final consumption expenditure and current transfers to domestic institutions or to the rest of the world	B8g
T(dif,dik)	net lending(+) /borrowing(-) the net lending or borrowing of the total economy is the sum of the net lending or borrowing of the institutional sectors	B9
T(dif,dif)	financial transactions includes: monetary gold and special drawing rights; currency and deposits; debt securities; loans; equity and investment fund shares or units; insurance, pension and standardised guarantee schemes; financial derivatives and employee stock options; and other accounts receivable/payable	F1 to F8
T(dif,rw)		
T(rw,dif)		

Source: Own construction, based on Santos (2015 and 2015a).

Note: A description on the levels of valuation of the flows associated to the production accounts and to the macroeconomic aggregates can be found in the Appendix of Santos (2012).

Outline 1 schematically represents the above-described flows, in which the smaller circle represents the (domestic) economy and the bigger one the world. With the direction of the arrows representing the direction of the flows that are being studied, within the smaller circle are all the flows within the domestic economy - with the flows between this and the rest of the world being represented by the arrows that cut over its boundaries. This representation helps us to understand how important the study of the direct and induced effects of any change in any nominal flow is in the whole economy, for which the SAM-based modelling is an alternative. That importance is reinforced if we consider that, on one hand, the intensity of those flows is determined by their values, as shown in Table 4 for Portugal in 2013, and, on the other hand, the network of linkages can be extended or specified if disaggregations were made, as will be seen in Chapter 3.

Outline 1. A SAM base form (level of disaggregation 0) – schematic representation of the nominal flows between the accounts, presented and described in Tables 1 and 3.



Source: Own construction, based on Santos (2012a)

2.2. Application

In the SNA the Integrated Economic Accounts (IEA) Table is a summary of all the detail observed by that System, including the full sequence of accounts for (domestic) institutional sectors, the rest of the world and the total economy. Based on this table, and taking into consideration the previous descriptions, it was possible to construct an illustrative SAM base form that is presented in Table 4, which represents the level of disaggregation 0 of the activity of Portugal as observed in the National Accounts of 2013 (at current prices).

Table 4. A SAM of Portugal in 2013 - level of disaggregation 0

(unit: millions of euros)

		f	a	p	dic	dik	dif	rw	*total*
		1	*2*	*3*	*4*	*5*	*6*	*7*	
f	*1*		149,733					6,739	*156,472*
a	*2*			307,861					*307,861*
p	*3*		158,093	0	143,644	24,914		67,284	*393,935*
dic	*4*	145,686	1,682	20,607	88,074			7,110	*263,158*
dik	*5*				26,164	2,131		2,852	*31,148*
dif	*6*					3,946	- 7,804	- 10,400	*- 14,259*
rw	*7*	10,786	- 1,647	65,467[a)]	5,276	157	- 6,455		*73,584*
total		*156,472*	*307,861*	*393,935*	*263,158*	*31,148*	*- 14,259*	*73,584*	

Sources: Table A.1 (in Appendix).

a) 65,573 (imports) less 106 (net taxes on products sent to the institutions of the European Union)

Considering the description given in Tables 2 and 3 about Table 1, and based on the reading of the rows and columns of Table 4 we can take a first snapshot of the activity of Portugal in 2013, as described below.

At the level of production accounts, through the factors of production account – row and column f (number *1*), show the aggregate or primary income generated in 2013, also designated as compensation of the factors of production, namely of labour and capital, which was in the sum of 156,472 million Euros. Reading in row, the amount was composed of 149,733 (95.7%) and 6,739 (4.3%) million Euros, received from domestic activities[4] and from the rest of the world[5], respectively. Reading in column, this is composed of 145,686 (93.1%) and 10,786 (6.9%) million Euros, paid to domestic institutions[6] and to the rest of the world, respectively.

In turn, continuing at the level of the production accounts, in the activities account – row and column a (number *2*) show, respectively, the production value and the total costs associated with the process of production, which totalled 307,861 million Euros for the Portuguese economy in 2013. In row, that amount represents the output of goods and services. In column, it is composed of 149,733 (48.3%) million Euros of compensation of factors of production, 158,093 (51.4%) million Euros of intermediate consumption, 1,682 (0.5%) million euros of net taxes on production received by the

[4] Received by residents and non-residents working in the Portuguese economic territory. This amount is the gross added value and does not include taxes and subsidies on production and imports.

[5] Received by residents working in the rest of the world.

[6] Paid to residents in the Portuguese economic territory. This amount is the gross national income and does not include taxes and subsidies on production and imports.

Portuguese Government and – 1,647 (-0.5%) million Euros of net taxes on production received by the institutions of the European Union[7].

Finally, still at the level of the production accounts, through the products account – row and column p (number *3*) show the main components of the aggregate demand and supply of the goods and services in the Portuguese economy in 2013, which amounted to 393,935 million Euros. Thus, by reading row p, the aggregate demand was composed of 158,093 (40.1%) million Euros of intermediate consumption, 143,644 (36.5%) million Euros of final consumption, 24,914 (6.3%) million Euros of gross capital formation, and 67,284 (17.1%) million Euros of exports. Reading column p, the aggregate supply was composed of 307,861 (78.2%) million Euros of the output of goods and services, 20,607 (5.2%) million Euros of net taxes on products received by the Portuguese Government, - 106 million Euros of net taxes on received by the institutions of the European Union[7], and 65,573 (16.6%) million Euros of imports – the last two added in the same cell (T(rw,p)). The trade and transport margins are also a component in account p, which amounts to zero at this level of disaggregation, as mentioned in Table3.

At the level of the domestic institutions accounts, in the current account – row and column dic (number *4*) the aggregate income of the Portuguese institutions in 2013 is shown, which amounted to 263,158 million Euros. In row we have the origin of that income, represented as follows: 145,686 (55.4%) million Euros, received as compensation of the factors of production by domestic institutions; 1,682 (0.6%) and 20,607(7.8%) million Euros of net taxes on production and net taxes on products, respectively - both received by the Portuguese government; 88,074 (33.5%) and 7,110 (2.7%) million Euros of current transfers within domestic institutions and from the rest of the world, respectively. In column we have the destination or use of the same income, with the following composition: 143,644 (54.6%) million Euros, in final consumption; 88,074 (33.5%) and 5,276 (2.0%) million Euros in current transfers within domestic institutions and to the rest of the world; 26,164 (9.9%) million Euros in gross savings.

In the capital account - row and column dik (number *5*), apart from showing the net lending (or borrowing) of the Portuguese institutions in 2013, information is also shown regarding acquisitions, less disposals of non-financial assets (or the various types of investment in non-financial assets) and capital transfers, which amounted to 31,148 million Euros. Reading in row, this amount represents investment funds, and was composed of: 26,164 (84%) million Euros of gross savings; 2,131 (6.8%)

[7] Due to the conventions underlying the SAM structure, this negative (net) amount represents a receipt and not an expenditure, that is, the amount received by activities as subsidies on production was greater than the amount expended in taxes on production.

and 2,852 (9.2%) million Euros of capital transfers within domestic institutions and from the rest of the world. Reading in column, the amount represents aggregate investment and was composed of: 24,914 (80%) million Euros of gross capital formation; 2,131 (6.8%) and 157 (0.5%) million Euros of capital transfers within domestic institutions and to the rest of the world, respectively, and 3,946 (12.7%) million Euros of net lending.

The financial account - row and column dif (number *6*), represents the net flows associated with the acquisition of financial assets and the incurrence of liabilities, underlying which there is the above-mentioned net lending. These flows amounted to – 14 259 million Euros. Reading in row, this amount is composed of 3,946 million Euros of net lending, - 7,804 million Euros of net financial transactions between domestic institutions, and – 10,400 million Euros of net financial transactions from the rest of the world. Reading in column, besides the net financial transactions between domestic institutions (- 7,804 million Euros), this amount also includes – 6,455 million Euros of net financial transactions to the rest of the world.

The rest of the world account - row and column rw (number *7*) show all the transactions between resident and non-resident actors in the accounts described above (production and domestic institutions), or between the Portuguese economy and the rest of the world in 2013, which amounted to 73,584 million Euros. Thus, the row represents the flows from residents to non-residents, or the value of transactions to the rest of the world, with the following composition: 10,786 (14.7%) million Euros of compensation of factors of production, – 1,647 (-2.2%) million Euros of net taxes on production (received by European Union institutions)[7] 65,467 (89%) million Euros of imports (65,573 million Euros), to which is added net taxes on products (- 106 million Euros, received by the institutions of the European Union[7]), 5,276 (7.2%) million Euros of current transfers, 157 (0.2%) million Euros of capital transfers, and - 6,455 (-8.8%) million Euros of net financial transactions. In turn, the column shows the decomposition of the value of transactions from the rest of the world, or the flows from non-residents to residents, as follows: 6,739 (9.2%) million Euros of compensation of factors of production, 67,284 (91.4%) million Euros of exports, 7,110 (9.7%) million Euros of current transactions, 2,852 (3.9%) million Euros of capital transfers, and – 10,400 (-14.1%) million Euros of net financial transactions.

2.3. Macroeconomic aggregates and types of income

As practically all the flows observed and measured by the National Accounts are included in the above-presented SAM, it is possible to calculate and/or extract from it the main macroeconomic aggregates that are usually considered.

The following description is based on the four tables presented above.

Gross Domestic Product (GDP) can be calculated using the three known approaches: the production approach - in which intermediate consumption [T(p,a)] is subtracted from the output of goods and services [T(a,p)], adding the net taxes on products [T(dic,p) + (part of) T(rw,p)]; the expenditure approach - in which final consumption [T(p,dic)], gross capital formation [T(p,dik)], and net exports [T(p,rw) – (part of) T(rw,p)] are added; and the income approach - in which net taxes on production and imports [T(dic,p) + (part of) T(rw,p) + T(dic,a) + T(rw,a)] are added to the gross added value [T(f,a)]. The Portuguese GDP in 2013 was 170,269 million Euros.
GDP is the income generated in the domestic economy by residents and non-residents, added to the total net taxes on production and imports, to be valued at market prices.

Gross Domestic Product can be converted into Gross National Product or Income (GNI), by adding the compensation of factors of production (labour and capital) received from the rest of the world [T(f,rw)], and by deducting the compensation of factors of production (labour and capital) and net taxes on production and imports sent to the rest of the world [T(rw,f) – T(rw,a) – (part of) T(rw,p)], when these exist. Gross National Income can also be calculated directly from the SAM by adding the compensation of factors received by domestic institutions to the net taxes on production and on products received by domestic institutions [T(dic,f) + T(dic,a) + T(dic,p)]. The corresponding amount for Portugal in 2013 was 167,975 million Euros.
GNI is the income generated in the domestic economy and in the rest of the world by residents, added to the part received by the general government of net taxes on production and imports, to be valued at market prices.

Disposable Income (DI) can be calculated by adding the net current transfers received by domestic institutions [(received, or row sum) T(dic,dic) + T(dic,rw) – (paid, or column sum) T(dic,dic)+ T(rw,dic)] to Gross National Income. In our application for Portugal, this was 169,808 million Euros.

The following macroeconomic aggregates are usually presented with the above: Gross Saving (S) and Net Lending (NL), or Net Borrowing (NB), which are items that are provided directly by the SAM, through T(dik,dic) and T(dif,dik), respectively, which, in the case of Portugal in 2013, were 26,164 and 5,276 million Euros, respectively. As explained in Table 3, the latter amount represents NL, if it represented NB it would then be positioned in the T(dik,dif) cell. As confirmed by its position in the SAM structure, these figures integrate the funds of investment, either in non-financial and in financial assets, which I call ‘accumulated income’.

Without considering NL and NB, the above-mentioned gross aggregates can be converted into net aggregates (and S), by deducting the consumption of fixed capital. This lies outside the SAM base form, but is part of the Integrated Economic Accounts Table, in which the above presented macroeconomic aggregates are balancing items (codes B) - Table A.1 (in Appendix) is illustrative of the case of Portugal in 2013.

3. SAM accounts - disaggregation, extension and complements

From the presented base form, or level of disaggregation 0, depending on the aim of the study in which the SAM is being adopted and the available information, other SAMs can be constructed, with other levels of disaggregation in the production, institutions and rest of the world accounts, either within the scope of the SNA conventions, or not. Thus, each cell of the SAM base form (see Table 1 and 4, for the application to Portugal) will be converted into a sub-matrix, with the number of rows and columns corresponding to the level of disaggregation of the row and column accounts. The following description will continue adopting the latest version of the SNA nomenclatures and the type of the flows after the disaggregation will continue to be the same, although with the due specifications. The consistency of the whole system will therefore be preserved.

A first level of disaggregation (level of disaggregation 1) will be presented below. No other levels of disaggregation will be made in this paper, and that will be adopted as the specification of what can be made from the base form presented in the previous chapter.

I am aware that I am only making an introductory approach to the study of the structures of production and income distribution and that higher levels of disaggregation are required for more complete studies. However, as I stated in the introduction, the purpose of this work is methodological and as such a coherent and thorough treatment of this first level will facilitate the move to higher levels.

Before continuing, I would also like to mention the possibilities that Quarterly and Regional National Accounts give in terms of disaggregation in time and in space[8]. In turn, the Satellite Accounts (and other extensions), as presented in Chapter 29 of SNA (2008) can provide supplementary information in specific areas (such as: labour, health, unpaid household activity, household production) in a way that is consistent with the central framework, which can be useful to extend and/or complement the SAM.

[8] An example for a Portuguese region – Azores, can be seen in Santos (2011a).

3.1. Production accounts and the IOMs

As shown by Table 2, in the base form, the SAM production accounts are divided into factors of production, activities (industries) and products. These accounts correspond, respectively to the following SNA accounts: primary distribution of income, production, and goods and services. The nominal flows associated to those accounts can be identified in Table 1, which are described in Table 3.

Providing details about the process of production, within the SAM production accounts, one can see how the income resulting from the process of production and the ownership of assets is distributed within institutions and activities and how the available products (or goods and services) are used. These accounts also provide details about the process of production, regarding which the Input-Output Matrix (IOM) can add some more information on intermediate consumption of activities and products.

Considering the available information and the SNA nomenclatures, in this paper the disaggregation of the factors of production account was made in "labour" and "others". The former (labour) includes the compensation of employees. The later (others) includes the compensation of employers and own-account (or self-employed) workers and also the compensation of capital, namely property income. Such information can be derived from the IEA Table if the products and activities accounts are not disaggregated and from the Use Table, if the same accounts are disaggregated.

At the level of the SNA, the International Standard Industrial Classification of All Economic Activities (ISIC) Revision 4 (released on August 2008) is used to classify activities, which are organised into 21 sections, with the possibility of going as far as the fourth level of disaggregation. Identical organization is adopted by ESA, the Statistical Classification of Economic Activities in the European Community (NACE) Revision 2 (released on January 2008). The Supply and Use Tables provide this information, usually at a third level of disaggregation.

Regarding products, the SNA uses the Central Product Classification (CPC) Version 2.1 (released on August 2015), which are organised into 10 sections, with the possibility of going as far as the fifth level of disaggregation within each of these. The ESA uses the Statistical Classification of Products by Activity (CPA) Version 2.1 (released on November 2012), which are organised in the same way as activities, as the name implies.

For the application to Portugal in 2013, in a first level of disaggregation, besides the two sub accounts above mentioned, in the factors of production account (labour and others), ten activities (or industries) and ten products (or goods and services) were disaggregated into the activities and products accounts, respectively, which description is shown by Table 5. Such disaggregations were made from the

Supply and Use Tables (see appendices A.2 and A.3), as presented in the SAM of Table 7. In turn, in the Tables 8 and 9 we can see IOMs specifying the intermediate consumption of activities and products, respectively.

Is the first time I include IOMs in my work with SAMs. For now, these matrices will only be used to increase the detail of the production structural features. Especially for the case of the "industry-by-industry" IOM, this should be understood as a first step for further research in order to explore the following Graham Pyatt's statement:

> "… SAMs and extended IO tables are not equivalent and one key difference can be explained by analogy. The essence of IO is not that production activity is disaggregated into different industries, but that these industries are related, one to other, through transactions between them, i.e. through the buying and selling of raw materials, and that the structure of production is conditioned by these linkages. By the same token, the essence of a SAM, in this context, is not the disaggregation of institutions into different household types plus various categories of companies, government and the rest of the world, all of which is on offer through an extended IO approach. Rather, the essential detail is to be found in the matrix of transactions and transfers between different types of institutions. These details include the unrequited transfers which characterize the social security system and direct taxation, all types of private remittance and all property income flows. The pattern of these transfers conditions the distribution of income in exactly the same way as the pattern of inter industry transactions conditions the structure of production" (Pyatt, 1999)

Table 5. Products (or goods and services) and activities (or industries) description for the level of disaggregation 1

SAM Accounts		National Accounts	
Products of activity… (p)	Activities (a)	Description	NACE Rev.2 Division
p01	a01	Agriculture, forestry and fishing	01-03
p02	a02	Industry, energy, water supply and sewerage	05-39
p03	a03	Construction	41-43
p04	a04	Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	45-56
p05	a05	Information and communication	58-63
p06	a06	Financial and insurance activities	64-66
p07	a07	Real estate activities	68
p08	a08	Professional, scientific and technical activities; administrative and support service activities	69-82

SAM Accounts		National Accounts	
Products of activity… (p)	Activities (a)	Description	NACE Rev.2 Division
p09	a09	Public administration and defence; compulsory social security; education; human health and social work activities	84-88
p10	a10	Arts; entertainment; repair of household goods and other services	90-99

Source: Own construction

3.2. Domestic institutions and rest of the world accounts

The proposed SAM base form, presented in Table 1, disaggregates the domestic institutions accounts into current, capital and financial accounts. As is systematized by Table 2, the capital and financial accounts have a direct correspondence between SAM and SNA, whereas the SAM current account corresponds to the following SNA accounts: secondary distribution of income, redistribution of income in kind and use of income. Once again, the flows associated to those accounts can be identified in Table 1, which are described in Table 3.

Depending on the adopted level of disaggregation, through the current account we can see how national income is transformed into disposable income through the receipt and payment of current transfers, and how the latter is distributed between final consumption and saving. On the other hand, through the capital account we can see the flows linked to acquisitions less disposals of non-financial assets (or the various types of investment in non-financial assets), the capital transfers involving the redistribution of income and the net lending or borrowing of domestic institutions, whereas in the financial account we can see the net flows that involve financial assets and liabilities that take place between domestic institutions, and between these and the rest of the world.

Either in the SAM and in the SNA through the rest of the world account we can see all the linkages between the domestic economy and the rest of the world, i.e. all the nominal flows between resident and non-resident units.

Chapter 4 of the 2008 SNA specifies the institutional sectors, including the rest of the world, as well as their possible disaggregation, which in some cases can be taken as far as the third level, although normally it cannot be taken beyond the first level. In the case of the rest of the world, such disaggregation will certainly depend on the country, or group of countries, that adopt and adapt this system.

For the application to Portugal in 2013, in a first level of disaggregation, five institutional sectors were identified, as described in Table 6.

Table 6. Domestic institutions description for the level of disaggregation 1

SAM Accounts (domestic) institutions (di) Current (c)	Capital (k)	Description	SNA (and ESA) Codes
h		Households	S14
nfc		Non-financial corporations	S11
fc		Financial corporations	S12
g		General government	S13
npi		Non-profit institutions serving households	S15

Source: Own construction

At the first level of disaggregation, the accounts of both institutions and the rest of the world are part of the Integrated Economic Accounts Table. Higher levels of disaggregation, whenever these are possible, are usually published in the separate accounts of institutions. Even at the first level of disaggregation, any research carried out of the institutional sectors with flows involving more than one row or column of the SAM, also requires the so-called "from whom to whom matrices". These matrices make it possible to fill in the cells of the sub-matrices of transactions taking place both within domestic institutions, and also between domestic institutions and the rest of the world, which are recorded in the above-described current, capital, and financial accounts[9].

Table 7 presents the level of disaggregation classified as the first, which was the possible in the institutions' current and capital accounts, derived from the Integrated Economic Accounts Table (see appendix A.1) and the "from whom to whom matrices" for the application to Portugal in 2013.

Just as the matrix form of the production accounts may be easily worked on from the supply and use tables, it would also be possible to work on the matrix form of the institutional accounts if some kind of "from whom to whom tables" were made official. This would be a crucial factor for implementing the SAM-based approach, in which SAMs with production and institutional accounts, capturing the network of linkages associated to the measured flows of income, would form the basis for macroeconomic models which would be capable of reproducing the multiplier processes that are implicit in the socio-economic activity of countries.

[9] For the application to Portugal in 2013 here presented, Statistics Portugal (*INE*), who works and discloses the non-financial National Accounts, provided (particularly) the "from whom to whom matrices" for the flows covered by the current an capital accounts to which those matrices were needed. However, that was not possible for the flows covered by the financial account, worked and disclosed by the Portuguese Central Bank (*Banco de Portugal*). That is why the financial SAM account is not disaggregated, like the current and capital accounts are.
The above mentioned "from whom to whom matrices" are not shown in this paper because they are considered confidential by Statistics Portugal (*INE*).

Table 7. A SAM of Portugal in 2013 - level of disaggregation 1

(unit: millions of euros)

			f			a											p					
			1	o	*total*	a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	*total*	p01	p02	p03	p04	p05	p06
			1	*2*		*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*		*13*	*14*	*15*	*16*	*17*	*18*
f	l	*1*	0	0	0	924	12 252	4 161	17 398	2 603	4 102	418	6 727	24 702	2 993	76 280	0	0	0	0	0	0
	o	*2*	0	0	0	3 338	12 848	2 520	18 900	2 538	3 813	17 353	3 304	7 167	1 672	73 454	0	0	0	0	0	0
	total		0	0	0	*4 262*	*25 100*	*6 681*	*36 298*	*5 141*	*7 915*	*17 771*	*10 031*	*31 869*	*4 665*	*149 733*	0	0	0	0	0	0
a	a01	*3*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7 556	298	17	123	0	0
	a02	*4*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	95 574	393	1 546	9	0
	a03	*5*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148	17 816	76	0	0
	a04	*6*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1 914	240	59 868	528	40
	a05	*7*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100	44	218	10 904	0
	a06	*8*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98	14 355
	a07	*9*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	355	7	0	0
	a08	*10*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	21	227	99	0
	a09	*11*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	64	178	476	142	0
	a10	*12*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	65	1	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	*7 586*	*98 115*	*19 083*	*62 604*	*11 782*	*14 395*
p	p01	*13*	0	0	0	1 094	6 144	1	432	3	0	1	41	93	29	*7 838*	3 128	0	0	- 3 128	0	0
	p02	*14*	0	0	0	2 655	57 648	4 811	11 183	1 150	197	423	1 126	4 933	677	*84 804*	0	24 774	0	- 24 774	0	0
	p03	*15*	0	0	0	108	538	4 878	743	114	72	339	98	698	71	*7 660*	0	0	0	0	0	0
	p04	*16*	0	0	0	200	2 716	200	6 920	214	202	36	575	1 701	224	*12 988*	0	0	0	0	0	0
	p05	*17*	0	0	0	52	624	88	914	2 431	664	43	1 188	744	177	*6 925*	0	0	0	- 459	459	0
	p06	*18*	0	0	0	142	1 427	691	1 896	137	4 080	- 169	1 026	506	115	*9 850*	0	0	0	0	0	0
	p07	*19*	0	0	0	6	458	105	1 180	171	367	184	169	401	80	*3 120*	0	0	0	0	0	0
	p08	*20*	0	0	0	215	3 958	713	5 669	1 989	1 353	327	4 336	2 665	784	*22 009*	0	0	0	0	0	0
	p09	*21*	0	0	0	11	83	22	109	129	55	7	87	1 049	28	*1 579*	0	0	0	0	0	0
	p10	*22*	0	0	0	26	117	24	171	130	94	10	80	197	470	*1 320*	0	0	0	- 1	0	0
	total		*0*	*0*	*0*	*4 510*	*73 714*	*11 533*	*29 216*	*6 467*	*7 085*	*1 200*	*8 726*	*12 987*	*2 654*	*158 093*	*3 128*	*24 774*	*0*	*- 28 362*	*459*	*0*
clc	h	*23*	76 246	41 299	*117 544*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	nfc	*24*	0	22 486	*22 486*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	fc	*25*	0	5 667	*5 667*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	g	*26*	0	- 784	*- 784*	- 34 651	14 401	3 385	19 985	3 665	16 369	38 596	4 256	- 46 190	- 18 134	*1 682*	95	13 059	492	1 932	1 018	1 068
	npi	*27*	0	773	*773*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	total		*76 246*	*69 440*	*145 686*	*- 34 651*	*14 401*	*3 385*	*19 985*	*3 665*	*16 369*	*38 596*	*4 256*	*- 46 190*	*- 18 134*	*1 682*	*95*	*13 059*	*492*	*1 932*	*1 018*	*1 068*
clk	h	*28*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	nfc	*29*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	fc	*30*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	g	*31*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	npi	*32*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
dif		*33*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
rw		*34*	371	10 415	*10 786*	33 931	- 14 101	- 3 315	- 19 570	- 3 588	- 16 029	- 37 794	- 4 168	45 230	17 758	*- 1 647*	3 285	53 756	117	4 213	1 319	685
Total			*76 617*	*79 856*	*156 472*	*8 052*	*99 113*	*18 284*	*65 929*	*11 684*	*15 340*	*19 774*	*18 845*	*43 897*	*6 943*	*307 861*	*14 094*	*189 703*	*19 691*	*40 388*	*14 578*	*16 148*

Sources: Statistics Portugal (*INE*); Portuguese Central Bank (*Banco de Portugal*).

Table 7. (continued) A SAM of Portugal in 2013 - level of disaggregation 1

(unit: millions of euros)

			p					dic						dik						dif	rw	Total
			p07	p08	p09	p10	total	h	nfc	fc	g	npi	total	h	nfc	fc	g	npi	total			
			19	20	21	22		23	24	25	26	27		28	29	30	31	32		33	34	
f	l	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	337	76 617
	o	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6 402	79 856
	total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*6 739*	*156 472*
a	a01	3	0	57	0	0	*8 052*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*8 052*
	a02	4	3	1 482	39	63	*99 113*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*99 113*
	a03	5	84	158	1	0	*18 284*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*18 284*
	a04	6	105	2 704	30	487	*65 929*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*65 929*
	a05	7	10	408	1	0	*11 684*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*11 684*
	a06	8	672	116	100	0	*15 340*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*15 340*
	a07	9	19 309	101	2	0	*19 774*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*19 774*
	a08	10	3	18 477	2	0	*18 845*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*18 845*
	a09	11	353	2 209	40 416	45	*43 897*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*43 897*
	a10	12	11	220	2	6 624	*6 943*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*6 943*
	total		*20 550*	*25 932*	*40 595*	*7 220*	*307 861*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*307 861*
p	p01	13	0	0	0	0	*0*	4 666	0	0	0	0	*4 666*	58	431	14	46	12	*561*	0	1 029	*14 094*
	p02	14	0	0	0	0	*0*	50 256	0	0	1 469	0	*51 725*	1 395	3 895	228	1 075	198	*6 792*	0	46 383	*189 703*
	p03	15	0	0	0	0	*0*	116	0	0	146	0	*262*	2 136	6 640	365	1 670	306	*11 118*	0	651	*19 691*
	p04	16	0	0	0	0	*0*	11 707	0	0	897	1	*12 605*	4	13	1	3	1	*22*	0	14 773	*40 388*
	p05	17	0	0	0	0	*0*	4 189	0	0	158	15	*4 362*	395	1 262	68	309	57	*2 091*	0	1 201	*14 578*
	p06	18	0	0	0	0	*0*	5 658	0	0	130	0	*5 788*	0	0	0	0	0	*0*	0	509	*16 148*
	p07	19	0	0	0	0	*0*	16 144	0	0	20	0	*16 164*	240	770	41	188	35	*1 273*	0	9	*20 566*
	p08	20	0	0	0	0	*0*	1 778	0	0	189	68	*2 034*	567	1 805	97	443	82	*2 994*	0	2 493	*29 531*
	p09	21	0	0	0	0	*0*	7 492	0	0	29 183	2 388	*39 063*	0	0	0	0	0	*0*	0	109	*40 751*
	p10	22	0	0	0	1	*0*	5 711	0	0	308	955	*6 973*	25	23	1	8	7	*64*	0	127	*8 483*
	total		*0*	*0*	*0*	*1*	*0*	*107 717*	*0*	*0*	*32 501*	*3 426*	*143 644*	*4 820*	*14 838*	*815*	*3 743*	*697*	*24 914*	*0*	*67 284*	*393 935*
dic	h	23	0	0	0	0	0	1 614	1 419	3 091	31 536	314	*37 974*	0	0	0	0	0	0	0	5 010	*160 528*
	nfc	24	0	0	0	0	0	1 419	0	397	82	0	*1 898*	0	0	0	0	0	0	0	19	*24 403*
	fc	25	0	0	0	0	0	2 849	663	1 127	36	27	*4 703*	0	0	0	0	0	0	0	531	*10 901*
	g	26	9	1 805	26	1 102	*20 607*	34 998	4 726	1 146	23	22	*40 915*	0	0	0	0	0	0	0	1 425	*63 844*
	npi	27	0	0	0	0	0	709	147	56	1 661	13	*2 585*	0	0	0	0	0	0	0	124	*3 482*
	total		*9*	*1 805*	*26*	*1 102*	*20 607*	*41 588*	*6 955*	*5 817*	*33 339*	*375*	*88 074*	0	0	0	0	0	0	0	*7 110*	*263 158*
dik	h	28	0	0	0	0	0	9 763	0	0	0	0	*9 763*	0	0	273	33	0	*306*	0	176	*10 245*
	nfc	29	0	0	0	0	0	0	17 316	0	0	0	*17 316*	0	0	9	397	0	*406*	0	807	*18 529*
	fc	30	0	0	0	0	0	0	0	4 246	0	0	*4 246*	0	0	241	748	0	*989*	0	12	*5 247*
	g	31	0	0	0	0	0	0	0	0	- 4 799	0	*- 4 799*	3	160	45	0	2	*211*	0	1 737	*- 2 851*
	npi	32	0	0	0	0	0	0	0	0	0	- 361	*- 361*	0	0	17	203	0	*219*	0	120	*- 22*
	total		0	0	0	0	0	*9 763*	*17 316*	*4 246*	*- 4 799*	*- 361*	*26 164*	*3*	*160*	*585*	*1 381*	*2*	*2 131*	0	*2 852*	*31 148*
dif		33	0	0	0	0	0	0	0	0	0	0	0	6 921	2 393	3 599	- 8 245	- 721	*3 946*	- 7 804	- 10 400	*- 14 259*
rw		34	7	1 793	130	161	*65 467*	1 460	133	838	2 803	42	*5 276*	- 1 499	1 138	248	270	0	*157*	- 6 455		*73 584*
Total			*20 566*	*29 531*	*40 751*	*8 483*	*393 935*	*160 528*	*24 404*	*10 900*	*63 844*	*3 482*	*263 158*	*10 245*	*18 529*	*5 247*	*- 2 851*	*- 22*	*31 148*	*- 14 259*	*73 584*	

Sources: Statistics Portugal (*INE*); Portuguese Central Bank (*Banco de Portugal*)

Table 8. The intermediate consumption of an activity-by-activity (or industry-by-industry) IOM of Portugal in 2013 - level of disaggregation 1

(unit: millions of euros)

	a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	total
Domestic (basic prices)											
a01	742	3 591	10	279	8	2	1	24	57	15	4 729
a02	1 398	24 802	2 530	5 361	494	178	128	727	2 557	389	38 564
a03	94	515	4 185	689	104	58	158	118	573	61	6 555
a04	466	8 179	616	8 671	756	422	63	1 126	2 587	416	23 302
a05	41	549	78	712	1 827	565	18	871	559	137	5 357
a06	121	1 251	515	1 781	140	3 315	398	876	460	98	8 953
a07	9	536	215	1 320	210	405	129	205	444	93	3 564
a08	168	2 638	470	3 602	1 340	856	112	2 889	1 813	518	14 406
a09	30	400	124	497	215	146	18	344	1 110	77	2 960
a10	28	107	23	189	79	125	5	78	147	341	1 123
total	3 096	42 566	8 766	23 102	5 171	6 073	1 030	7 258	10 307	2 144	109 513
Imports											
a01	344	1 629	1	89	1	0	0	7	22	7	2 100
a02	648	25 994	1 989	2 938	445	67	64	320	1 197	182	33 845
a03	2	91	71	17	3	1	3	4	11	1	204
a04	88	2 045	160	748	95	69	9	178	428	47	3 867
a05	8	139	16	145	307	126	4	197	103	27	1 071
a06	9	97	33	118	12	267	23	57	33	7	654
a07	0	2	1	3	1	1	0	1	1	0	10
a08	16	330	42	348	97	89	9	225	184	45	1 384
a09	2	101	3	21	5	6	0	13	19	2	172
a10	0	8	1	4	2	1	0	2	3	1	22
total	1 117	30 434	2 316	4 430	968	627	112	1 004	2 001	321	43 331
Total Flows (basic prices) - Intermediate Consumption (P2)											
a01	1 086	5 219	11	368	9	3	1	31	78	22	6 829
a02	2 046	50 797	4 519	8 299	938	245	193	1 047	3 754	571	72 409
a03	96	605	4 256	706	107	59	161	122	584	62	6 759
a04	553	10 224	776	9 419	851	491	72	1 304	3 015	463	27 169
a05	49	687	94	856	2 134	691	22	1 068	662	165	6 429
a06	129	1 347	547	1 899	152	3 581	421	932	493	105	9 607
a07	9	538	215	1 323	210	406	129	206	445	93	3 574
a08	184	2 968	512	3 950	1 437	945	120	3 114	1 997	563	15 790
a09	32	500	127	518	219	152	19	357	1 129	79	3 132
a10	28	115	24	193	81	127	5	80	150	342	1 145
total	4 213	73 001	11 082	27 532	6 139	6 700	1 143	8 262	12 308	2 465	152 844
Total Flows (purchaser's prices) - Intermediate Consumption (P2)											
total	4 510	73 714	11 533	29 216	6 467	7 085	1 200	8 726	12 987	2 654	158 093

Sources: Statistics Portugal (*INE*); World Input-Output Database (WIOD)

Note: In this table the structure of an aggregated version of the National Input-Output Table (industry-by-industry) released by WIOD in November 2016, is adapted to the totals of the Input-Output Table (product-by-product) released by *INE* in December 2016.

Table 9. The intermediate consumption of a product-by-product IOM of Portugal in 2013 - level of disaggregation 1

(unit: millions of euros)

	p01	p02	p03	p04	p05	p06	p07	p08	p09	p10	total
Domestic (basic prices)											
p01	638	3 577	0	154	2	0	0	28	39	21	4 460
p02	1 635	25 449	2 622	5 439	467	106	185	762	1 921	370	38 956
p03	94	444	4 964	691	107	58	289	125	522	58	7 352
p04	540	6 305	812	7 873	229	168	115	919	2 053	312	19 326
p05	38	496	71	628	2 071	471	33	1 233	415	133	5 586
p06	117	1 166	640	1 710	111	3 613	- 167	1 098	385	103	8 776
p07	1	442	107	1 186	176	363	184	201	368	85	3 113
p08	163	3 316	586	4 600	1 861	1 009	254	5 273	1 637	623	19 322
p09	10	78	21	102	131	53	7	106	1 021	28	1 557
p10	25	111	24	149	88	78	10	85	144	351	1 064
total	3 259	41 384	9 847	22 531	5 243	5 919	910	9 832	8 504	2 086	109 513
Imports											
p01	285	1 970	0	105	0	0	1	6	21	2	2 390
p02	439	29 278	1 246	2 613	592	15	45	334	1 400	171	36 133
p03	3	8	72	16	3	1	4	2	10	1	119
p04	4	104	22	952	28	25	3	82	67	16	1 303
p05	5	74	9	92	471	64	5	164	76	21	981
p06	7	94	35	98	7	191	- 11	54	44	7	526
p07	0	1	0	2	0	1	0	0	1	0	4
p08	7	274	58	439	143	108	18	432	174	52	1 706
p09	0	0	0	0	0	0	0	1	5	0	7
p10	0	4	0	5	41	0	0	5	22	83	161
total	750	31 807	1 443	4 323	1 285	405	65	1 079	1 820	354	43 331
Total Flows (basic prices) - Intermediate Consumption (P2)											
p01	922	5 547	1	259	2	0	1	34	60	23	6 850
p02	2 073	54 727	3 867	8 052	1 059	122	231	1 096	3 321	541	75 089
p03	97	452	5 036	708	110	58	293	127	531	59	7 472
p04	543	6 409	834	8 825	257	193	118	1 001	2 120	329	20 629
p05	43	570	80	719	2 542	535	38	1 397	491	154	6 568
p06	124	1 260	675	1 808	118	3 804	- 178	1 152	429	111	9 302
p07	1	442	107	1 188	176	364	184	202	368	85	3 118
p08	170	3 590	644	5 039	2 003	1 117	273	5 705	1 811	675	21 028
p09	10	79	21	102	131	53	7	107	1 026	28	1 564
p10	25	115	24	154	129	78	10	90	166	434	1 225
total	4 009	73 191	11 289	26 853	6 527	6 324	975	10 911	10 324	2 440	152 844
Total Flows (purchaser's prices) - Intermediate Consumption (P2)											
p01	1 023	6 261	1	391	3	0	1	43	86	30	7 838
p02	2 566	58 143	4 907	10 530	1 134	196	377	1 466	4 757	729	84 804
p03	104	453	5 037	714	110	71	321	128	654	68	7 660
p04	180	2 594	189	7 061	202	194	33	718	1 589	228	12 988
p05	47	582	86	750	2 544	645	42	1 427	624	177	6 925
p06	128	1 324	711	1 882	123	4 076	- 156	1 208	440	115	9 850
p07	1	443	107	1 188	176	364	185	202	368	85	3 120
p08	184	3 611	682	5 091	2 016	1 336	302	5 746	2 272	769	22 009
p09	10	79	21	102	131	54	7	107	1 039	28	1 579
p10	25	115	24	155	132	94	10	91	190	484	1 320
total	4 270	73 603	11 767	27 863	6 570	7 030	1 121	11 135	12 019	2 713	158 093

Source: Statistics Portugal (*INE*)

4. Evidences on the structural features of the socio-economic activity of a country

In Chapter 2, Section 2.2, a first approach was made to the structures of production, income distribution, investment, and transactions with the rest of the world, when we read the rows and the columns of the seven accounts of the level of disaggregation 0 of the SAM of Portugal in 2013 - Table 4. As we saw in Chapter 3, higher levels of disaggregation of the SAM and possible extensions and/or complementary information, such as IOM, will certainly improve our knowledge of those structures – Tables 7, 8 and 9 are illustrative of this for the case of Portugal in 2013.

An exhaustive reading of the rows and columns of Table 7, such as was done for the level of disaggregation 0 (Table 4), would be extensive and annoying and would be beyond the scope of this study. Thus, in transition between Chapters 2 and 3, in which a SAM and its possibilities of work were presented, and Chapter 5, in which multiplier effects on the distribution of generated income will be studied, in this chapter we examine the values in the proposed SAM that can be used to describe the structural features of the socio-economic activity of a country.

Returning to Chapter 2, and our previous analysis of Table 4, in the case of the aggregate income, associated with the compensation of the factors of production, which total 156,472 million Euros, from Table 7, now we can see that 76,617 million Euros was compensation of employees – row and column 1, and 79,856 million Euros account compensation of other factors of production, namely employers and the self-employed, land, and capital (including property income) – row and column 2. Row 1 shows that the total received as compensation of employees corresponded to a part of the gross added value[10] generated in the domestic activities by residents and non-residents, in the sum of 76,280 million Euros, to which are added 337 million Euros generated abroad by residents. In turn, row 2 shows that the total received as compensation of other factors of production corresponded to the other part of the gross added value[10] generated in the domestic activities by residents and non-residents, in the sum of 73,454 million Euros, to which 6,402 million Euros generated abroad by residents are added. Next we examine the part generated from domestic activities, disaggregated in 10 sectors, which will improve the information available for the study of the functional distribution of income of generated income, as shown in Table 10, to which was added some data from previous studies regarding the totals of factors since 1995.

Column 1 shows that the total paid as compensation of employees corresponded to a part of the gross national income generated in the domestic economy and abroad by residents that is received by households, in the sum of 76,246 million Euros, to which are added 371 million Euros generated in the domestic economy by non-residents and sent to the rest of the world.

[10] Without net taxes on production and imports.

In column 2, the total paid as compensation of other factors of production was decomposed in the part of the gross national income generated[10] in the domestic economy and abroad by residents which was received by the various institutional sectors, in the sum of 69,440 million Euros, to which are added 10,415 million Euros generated in the domestic economy by non-residents and sent to the rest of the world. From the part received by domestic institutional sectors, we can also identify the structure of the institutional distribution of generated income, as shown in Table 11, to which was added data regarding the total of factors in 2010 and 2011, from a previous study.

Table 10. Functional distribution of the generated income[11] in Portugal in 2013

Factors of Production [f] / Activities [a]		generated income, or gross added value, or gross domestic income (millions of euros)			structure of activities by factors (%)			structure of factors by activity (%)		
		Labour (employees) [l]	Other (employers and own-account workers; capital) [o]	total	Labour (employees) [l]	Other (employers and own-account workers; capital) [o]	total	Labour (employees) [l]	Other (employers and own-account workers; capital) [o]	total
Agriculture, forestry and fishing	[a01]	924	3 338	4 262	1.2	4.5	2.8	21.7	78.3	100.0
Industry, energy, water supply and sewerage	[a02]	12 252	12 848	25 100	16.1	17.5	16.8	48.8	51.2	100.0
Construction	[a03]	4 161	2 520	6 681	5.5	3.4	4.5	62.3	37.7	100.0
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[a04]	17 398	18 900	36 298	22.8	25.7	24.2	47.9	52.1	100.0
Information and communication	[a05]	2 603	2 538	5 141	3.4	3.5	3.4	50.6	49.4	100.0
Financial and insurance activities	[a06]	4 102	3 813	7 915	5.4	5.2	5.3	51.8	48.2	100.0
Real estate activities	[a07]	418	17 353	17 771	0.5	23.6	11.9	2.4	97.6	100.0
Professional, scientific and technical activities; administrative and support service activities	[a08]	6 727	3 304	10 031	8.8	4.5	6.7	67.1	32.9	100.0
Public administration and defence; compulsory social security; education; human health and social work activities	[a09]	24 702	7 167	31 869	32.4	9.8	21.3	77.5	22.5	100.0
Arts; entertainment; repair of household goods and other services	[a10]	2 993	1 672	4 665	3.9	2.3	3.1	64.2	35.8	100.0
total		76 280	73 454	149 733	100.0	100.0	100.0	50.9	49.1	100.0

Source: Table 7

2011	52.7	47.3	100.0
2010	53.3	46.7	100.0
2005	58.1	41.9	100.0
1995	54.5	45.5	100.0

Source: Santos (2010; 2015)

[11] The difference between the total gross domestic income presented in this table and the gross domestic product presented in Section 2.3 of Chapter 2 is the total net taxes on production and imports.

Table 11. Institutional distribution of the generated income[12] in Portugal in 2013

Factors of Production [f] / Domestic Institutions [dic]		generated income, or gross national income (millions of euros)			structure of institutions by factors (%)			structure of factors by institutions (%)		
		Labour (employees) [l]	Other (employers and own-account workers; capital) [o]	total	Labour (employees) [l]	Other (employers and own-account workers; capital) [o]	total	Labour (employees) [l]	Other (employers and own-account workers; capital) [o]	total
Households	[h]	76 246	41 299	117 544	100.0	59.5	80.7	64.9	35.1	100.0
Non-financial corporations	[nfc]	---	22 486	22 486	---	32.4	15.4	---	100.0	100.0
Financial corporations	[fc]	---	5 667	5 667	---	8.2	3.9	---	100.0	100.0
General government	[g]	---	- 784	- 784	---	-1.1	-0.5	---	100.0	100.0
Non-profit institutions serving households	[npi]	---	773	773	---	1.1	0.5	---	100.0	100.0
Total		76 246	69 440	145 686	100.0	100.0	100.0	52.3	47.7	100.0

Source: Table 7

2011	54.6	45.4	100.0
2010	56.1	43.9	100.0

Source: Santos (2015)

[12] The difference between the total gross national income presented in this table and the gross national product presented in Section 2.3 of Chapter 2 is the net taxes on production and imports received by the general government.

Continuing at the level of the production accounts, the activities account, of the level of disaggregation 0, is now disaggregated into ten activity sectors, or industries – rows and columns 3 to 12, with more detailed information regarding the production value (at basic prices), or output of goods and services (in rows) and the costs associated to the process of production (in columns), which total 307,861 million Euros for the Portuguese economy in 2013, as we had also seen in Chapter 2. Table 12, complemented by Table 13, show the structure of the former and Table 14, complemented by Tables 15, show the structure of the latter.

Table12. Output of industries (at basic prices) in Portugal in 2013 by goods and services

Activities (industries) [a] / Products (goods and services) of ... [p]		Agriculture, forestry ... [a01]		Industry, energy, ... [a02]		Construction [a03]		Wholesale and retail trade, ... [a04]		Information and communication [a05]		Financial and insurance ... [a06]		Real estate activities [a07]		Professional, scientific ... [a08]		Public administration.. [a09]		Arts; entertainment.. [a10]		Total (by product)	
		millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
Agriculture, forestry and fishing	[p01]	7 556	93.8	3	0.0	0	0.0	13	0.0	0	0.0	0	0.0	0	0.0	0	0.0	14	0.0	0	0.0	7 586	2.5
Industry, energy, water supply and sewerage	[p02]	298	3.7	95 574	96.4	148	0.8	1 914	2.9	100	0.9	0	0.0	0	0.0	16	0.1	64	0.1	0	0.0	98 115	31.9
Construction	[p03]	17	0.2	393	0.4	17 816	97.4	240	0.4	44	0.4	0	0.0	355	1.8	21	0.1	178	0.4	19	0.3	19 083	6.2
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[p04]	123	1.5	1 546	1.6	76	0.4	59 868	90.8	218	1.9	0	0.0	7	0.0	227	1.2	476	1.1	65	0.9	62 604	20.3
Information and communication	[p05]	0	0.0	9	0.0	0	0.0	528	0.8	10 904	93.3	98	0.6	0	0.0	99	0.5	142	0.3	1	0.0	11 782	3.8
Financial and insurance activities	[p06]	0	0.0	0	0.0	0	0.0	40	0.1	0	0.0	14 355	93.6	0	0.0	0	0.0	0	0.0	0	0.0	14 395	4.7
Real estate activities	[p07]	0	0.0	3	0.0	84	0.5	105	0.2	10	0.1	672	4.4	19 309	97.6	3	0.0	353	0.8	11	0.2	20 550	6.7
Professional, scientific and technical activities; administrative and support service activities	[p08]	57	0.7	1 482	1.5	158	0.9	2 704	4.1	408	3.5	116	0.8	101	0.5	18 477	98.0	2 209	5.0	220	3.2	25 932	8.4
Public administration and defence; compulsory social security; education; human health and social work activities	[p09]	0	0.0	39	0.0	1	0.0	30	0.0	1	0.0	100	0.7	2	0.0	2	0.0	40 416	92.1	2	0.0	40 595	13.2
Arts; entertainment; repair of household goods and other services	[p10]	0	0.0	63	0.1	0	0.0	487	0.7	0	0.0	0	0.0	0	0.0	0	0.0	45	0.1	6 624	95.4	7 220	2.3
Total [*a*. - production value] (by activity)		8 052	100.0	99 113	100.0	18 284	100.0	65 929	100.0	11 684	100.0	15 340	100.0	19 774	100.0	18 845	100.0	43 897	100.0	6 943	100.0	307 861	100.0
Total (by activity) and relative position		8 052	2.6	99 113	32.2	18 284	5.9	65 929	21.4	11 684	3.8	15 340	5.0	19 774	6.4	18 845	6.1	43 897	14.3	6 943	2.3	307 861	100.0

Source: Table 7

Table13. Output of institutions (at basic prices) in Portugal in 2013

Domestic Institutions	Output of goods and services (millions of euros)				structure of institutions by output (%)				structure of output by institutions (%)			
	Market Output	Output for own final use	Non-market output other than for final use	Total	Market Output	Output for own final use	Non-market output other than for final use	Total	Market Output	Output for own final use	Non-market output other than for final use	Total
Households	27 719	13 165	0	40 884	10.8	79.4	0.0	13.3	67.8	32.2	0.0	100.0
Non-financial corporations	209 082	1 868	0	210 949	81.7	11.3	0.0	68.5	99.1	0.9	0.0	100.0
Financial corporations	14 670	213	0	14 883	5.7	1.3	0.0	4.8	98.6	1.4	0.0	100.0
General government	4 276	1 240	30 194	35 710	1.7	7.5	85.5	11.6	12.0	3.5	84.6	100.0
Non-profit institutions serving households	229	104	5 101	5 435	0.1	0.6	14.5	1.8	4.2	1.9	93.9	100.0
Total	255 975	16 590	35 296	307 861	100.0	100.0	100.0	100.0	83.1	5.4	11.5	100.0

Source: Statistics Portugal (*INE*)

Table 14. Costs with the output of industries in Portugal in 2013

Activities (industries) [a] / Costs		Agriculture, forestry … [a01]		Industry, energy, … [a02]		Construction [a03]		Wholesale and retail trade, … [a04]		Information and communication [a05]		Financial and insurance … [a06]		Real estate activities [a07]		Professional, scientific … [a08]		Public administration.. [a09]		Arts; entertainment.. [a10]		Total	
		millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
Compensation of factors of production																							
Labour (employees)	[f,l]	924	11.5	12 252	12.4	4 161	22.8	17 398	26.4	2 603	22.3	4 102	26.7	418	2.1	6 727	35.7	24 702	56.3	2 993	43.1	76 280	24.8
Other (employers and own-account workers; capital)	[f,o]	3 338	41.5	12 848	13.0	2 520	13.8	18 900	28.7	2 538	21.7	3 813	24.9	17 353	87.8	3 304	17.5	7 167	16.3	1 672	24.1	73 454	23.9
total		4 262	52.9	25 100	25.3	6 681	36.5	36 298	55.1	5 141	44.0	7 915	51.6	17 771	89.9	10 031	53.2	31 869	72.6	4 665	67.2	149 733	48.6
Intermediate consumption (purchasers' prices), by products of ... [p]																							
Agriculture, forestry and fishing	[p01]	1 094	13.6	6 144	6.2	1	0.0	432	0.7	3	0.0	0	0.0	1	0.0	41	0.2	93	0.2	29	0.4	7 838	2.5
Industry, energy, water supply and sewerage	[p02]	2 655	33.0	57 648	58.2	4 811	26.3	11 183	17.0	1 150	9.8	197	1.3	423	2.1	1 126	6.0	4 933	11.2	677	9.8	84 804	27.5
Construction	[p03]	108	1.3	538	0.5	4 878	26.7	743	1.1	114	1.0	72	0.5	339	1.7	98	0.5	698	1.6	71	1.0	7 660	2.5
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[p04]	200	2.5	2 716	2.7	200	1.1	6 920	10.5	214	1.8	202	1.3	36	0.2	575	3.1	1 701	3.9	224	3.2	12 988	4.2
Information and communication	[p05]	52	0.6	624	0.6	88	0.5	914	1.4	2 431	20.8	664	4.3	43	0.2	1 188	6.3	744	1.7	177	2.5	6 925	2.2
Financial and insurance activities	[p06]	142	1.8	1 427	1.4	691	3.8	1 896	2.9	137	1.2	4 080	26.6	- 169	-0.9	1 026	5.4	506	1.2	115	1.6	9 850	3.2
Real estate activities	[p07]	6	0.1	458	0.5	105	0.6	1 180	1.8	171	1.5	367	2.4	184	0.9	169	0.9	401	0.9	80	1.2	3 120	1.0
Professional, scientific and technical activities; administrative and support service activities	[p08]	215	2.7	3 958	4.0	713	3.9	5 669	8.6	1 989	17.0	1 353	8.8	327	1.7	4 336	23.0	2 665	6.1	784	11.3	22 009	7.1
Public administration and defence; compulsory social security; education; human health and social work activities	[p09]	11	0.1	83	0.1	22	0.1	109	0.2	129	1.1	55	0.4	7	0.0	87	0.5	1 049	2.4	28	0.4	1 579	0.5
Arts; entertainment; repair of household goods and other services	[p10]	26	0.3	117	0.1	24	0.1	171	0.3	130	1.1	94	0.6	10	0.1	80	0.4	197	0.4	470	6.8	1 320	0.4
total		4 510	56.0	73 714	74.4	11 533	63.1	29 216	44.3	6 467	55.4	7 085	46.2	1 200	6.1	8 726	46.3	12 987	29.6	2 654	38.2	158 093	51.4
Net taxes on production, received(+)/paid(-) by government and the rest of the world	[dic,g] [rw]	- 720	-8.9	299	0.3	70	0.4	415	0.6	76	0.7	340	2.2	802	4.1	88	0.5	- 960	-2.2	- 377	-5.4	35	0.0
Total [*a* - total costs] (by industry)		8 052	100.0	99 113	100.0	18 284	100.0	65 929	100.0	11 684	100.0	15 340	100.0	19 774	100.0	18 845	100.0	43 897	100.0	6 943	100.0	307 861	100.0
Total and relative position		8 052	2.6	99 113	32.2	18 284	5.9	65 929	21.4	11 684	3.8	15 340	5.0	19 774	6.4	18 845	6.1	43 897	14.3	6 943	2.3	307 861	100.0

Source: Table 7

Table 15. Decomposition of intermediate consumption costs with the output of industries in Portugal in 2013

(Unit: %)

		[a01]	[a02]	[a03]	[a04]	[a05]	[a06]	[a07]	[a08]	[a09]	[a10]	total
Domestic (basic prices)												
Agriculture, forestry and fishing	[a01]	68.3	68.8	88.6	75.8	86.7	84.5	83.7	77.7	72.2	68.6	69.2
Industry, energy, water supply and sewerage	[a02]	68.3	48.8	56.0	64.6	52.6	72.7	66.6	69.4	68.1	68.1	53.3
Construction	[a03]	97.8	85.0	98.3	97.6	96.9	97.6	98.3	96.8	98.1	97.7	97.0
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[a04]	84.1	80.0	79.4	92.1	88.8	86.0	87.4	86.3	85.8	89.8	85.8
Information and communication	[a05]	83.8	79.8	83.3	83.1	85.6	81.8	83.7	81.5	84.4	83.4	83.3
Financial and insurance activities	[a06]	93.3	92.8	94.0	93.8	91.8	92.6	94.5	93.9	93.3	93.1	93.2
Real estate activities	[a07]	98.9	99.6	99.7	99.8	99.7	99.8	99.8	99.6	99.7	99.7	99.7
Professional, scientific and technical activities; administrative and support service activities	[a08]	91.5	88.9	91.8	91.2	93.2	90.6	92.8	92.8	90.8	92.0	91.2
Public administration and defence; compulsory social security; education; human health and social work activities	[a09]	92.6	79.9	97.3	96.0	97.8	96.3	97.8	96.4	98.3	97.4	94.5
Arts; entertainment; repair of household goods and other services	[a10]	99.1	93.0	96.9	98.0	97.8	99.0	98.3	97.6	98.0	99.7	98.1
total		73.5	58.3	79.1	83.9	84.2	90.6	90.2	87.9	83.7	87.0	71.7
Imports												
Agriculture, forestry and fishing	[a01]	31.7	31.2	11.4	24.2	13.3	15.5	16.3	22.3	27.8	31.4	30.8
Industry, energy, water supply and sewerage	[a02]	31.7	51.2	44.0	35.4	47.4	27.3	33.4	30.6	31.9	31.9	46.7
Construction	[a03]	2.2	15.0	1.7	2.4	3.1	2.4	1.7	3.2	1.9	2.3	3.0
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[a04]	15.9	20.0	20.6	7.9	11.2	14.0	12.6	13.7	14.2	10.2	14.2
Information and communication	[a05]	16.2	20.2	16.7	16.9	14.4	18.2	16.3	18.5	15.6	16.6	16.7
Financial and insurance activities	[a06]	6.7	7.2	6.0	6.2	8.2	7.4	5.5	6.1	6.7	6.9	6.8
Real estate activities	[a07]	1.1	0.4	0.3	0.2	0.3	0.2	0.2	0.4	0.3	0.3	0.3
Professional, scientific and technical activities; administrative and support service activities	[a08]	8.5	11.1	8.2	8.8	6.8	9.4	7.2	7.2	9.2	8.0	8.8
Public administration and defence; compulsory social security; education; human health and social work activities	[a09]	7.4	20.1	2.7	4.0	2.2	3.7	2.2	3.6	1.7	2.6	5.5
Arts; entertainment; repair of household goods and other services	[a10]	0.9	7.0	3.1	2.0	2.2	1.0	1.7	2.4	2.0	0.3	1.9
total		26.5	41.7	20.9	16.1	15.8	9.4	9.8	12.1	16.3	13.0	28.3

Source: Table 8

In the structure of the SAM base form, proposed in Chapter 2, at the level of disaggregation 0, besides the factors of production and activities accounts, the products account is the other of the three components of the production accounts. Similarly to what was done in the activities account, at the level of disaggregation 1, the products account is now disaggregated into ten products, or goods and services – rows and columns 13 to 22, allowing for more detailed information about the components of the aggregate demand (in row) and supply (in column) of the goods and services in the Portuguese economy in 2013, which was in the amount of 393,935 million Euros, as we saw in Chapter 2. Table 16, complemented by Table 17, show the structure of aggregate demand and Table 18 show the structure of aggregate supply. Within aggregate demand, the intermediate consumption can also be specified by Tables 14 and 15. Within aggregate supply, the output of goods and services can also be specified by Tables 12 and 13.

From the level of disaggregation 1 of the products account and considering what was exposed in Chapter 4 regarding the calculation of the Gross Domestic Product in the expenditure approach it is also possible to decompose that macroeconomic aggregate by goods and services, as shown by Table 19

Table 16. Aggregate demand of goods and services in Portugal in 2013

Products (goods and services) of ... [p] / Aggregate demand		Agriculture, forestry … [p01]		Industry, energy, … [p02]		Construction [p03]		Wholesale and retail trade, … [p04]		Information and communication [p05]		Financial and insurance … [p06]		Real estate activities [p07]		Professional, scientific … [p08]		Public administration.. [p09]		Arts; entertainment.. [p10]		Total	
		millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
Intermediate consumption, by industries [a]																							
Agriculture, forestry and fishing	[a01]	1 094	7.8	2 655	1.4	108	0.5	200	0.5	52	0.4	142	0.9	6	0.0	215	0.7	11	0.0	26	0.3	4 510	1.1
Industry, energy, water supply and sewerage	[a02]	6 144	43.6	57 648	30.4	538	2.7	2 716	6.7	624	4.3	1 427	8.8	458	2.2	3 958	13.4	83	0.2	117	1.4	73 714	18.7
Construction	[a03]	1	0.0	4 811	2.5	4 878	24.8	200	0.5	88	0.6	691	4.3	105	0.5	713	2.4	22	0.1	24	0.3	11 533	2.9
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[a04]	432	3.1	11 183	5.9	743	3.8	6 920	17.1	914	6.3	1 896	11.7	1 180	5.7	5 669	19.2	109	0.3	171	2.0	29 216	7.4
Information and communication	[a05]	3	0.0	1 150	0.6	114	0.6	214	0.5	2 431	16.7	137	0.8	171	0.8	1 989	6.7	129	0.3	130	1.5	6 467	1.6
Financial and insurance activities	[a06]	0	0.0	197	0.1	72	0.4	202	0.5	664	4.6	4 080	25.3	367	1.8	1 353	4.6	55	0.1	94	1.1	7 085	1.8
Real estate activities	[a07]	1	0.0	423	0.2	339	1.7	36	0.1	43	0.3	- 169	-1.0	184	0.9	327	1.1	7	0.0	10	0.1	1 200	0.3
Professional, scientific and technical activities; administrative and support service activities	[a08]	41	0.3	1 126	0.6	98	0.5	575	1.4	1 188	8.1	1 026	6.4	169	0.8	4 336	14.7	87	0.2	80	0.9	8 726	2.2
Public administration and defence; compulsory social security; education; human health and social work activities	[a09]	93	0.7	4 933	2.6	698	3.5	1 701	4.2	744	5.1	506	3.1	401	1.9	2 665	9.0	1 049	2.6	197	2.3	12 987	3.3
Arts; entertainment; repair of household goods and other services	[a10]	29	0.2	677	0.4	71	0.4	224	0.6	177	1.2	115	0.7	80	0.4	784	2.7	28	0.1	470	5.5	2 654	0.7
total		7 838	55.6	84 804	44.7	7 660	38.9	12 988	32.2	6 925	47.5	9 850	61.0	3 120	15.2	22 009	74.5	1 579	3.9	1 320	15.6	158 093	40.1
Final consumption, by domestic institutions, through current account [dic]																							
Households	[dic,h]	4 666	33.1	50 256	26.5	116	0.6	11 707	29.0	4 189	28.7	5 658	35.0	16 144	78.5	1 778	6.0	7 492	18.4	5 711	67.3	107 717	27.3
General government	[dic,g]	0	0.0	1 469	0.8	146	0.7	897	2.2	158	1.1	130	0.8	20	0.1	189	0.6	29 183	71.6	308	3.6	32 501	8.3
Non-profit institutions serving households	[dic,npi]	0	0.0	0	0.0	0	0.0	1	0.0	15	0.1	0	0.0	0	0.0	68	0.2	2 388	5.9	955	11.3	3 426	0.9
total		4 666	33.1	51 725	27.3	262	1.3	12 605	31.2	4 362	29.9	5 788	35.8	16 164	78.6	2 034	6.9	39 063	95.9	6 973	82.2	143 644	36.5
Gross capital formation, by domestic institutions, through capital account [dik]																							
Households	[dik,h]	58	0.4	1 395	0.7	2 136	10.8	4	0.0	395	2.7	0	0.0	240	1.2	567	1.9	0	0.0	25	0.3	4 820	1.2
Non-financial corporations	[dik,nfc]	431	3.1	3 895	2.1	6 640	33.7	13	0.0	1 262	8.7	0	0.0	770	3.7	1 805	6.1	0	0.0	23	0.3	14 838	3.8
Financial corporations	[dik,fc]	14	0.1	228	0.1	365	1.9	1	0.0	68	0.5	0	0.0	41	0.2	97	0.3	0	0.0	1	0.0	815	0.2
General government	[dik,g]	46	0.3	1 075	0.6	1 670	8.5	3	0.0	309	2.1	0	0.0	188	0.9	443	1.5	0	0.0	8	0.1	3 743	1.0
Non-profit institutions serving households	[dik,npi]	12	0.1	198	0.1	306	1.6	1	0.0	57	0.4	0	0.0	35	0.2	82	0.3	0	0.0	7	0.1	697	0.2
total		561	4.0	6 792	3.6	11 118	56.5	22	0.1	2 091	14.3	0	0.0	1 273	6.2	2 994	10.1	0	0.0	64	0.8	24 914	6.3
Exports	[rw]	1 029	7.3	46 383	24.5	651	3.3	14 773	36.6	1 201	8.2	509	3.2	9	0.0	2 493	8.4	109	0.3	127	1.5	67 284	21.9
Total (purchasers' prices) [*p* . - aggregate demand]		14 094	100.0	189 703	100.0	19 691	100.0	40 388	100.0	14 578	100.0	16 148	100.0	20 566	100.0	29 531	100.0	40 751	100.0	8 483	100.0	393 935	100.0
Total and relative position		14 094	3.6	189 703	48.2	19 691	5.0	40 388	10.3	14 578	3.7	16 148	4.1	20 566	5.2	29 531	7.5	40 751	10.3	8 483	2.2	393 935	100.0

Source: Table 7

Table 17. Decomposition of intermediate consumption of goods and services in Portugal in 2013

(Unit: %)

		[p01]	[p02]	[p03]	[p04]	[p05]	[p06]	[p07]	[p08]	[p09]	[p10]	total
Domestic (basic prices)												
Agriculture, forestry and fishing	[p01]	69.1	64.5	38.6	59.4	92.7	0.0	0.0	83.1	64.6	92.6	65.1
Industry, energy, water supply and sewerage	[p02]	78.8	46.5	67.8	67.5	44.1	87.3	80.4	69.5	57.8	68.4	51.9
Construction	[p03]	96.9	98.2	98.6	97.7	97.5	98.7	98.7	98.7	98.1	98.6	98.4
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[p04]	99.3	98.4	97.3	89.2	89.2	87.3	97.1	91.8	96.8	95.0	93.7
Information and communication	[p05]	87.3	87.0	88.4	87.2	81.5	88.0	87.9	88.3	84.5	86.2	85.1
Financial and insurance activities	[p06]	94.1	92.5	94.9	94.6	93.9	95.0	93.8	95.3	89.8	93.3	94.3
Real estate activities	[p07]	100.0	99.9	100.0	99.8	99.9	99.8	100.0	99.9	99.8	99.9	99.9
Professional, scientific and technical activities; administrative and support service activities	[p08]	95.8	92.4	91.0	91.3	92.9	90.3	93.3	92.4	90.4	92.3	91.9
Public administration and defence; compulsory social security; education; human health and social work activities	[p09]	99.8	99.8	99.6	99.7	99.9	99.5	99.5	99.5	99.5	99.5	99.6
Arts; entertainment; repair of household goods and other services	[p10]	99.3	96.6	99.9	96.8	68.2	99.9	99.7	94.0	86.7	80.8	86.9
total		81.3	56.5	87.2	83.9	80.3	93.6	93.3	90.1	82.4	85.5	71.7
Imports												
Agriculture, forestry and fishing	[p01]	30.9	35.5	61.4	40.6	7.3	0.0	100.0	16.9	35.4	7.4	34.9
Industry, energy, water supply and sewerage	[p02]	21.2	53.5	32.2	32.5	55.9	12.7	19.6	30.5	42.2	31.6	48.1
Construction	[p03]	3.1	1.8	1.4	2.3	2.5	1.3	1.3	1.3	1.9	1.4	1.6
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[p04]	0.7	1.6	2.7	10.8	10.8	12.7	2.9	8.2	3.2	5.0	6.3
Information and communication	[p05]	12.7	13.0	11.6	12.8	18.5	12.0	12.1	11.7	15.5	13.8	14.9
Financial and insurance activities	[p06]	5.9	7.5	5.1	5.4	6.1	5.0	6.2	4.7	10.2	6.7	5.7
Real estate activities	[p07]	0.0	0.1	0.0	0.2	0.1	0.2	0.0	0.1	0.2	0.1	0.1
Professional, scientific and technical activities; administrative and support service activities	[p08]	4.2	7.6	9.0	8.7	7.1	9.7	6.7	7.6	9.6	7.7	8.1
Public administration and defence; compulsory social security; education; human health and social work activities	[p09]	0.2	0.2	0.4	0.3	0.1	0.5	0.5	0.5	0.5	0.5	0.4
Arts; entertainment; repair of household goods and other services	[p10]	0.7	3.4	0.1	3.2	31.8	0.1	0.3	6.0	13.3	19.2	13.1
total		18.7	43.5	12.8	16.1	19.7	6.4	6.7	9.9	17.6	14.5	28.3

Source: Table 9

Table 18. Aggregate supply of goods and services in Portugal in 2013

Products (goods and services) of ... [p] / Aggregate supply		Agriculture, forestry … [p01]		Industry, energy, … [p02]		Construction [p03]		Wholesale and retail trade, … [p04]		Information and communication [p05]		Financial and insurance … [p06]		Real estate activities [p07]		Professional, scientific … [p08]		Public administration.. [p09]		Arts; entertainment.. [p10]		Total	
		millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
Output of goods and services (basic prices), by industries [a]																							
Agriculture, forestry and fishing	[a01]	7 556	53.6	298	0.2	17	0.1	123	0.3	0	0.0	0	0.0	0	0.0	57	0.2	0	0.0	0	0.0	8 052	2.0
Industry, energy, water supply and sewerage	[a02]	3	0.0	95 574	50.4	393	2.0	1 546	3.8	9	0.1	0	0.0	3	0.0	1 482	5.0	39	0.1	63	0.7	99 113	25.2
Construction	[a03]	0	0.0	148	0.1	17 816	90.5	76	0.2	0	0.0	0	0.0	84	0.4	158	0.5	1	0.0	0	0.0	18 284	4.6
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[a04]	13	0.1	1 914	1.0	240	1.2	59 868	148.2	528	3.6	40	0.2	105	0.5	2 704	9.2	30	0.1	487	5.7	65 929	16.7
Information and communication	[a05]	0	0.0	100	0.1	44	0.2	218	0.5	10 904	74.8	0	0.0	10	0.0	408	1.4	1	0.0	0	0.0	11 684	3.0
Financial and insurance activities	[a06]	0	0.0	0	0.0	0	0.0	0	0.0	98	0.7	14 355	88.9	672	3.3	116	0.4	100	0.2	0	0.0	15 340	3.9
Real estate activities	[a07]	0	0.0	0	0.0	355	1.8	7	0.0	0	0.0	0	0.0	19 309	93.9	101	0.3	2	0.0	0	0.0	19 774	5.0
Professional, scientific and technical activities; administrative and support service activities	[a08]	0	0.0	16	0.0	21	0.1	227	0.6	99	0.7	0	0.0	3	0.0	18 477	62.6	2	0.0	0	0.0	18 845	4.8
Public administration and defence; compulsory social security; education; human health and social work activities	[a09]	14	0.1	64	0.0	178	0.9	476	1.2	142	1.0	0	0.0	353	1.7	2 209	7.5	40 416	99.2	45	0.5	43 897	11.1
Arts; entertainment; repair of household goods and other services	[a10]	0	0.0	0	0.0	19	0.1	65	0.2	1	0.0	0	0.0	11	0.1	220	0.7	2	0.0	6 624	78.1	6 943	1.8
total		7 586	53.8	98 115	51.7	19 083	96.9	62 604	155.0	11 782	80.8	14 395	89.1	20 550	99.9	25 932	87.8	40 595	99.6	7 220	85.1	307 861	78.2
Trade and transport margins	[p]	3 128	22.2	24 774	13.1	0	0.0	-28 362	-70.2	459	3.1	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0
Net taxes on produtcs, received by government	[dic,g]	95	0.7	13 059	6.9	492	2.5	1 932	4.8	1 018	7.0	1 068	6.6	9	0.0	1 805	6.1	26	0.1	1 102	13.0	20 607	5.2
Imports and net taxes on produtcs, received by the rest of the world	[rw]	3 285	23.3	53 756	28.3	117	0.6	4 213	10.4	1 319	9.0	685	4.2	7	0.0	1 793	6.1	130	0.3	161	1.9	65 467	16.6
Total (purchasers' prices) [*p* - aggregate supply]		14 094	100.0	189 703	100.0	19 691	100.0	40 388	100.0	14 578	100.0	16 148	100.0	20 566	100.0	29 531	100.0	40 751	100.0	8 483	100.0	393 935	100.0
Total and relative position		14 094	3.6	189 703	48.2	19 691	5.0	40 388	10.3	14 578	3.7	16 148	4.1	20 566	5.2	29 531	7.5	40 751	10.3	8 483	2.2	393 935	100.0

Source: Table 7

Table 19. Decomposition by goods and services of Gross Domestic Product of Portugal in 2013

Products (goods and services) of ... [p]		Gross Domestic Product	
		millions of euros	%
Agriculture, forestry and fishing	[p01]	2 971	1.7
Industry, energy, water supply and sewerage	[p02]	51 077	30.0
Construction	[p03]	11 912	7.0
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[p04]	23 177	13.6
Information and communication	[p05]	6 329	3.7
Financial and insurance activities	[p06]	5 607	3.3
Real estate activities	[p07]	17 438	10.2
Professional, scientific and technical activities; administrative and support service activities	[p08]	5 719	3.4
Public administration and defence; compulsory social security; education; human health and social work activities	[p09]	39 042	22.9
Arts; entertainment; repair of household goods and other services	[p10]	6 997	4.1
Total		170 269	100.0

Source: Table 7

Within domestic institutions accounts, in the current account, as was mentioned in Chapter 2, we can see the origin (in row) and destination or use (in column) of the aggregate income of institutions, which was in the amount of 263,158 million Euros, in the case of Portugal in 2013. As was also seen in Chapter 3, at the level of disaggregation 1, our application has now five institutional sectors, providing more details to the available information to our study. Tables 20 and 21 show the structures of those two perspectives.

Table 20. Origin of aggregate income of institutions in Portugal in 2013

Domestic institutions (current account) [dic] / Origin of aggregate income	Households [h]		Non-financial corporations [nfc]		Financial corporations [fc]		General government [g]		Non-profit institutions serving households [npi]		Total	
	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
compensation of factors of production (gross national income)												
Labour (employees) [f,l]	76 246	46.5	0	0.0	0	0.0	0	0.0	0	0.0	76 246	29.0
Other (employers and own-account workers; capital) [f,o]	41 299	25.2	22 486	76.3	5 667	47.2	- 784	-1.4	773	60.8	69 440	26.4
total	117 544	71.6	22 486	76.3	5 667	47.2	- 784	-1.4	773	60.8	145 686	55.4
net taxes on production and imports												
from industries (total) [a]							1 682	3.0			1 682	0.6
from products (total) [p]							20 607	36.6			20 607	7.8
current transfers within domestic institutions												
Households [dic,h]	1 614	1.0	1 419	4.8	3 091	25.7	31 536	56.0	314	24.7	37 974	14.4
Non-financial corporations [dic,nfc]	1 419	0.9	0	0.0	397	3.3	82	0.1	0	0.0	1 898	0.7
Financial corporations [dic,fc]	2 849	1.7	663	2.3	1 127	9.4	36	0.1	27	2.1	4 703	1.8
General government [dic,g]	34 998	21.3	4 726	16.0	1 146	9.5	23	0.0	22	1.7	40 915	15.5
Non-profit institutions serving households [dic,npi]	709	0.4	147	0.5	56	0.5	1 661	3.0	13	1.0	2 585	1.0
total	41 588	25.3	6 955	23.6	5 817	48.4	33 339	59.2	375	29.5	88 074	33.5
current transfers from...												
Rest of the world [rw]	5 010	3.1	19	0.1	531	4.4	1 425	2.5	124	9.8	7 110	2.7
Total [*dic.* - aggregate income, received by domestic institutions]	164 143	100.0	29 461	100.0	12 014	100.0	56 268	100.0	1 272	100.0	263 158	100.0
Total and relative position	164 143	62.4	29 461	11.2	12 014	4.6	56 268	21.4	1 272	0.5	263 158	100.0

Source: Table 7

Table 21. Use of aggregate income of institutions in Portugal in 2013

Domestic institutions (current account) [dic] / Origin of aggregate income		Households [h]		Non-financial [nfc]		Financial [fc]		General government [g]		Non-profit institutions [npi]		Total	
		millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
final consumption													
Agriculture, forestry and fishing	[p01]	4 666	2.9	0	0.0	0	0.0	0	0.0	0	0.0	4 666	1.8
Industry, energy, water supply and sewerage	[p02]	50 256	31.3	0	0.0	0	0.0	1 469	2.3	0	0.0	51 725	19.7
Construction	[p03]	116	0.1	0	0.0	0	0.0	146	0.2	0	0.0	262	0.1
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[p04]	11 707	7.3	0	0.0	0	0.0	897	1.4	1	0.0	12 605	4.8
Information and communication	[p05]	4 189	2.6	0	0.0	0	0.0	158	0.2	15	0.4	4 362	1.7
Financial and insurance activities	[p06]	5 658	3.5	0	0.0	0	0.0	130	0.2	0	0.0	5 788	2.2
Real estate activities	[p07]	16 144	10.1	0	0.0	0	0.0	20	0.0	0	0.0	16 164	6.1
Professional, scientific and technical activities; administrative and support service activities	[p08]	1 778	1.1	0	0.0	0	0.0	189	0.3	68	1.9	2 034	0.8
Public administration and defence; compulsory social security; education; human health and social work activities	[p09]	7 492	4.7	0	0.0	0	0.0	29 183	45.7	2 388	68.6	39 063	14.8
Arts; entertainment; repair of household goods and other services	[p10]	5 711	3.6	0	0.0	0	0.0	308	0.5	955	27.4	6 973	2.6
total		107 717	67.1	0	0.0	0	0.0	32 501	50.9	3 426	98.4	143 644	54.6
current transfers within domestic institutions													
Households	[dic,h]	1 614	1.0	1 419	5.8	3 091	28.4	31 536	49.4	314	9.0	37 974	14.4
Non-financial corporations	[dic,nfc]	1 419	0.9	0	0.0	397	3.6	82	0.1	0	0.0	1 898	0.7
Financial corporations	[dic,fc]	2 849	1.8	663	2.7	1 127	10.3	36	0.1	27	0.8	4 703	1.8
General government	[dic,g]	34 998	21.8	4 726	19.4	1 146	10.5	23	0.0	22	0.6	40 915	15.5
Non-profit institutions serving households	[dic,npi]	709	0.4	147	0.6	56	0.5	1 661	2.6	13	0.4	2 585	1.0
total		41 588	25.9	6 955	28.5	5 817	53.4	33 339	52.2	375	10.8	88 074	33.5
current transfers to the ..													
Rest of the world	[rw]	1 460	0.9	133	0.5	838	7.7	2 803	4.4	42	1.2	5 276	2.0
gross savings													
Households	[dik,h]	9 763	6.1	0	0.0	0	0.0	0	0.0	0	0.0	9 763	3.7
Non-financial corporations	[dik,nfc]	0	0.0	17 316	71.0	0	0.0	0	0.0	0	0.0	17 316	6.6
Financial corporations	[dik,fc]	0	0.0	0	0.0	4 246	39.0	0	0.0	0	0.0	4 246	1.6
General government	[dik,g]	0	0.0	0	0.0	0	0.0	-4 799	-7.5	0	0.0	-4 799	-1.8
Non-profit institutions serving households	[dik,npi]	0	0.0	0	0.0	0	0.0	0	0.0	- 361	-10.4	- 361	-0.1
total		9 763	6.1	17 316	71.0	4 246	39.0	-4 799	-7.5	- 361	-10.4	26 164	9.9
Total [*.dic* - aggregate income, paid by domestic institutions]		160 528	100.0	24 404	100.0	10 900	100.0	63 844	100.0	3 482	100.0	263 158	100.0
Total and relative position		160 528	61.0	24 404	9.3	10 900	4.1	63 844	24.3	3 482	1.3	263 158	100.0

Source: Table 7

On the other hand, as was also mentioned in Chapter 3, Section 3.2, through the current account we can see how national income is transformed into disposable income through the receipt and payment of current transfers, and how the latter is distributed between final consumption and saving. As was explained in Chapter 2, Section 2.3, the disposable income is calculated outside the SAM and the corresponding amounts, as well as, the structures of its distribution and use, for the case of Portugal in 2013 can be seen in Table 22, to which was also added some data regarding use totals since 1995, from previous studies.

Table 22. Distribution and use of disposable income among institutions in Portugal in 2013

Domestic Institutions [dic]		Disposable Income			
		millions of euros	Distribution (%)	Use (%)	
				Final Consumption Expenditure	Saving
Households	[h]	117 203	69.2	91.7	8.3
Non-financial corporations	[nfc]	17 316	10.2	0.0	100.0
Financial corporations	[fc]	4 522	2.5	0.0	100.0
General government	[g]	27 702	16.3	117.3	-17.3
Non-profit institutions serving households	[npi]	3 065	1.8	111.8	-11.8
Total		169 808	100.0	84.6	15.4

Source: Table 5

2011	100.0	86.8	13.2
2010	100.0	89.0	11.0
2005	100.0	87.1	12.9
1995	100.0	79.3	9.2

Source: Santos (2010, 2015)

The other two of the three domestic institutions accounts, identified in Chapter 3, are the capital and the financial accounts, from which it is possible to obtain information on the investment, respectively, in non-financial and financial assets and the flows of funds associated to the corresponding acquisitions and disposals. Because it was not possible to disaggregate the financial account we will not explore the part relating to financial assets. We also will not explore directly the rest of the world account because the details associated with it and considered with interest for the purpose of this study were approached with the accounts previously worked.

Thus, returning to the capital account, as was seen in Chapter 2, we have the investment funds (in row) and the aggregate investment (in column) of institutions, which amounted 31,148 million Euros, in the case of Portugal in 2013. The corresponding structures can be seen in Tables 23 and 24.

Table 23. Investment funds in Portugal in 2013

Domestic institutions (current account) [dik] / Investment funds		Households [h]		Non-financial corporations [nfc]		Financial corporations [fc]		General government [g]		Non-profit institutions serving households [npi]		Total	
		millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
gross savings													
Households	[dic,h]	9 763	95.3	0	0.0	0	0.0	0	0.0	0	0.0	9 763	3.7
Non-financial corporations	[dic,nfc]	0	0.0	17 316	93.5	0	0.0	0	0.0	0	0.0	17 316	6.6
Financial corporations	[dic,fc]	0	0.0	0	0.0	4 246	80.9	0	0.0	0	0.0	4 246	1.6
General government	[dic,g]	0	0.0	0	0.0	0	0.0	-4 799	168.3	0	0.0	-4 799	-1.8
Non-profit institutions serving households	[dic,npi]	0	0.0	0	0.0	0	0.0	0	0.0	- 361	1613.6	- 361	-0.1
total		9 763	95.3	17 316	93.5	4 246	80.9	-4 799	168.3	- 361	1613.6	26 164	9.9
capital transfers within domestic institutions													
Households	[dik,h]	0	0.0	0	0.0	0	0.0	3	-0.1	0	0.0	3	0.0
Non-financial corporations	[dik,nfc]	0	0.0	0	0.0	0	0.0	160	-5.6	0	0.0	160	0.1
Financial corporations	[dik,fc]	273	2.7	9	0.0	241	4.6	45	-1.6	17	-74.0	585	0.2
General government	[dik,g]	33	0.3	397	2.1	748	14.3	0	0.0	203	-904.9	1 381	0.5
Non-profit institutions serving households	[dik,npi]	0	0.0	0	0.0	0	0.0	2	-0.1	0	0.0	2	0.0
total		306	3.0	406	2.2	989	18.9	211	-7.4	219	-979.0	2 131	0.8
capital transfers from...													
Rest of the world	[rw]	176	1.7	807	4.4	12	0.2	1 737	-60.9	120	-534.6	2 852	1.1
Total [*dik.* - investment funds]		10 245	100.0	18 529	100.0	5 247	100.0	-2 851	100.0	- 22	100.0	31 148	100.0
Total and relative position		10 245	32.9	18 529	59.5	5 247	16.8	-2 851	-9.2	- 22	-0.1	31 148	100.0

Source: Table 7

Table 24. Aggregate investment in Portugal in 2013

Domestic institutions (current account) [dik] / Aggregate investment		Households [h]		Non-financial corporations [nfc]		Financial corporations [fc]		General government [g]		Non-profit institutions serving households [npi]		Total	
		millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%	millions of euros	%
gross capital formation													
Agriculture, forestry and fishing	[p01]	58	0.6	431	2.3	14	0.3	46	-1.6	12	-54.6	561	1.8
Industry, energy, water supply and sewerage	[p02]	1 395	13.6	3 895	21.0	228	4.4	1 075	-37.7	198	-885.9	6 792	21.8
Construction	[p03]	2 136	20.9	6 640	35.8	365	7.0	1 670	-58.6	306	-1365.5	11 118	35.7
Wholesale and retail trade, repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	[p04]	4	0.0	13	0.1	1	0.0	3	-0.1	1	-2.6	22	0.1
Information and communication	[p05]	395	3.9	1 262	6.8	68	1.3	309	-10.8	57	-254.8	2 091	6.7
Financial and insurance activities	[p06]	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Real estate activities	[p07]	240	2.3	770	4.2	41	0.8	188	-6.6	35	-155.0	1 273	4.1
Professional, scientific and technical activities; administrative and support service activities	[p08]	567	5.5	1 805	9.7	97	1.9	443	-15.5	82	-365.2	2 994	9.6
Public administration and defence; compulsory social security; education; human health and social work activities	[p09]	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Arts; entertainment; repair of household goods and other services	[p10]	25	0.2	23	0.1	1	0.0	8	-0.3	7	-30.7	64	0.2
total		4 820	47.0	14 838	80.1	815	15.5	3 743	-131.3	697	-3114.3	24 914	80.0
capital transfers within domestic institutions													
Households	[dik,h]	0	0.0	0	0.0	273	5.2	33	-1.2	0	0.0	306	1.0
Non-financial corporations	[dik,nfc]	0	0.0	0	0.0	9	0.2	397	-13.9	0	0.0	406	1.3
Financial corporations	[dik,fc]	0	0.0	0	0.0	241	4.6	748	-26.2	0	0.0	989	3.2
General government	[dik,g]	3	0.0	160	0.9	45	0.9	0	0.0	2	-7.4	211	0.7
Non-profit institutions serving households	[dik,npi]	0	0.0	0	0.0	17	0.3	203	-7.1	0	0.0	219	0.7
total		3	0.0	160	0.9	585	11.1	1 381	-48.4	2	-7.4	2 131	6.8
capital transfers to ...													
Rest of the world	[rw]	-1 499	-14.6	1 138	6.1	248	4.7	270	-9.5	0	-0.1	157	0.5
net lending													
total	[f]	6 921	67.6	2 393	12.9	3 599	68.6	-8 245	289.2	- 721	3221.9	3 946	12.7
Total [*.dik* - aggregate investment]		10 245	100.0	18 529	100.0	5 247	100.0	-2 851	100.0	- 22	100.0	31 148	100.0
Total and relative position		10 245	32.9	18 529	59.5	5 247	16.8	-2 851	-9.2	- 22	-0.1	31 148	100.0

Source: Table 7

As was done in Santos (2013, 2012a and 2011), for example, the main items of income and expenditure of the institutional sectors and of the rest of the world can be identified from the respective rows and columns of the SAM, when it is, at least, at a first level of disaggregation, as shown in Table 7 for our application to Portugal in 2013. In the case of the institutional sectors, in which we can talk about balance sheets of the institutional sectors: the total balancing item is the corresponding net lending/borrowing; the current balancing item is the gross saving, and; the capital balancing item is the difference between the first and the second. In the case of the rest of the world we can talk about balance of payments.

5. Multiplier effects associated with the institutional distribution of income

Returning to the systematization previously adopted by Santos (2010, following 2004 and 2007), in keeping with the research of Pyatt and Roe (1977), and Pyatt and Round (1985), the approach adopted in this chapter will be based on the SAM and will be centered on the use of multipliers and their decomposition.

Thus, the following assumptions will be considered:

- The structural features for production and income distribution identified in Chapters 2 and 4 are the relevant ones.
- The production technology and resource endowment are provided.
- There is excess capacity in the economy.

Since income distribution includes redistribution, namely transfers within institutions, prices will not be separated from quantities. Therefore, the whole mathematical and analytical study will be made at the level of values. On the other hand, since the analysis will be static or comparatively static, data will be shown at current prices.

5.1. Methodology

As shown in Table 25, the SAM accounts will be classified and organized as exogenous and endogenous, and, consequently, the flows or transactions in each cell of the SAM will be considered exogenous or endogenous, according to the corresponding row and column accounts.

Table 25. The SAM in endogenous and exogenous accounts

		Expenditures				
		Endogenous		Exogenous		Total
			Sum		Sum	
Receipts	Endogenous	N	n	X	x	y_n
	Exogenous	L	l	R	r	y_x
	Total	y'_n		y'_x		

Source: Pyatt and Round (1985).

Where:

N = matrix of flows between endogenous accounts; n = vector of the (corresponding) row sums.

X = matrix of flows between exogenous and endogenous accounts (injections from first into second); x = vector of the (corresponding) row sums.

L = matrix of flows between endogenous and exogenous accounts (leakages from first into second); l = vector of the (corresponding) row sums.

R = matrix of flows between exogenous accounts; r = vector of the (corresponding) row sums.

y_n = vector (column) of the receipts of the endogenous accounts ($\hat{y}_n$: diagonal; $\hat{y}_n^{-1}$: inverse); y_n' = vector (row) of the expenditures of the same accounts.

y_x = vector (column) of the receipts of the exogenous accounts; y_x' = vector (row) of the expenditures of the same accounts.

From Table 25, it can be stated that

$$y_n = n + x \quad (1)$$

$$y_x = l + r \quad (2)$$

The amount that the endogenous accounts receive is equal to the amount that they spend (row totals equal column totals). In other words, in aggregate terms, total injections from the exogenous into the endogenous accounts (i.e. the column sum of "x") are equal to total leakages from the endogenous into the exogenous accounts, i.e. considering i' to be the unitary vector (row), the column sum of "1" is:

$$x * i' = l * i'. \quad (3)$$

In the structure of Table 25, if the entries in the N matrix are divided by the corresponding total expenditures, a corresponding matrix (squared) can be defined of the average expenditure propensities of the endogenous accounts within the endogenous accounts or of the use of resources within those accounts. Calling this matrix A_n, it can be stated that

$$A_n = N * \hat{y}_n^{-1} \quad (4)$$

$$N = A_{n*} \hat{y}_n \quad (5)$$

Considering equation (1), $y_n = A_{n*}y_n + x$ (6)

Therefore, $y_n = (I-A_n)^{-1} * x = M_a * x.$ (7)

We thus calculate the equation that provides the total receipts of the endogenous accounts (y_n), by multiplying the injections "x" by the matrix of the accounting multipliers:

$$M_a = (I-A_n)^{-1}. \quad (8)$$

On the other hand, if the entries in the L matrix are divided by the corresponding total expenditures, a corresponding matrix (not squared) can be defined of the average expenditure propensities of the endogenous accounts into the exogenous accounts, or of the use of resources from the endogenous accounts into the exogenous accounts. Calling this matrix A_l, it can be stated that

$$A_l = L*\hat{y}_n^{-1} \quad (9)$$

$$L = A_l* \hat{y}_n \quad (10)$$

Considering equation (2), $y_x = A_l*y_n + r$ (11)

Thus, $l = A_l * y_n = A_l * (I-A_n)^{-1} * x = A_l * M_a * x.$ (12)

Therefore, with the accounting multipliers, the impact of changes in receipts is analysed at the moment they occur, assuming that the structure of expenditure in the economy does not change.

Accounting multipliers can be decomposed, if we consider the A_n matrix and two other ones with the same size: B_n - with the diagonal of A_n, whilst all the other elements are null; and C_n - with a null diagonal, but with all the other elements of A_n. In this way, it can be stated that

$$A_n = B_n + C_n. \quad (13)$$

Thus, from equation (6):

$$y_n = B_n * y_n + C_n * y_n + x = [I - (I - B_n)^{-1} * C_n]^{-1} * (I - B_n)^{-1} * x \ [13]. \quad (14)$$

Therefore: $M_a = [I - (I - B_n)^{-1} * C_n]^{-1} * (I - B_n)^{-1} = M_3*M_2*M_1.$ (15)

The accounting multiplier matrix is thus decomposed into multiplicative components, each of which relates to a particular kind of connection in the system as a whole (Stone, 1985)[14].

- The intragroup or direct effects matrix, which represents the effects of the initial exogenous injection within the groups of accounts into which it had originally entered:

$$M_1 = (I - B_n)^{-1}. \quad (16)$$

[13] $y_n = A_{n*}y_n + x = B_{n*}y_n + C_{n*}y_n + x \Leftrightarrow y_n - B_{n*}y_n = C_{n*}y_n + x \Leftrightarrow y_n = (I-B_n)^{-1} * C_n * y_n + (I-B_n)^{-1} * x \Leftrightarrow y_n - (I-B_n)^{-1} * C_n * y_n = (I-B_n)^{-1} * x \Leftrightarrow y_n * [I - (I-B_n)^{-1} * C_n] = (I-B_n)^{-1} * x \Leftrightarrow y_n = [I - (I-B_n)^{-1} * C_n]^{-1} * (I-B_n)^{-1} * x.$

[14] For a detailed breakdown and explanation of these components, see, for example, Stone (1985, pp. 156-162); Pyatt and Round (1985, pp. 192-197); Santos (1999, pp. 67-69).

- The intergroup or indirect effects matrix, which represents the effects of the exogenous injection into the groups of accounts, after its repercussions have completed a tour through all the groups and returned to the one which they had originally entered. In other words, if we consider "t" to be the number of groups of accounts:

$$M_2 = \{I - [(I - B_n)^{-1} * C_n]^t\}^{-1}. \quad (17)$$

- The extragroup, or cross effects matrix, which represents the effects of the exogenous injection when it has completed a tour outside its original group without returning to it, or, in other words, when it has moved around the whole system and ended up in one of the other groups. Thus, for the "t" groups of accounts:

$$M_3 = \{I + [(I - B_n)^{-1} * C_n] + [(I - B_n)^{-1} * C_n]^2 + \ldots + [(I - B_n)^{-1} * C_n]^{t-1}\} \quad (18)$$

The decomposition of the accounting multipliers matrix can also be undertaken in an additive fashion, as follows:

$$M_a = I + (M_1 - I) + (M_2 - I) * M_1 + (M_3 - I) * M_2 * M_1 \quad (19)$$

where I represents the initial injection, and the remaining components are the additional effects associated, respectively, with the three components described above (M_1, M_2 and M_3).

Considering the methodology described above, in the application to our case study (Portugal in 2013), the classification of the SAM accounts into endogenous and exogenous was conditioned by the purpose of this part of our study, that is, the study of the multiplier effects of the socio-economic activity of a country associated with the institutional distribution of income. Therefore, the factors of production and the current account of domestic institutions were set as endogenous, and all the other SAM accounts as exogenous. Thus, in the exogenous part there is: production, represented by the activities and products SAM accounts; investment, represented by the capital and financial SAM accounts of domestic institutions, and; rest of the world.

The following analysis is based on the calculated multipliers, from which quantitative approximations of the effects of unitary changes (positive or negative) on the income of endogenous accounts will be identified, that is to say, in the compensation of the factors of production, and in the aggregate income of domestic institutions. We will try to bear in mind that the socio-economic activity of a country involves industries and institutions, as well as the network of linkages captured by the SAM that underlie these quantitative approximations. We will consider this network of linkages, as explained above and schematized in Chapter 2 - Outline 1, and the corresponding structural features, systematized in Chapter 4, whose detail depends on the disaggregation, extension, and complements of the SAM accounts, as was explained in Chapter 3.

5.2. Analysis

As was seen in the methodology, all the changes that can be experimented are in the X matrix of Table 25, that is to say, in the matrix of transactions between exogenous and endogenous accounts (injections from first into second). In our case study, this means that the possible changes that can be experimented are in: compensation of factors of production or gross added value; net taxes on production and products received by the general government; compensation of factors of production, and; current transfers received from the rest of the world[15].

The following analysis will be carried out on the effects of positive or negative unitary changes in the income of endogenous accounts. To simplify - in the reading of the quantitative approximations for the multiplier effects in our application, positive changes will be considered, whereby it is up to one to decide whether to read the effects of negative changes, with the possibility of applying the opposite mathematical sign.

Recalling that which was seen above, regarding the exogenous accounts, in the production accounts, the activities accounts record the output of goods and services and the costs associated with the process of production, and the products accounts record the demand and supply of goods and services. In domestic institutions accounts, the capital and the financial accounts record investment, respectively, in non-financial and financial assets and the flows of funds associated with the corresponding acquisitions and disposals. The rest of the world account records all the transactions between the resident and the non-resident actors, in all the other accounts.

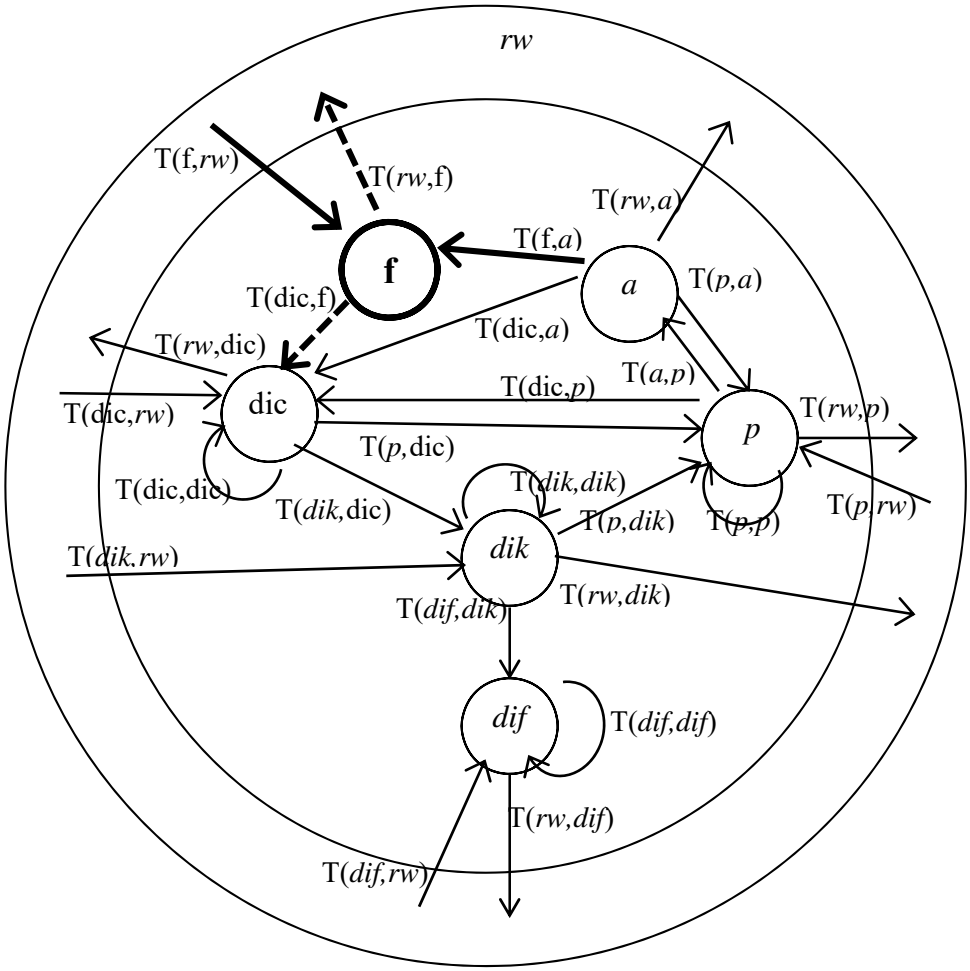
Initial direct effects will be identified through the average expenditure propensities and global effects through the accounting multipliers and its components.

Originating from Outline 1, Outlines 2 and 3 will help to identify the changes in each of the two endogenous groups of accounts in the study of the associated multiplier effects.

[15] It is easier to identify these flows at the level of disaggregation 0, through Tables 1 and 3, as well as Outlines 1 to 3, which are, respectively: T(f,a); T(dic,a); T(dic,p); T(f,rw); T(dic,rw).

a) Effects of changes in the income of factors of production account

Outline 2. A SAM base form (level of disaggregation 0) – schematic representation of the nominal flows between the accounts, presented and described in Tables 1 and 3, adapted to study a).



Source: Outline 1

Legend:

- exogenous groups of accounts are written in italic letters;
- thicker lines identify the group of accounts (circles) and the flows (arrows) that are first affected by the unitary change, or injection of income;
- thicker solid arrows represent the possible origins of that change, and thicker dashed lines represent the destinations of the same.

Note: the disaggregation from level 0 to level 1 underlies the transition from Outline 2 to Tables 26 to 28, and to the analysis of the results of the SAM-based approach to our case study.

In Outline 2, at the 0 level of disaggregation, the factors of production account is represented by f, which is disaggregated respectively into labour (l), and others (o), at level 1 of disaggregation, representing employees and other factors of production (employers and the self-employed; capital).

Following the solid thicker arrows of Outline 2, changes in the aggregate income received as compensation of factors of production can be made from the activities accounts (*a* at the level of disaggregation 0 and *a1-a10* at the level of disaggregation 1), and/or from the rest of the world account (*rw* at both levels of disaggregation). Therefore, these changes can have their origin, respectively, in the gross added value and/or in the compensation of factors of production received from the rest of the world. Establishing the link with the types of income identified in the Section 2.3 of Chapter 2, we are dealing with the income generated in the domestic economy by residents and non-residents [gross added value; T(f,*a*)], and in the rest of the world by residents [T(f,*rw*)].

Following the dashed thicker arrows of Outline 2, these changes will have initial direct effects both on the current account of domestic institutions (dic at the level of disaggregation 0, and h, nfc, fc, g and npi at the level of disaggregation 1) and on the rest of the world account (*rw* at both levels of disaggregation). These effects are quantified by the average expenditure propensities and are presented in Table 26.

Table 26. Initial direct effects of unitary exogenous changes in the aggregate income received as compensation of the factors of production

			Factors of Production [f]	Labour (employees) [l]	Other (employers and own-account workers; capital) [o]
Compensation (of factors of production)	received by domestic institutions (gross national income)	Households	[dic,h]	0.995	0.517
		Non-financial corporations	[dic,nfc]	0.000	0.282
		Financial corporations	[dic,fc]	0.000	0.071
		General government	[dic,g]	0.000	-0.010
		Non-profit institutions serving households	[dic,npi]	0.000	0.010
		total		0.995	0.870
	… sent to the rest of the world		[rw]	0.005	0.130
Total				1.000	1.000

Source: Table A.4.2.

Confirming the structural features of the institutional distribution of the generated income evidenced by Table 11, in Chapter 4 it can be seen that (initially) each additional unit of income generated by labour (employees) will directly add 0.995 to the income of households (domestic institutions - residents), the remaining 0.005 being sent to the rest of the world (the part generated in the economy by non-residents). In turn (initially), each additional unit of income generated by other factors of production (employers, own-account workers and capital) will directly add 0.87 to the income of domestic institutions (0.517 to households, 0.282 to non-financial corporations, 0.07 to others; the

residents), the remaining 0.13 being sent to the rest of the world (the part generated in the economy by non-residents).

However, the network of linkages associated with the current account of domestic institutions (dic) will generate multiplier effects, which in the end will have repercussions beyond the initial unit. The structural features of that network are evidenced in Tables 20 and 21, in Chapter 4, and a quantitative approximation of these effects is made in Table 27.

Table 27. Global effects of unitary exogenous changes in the aggregate income received as compensation of the factors of production

Factors of Production [f] / Aggregate Income, received by…		Labour (employees) [l]	Other (employers and own-account workers; capital) [o]
Households	[dic,h]	1.140	0.672
Non-financial corporations	[dic,nfc]	0.011	0.291
Financial corporations	[dic,fc]	0.023	0.102
General government	[dic,g]	0.253	0.204
Non-profit institutions serving households	[dic,npi]	0.012	0.020
Total		1.440	1.290

Source: Table A.4.3.

Therefore, after the initial direct effect, in which domestic institutions receive a part of the initial change (0.995 in labour and 0.87 in other factors), it will be used in final consumption [T(*p*,dic)], current transfers within domestic institutions [T(dic,dic)] and to the rest of the world [T(*rw*,dic)], or saved [T(*dik*,dic)]. These flows, which are income in the accounts of destination, will then have their initial direct effects and their corresponding uses. In this way, expenditures and incomes will be multiplied through the network of linkages that we have been studying, until such time as when the sources of income of domestic institutions are affected. The quantitative approximation of the global effect of that process on the aggregate income of domestic institutions, which is shown in Table 27, tells us that the global effects on the aggregate income of domestic institutions of unitary changes in the compensation of labour and other factors of production are, respectively, 1.440 (1.140 for households, 0.253 for general government, and 0.046 for the others), and 1.290 (0.672 for households, 0.291 for non-financial corporations, 0.2014 for general government, and 0.122 for the others).

In the decomposition of these effects, in which there are no intragroup or direct effects, as the initial injection is in the factors of production account, and not in the current account of domestic institutions, from Table 28 we can see that, except for the general government, the greater part of the total global effects are due to extragroup, or cross effects, that is to say, to effects in which the unitary

change in the compensation of factors of production moved around the whole system, without returning to the factors of production accounts. This is, certainly due to the redistributive process. In fact, the initial change is at the level of the generated income but the global change is at the level of aggregate income in which the current transfers (determinants of the disposable income) are included.

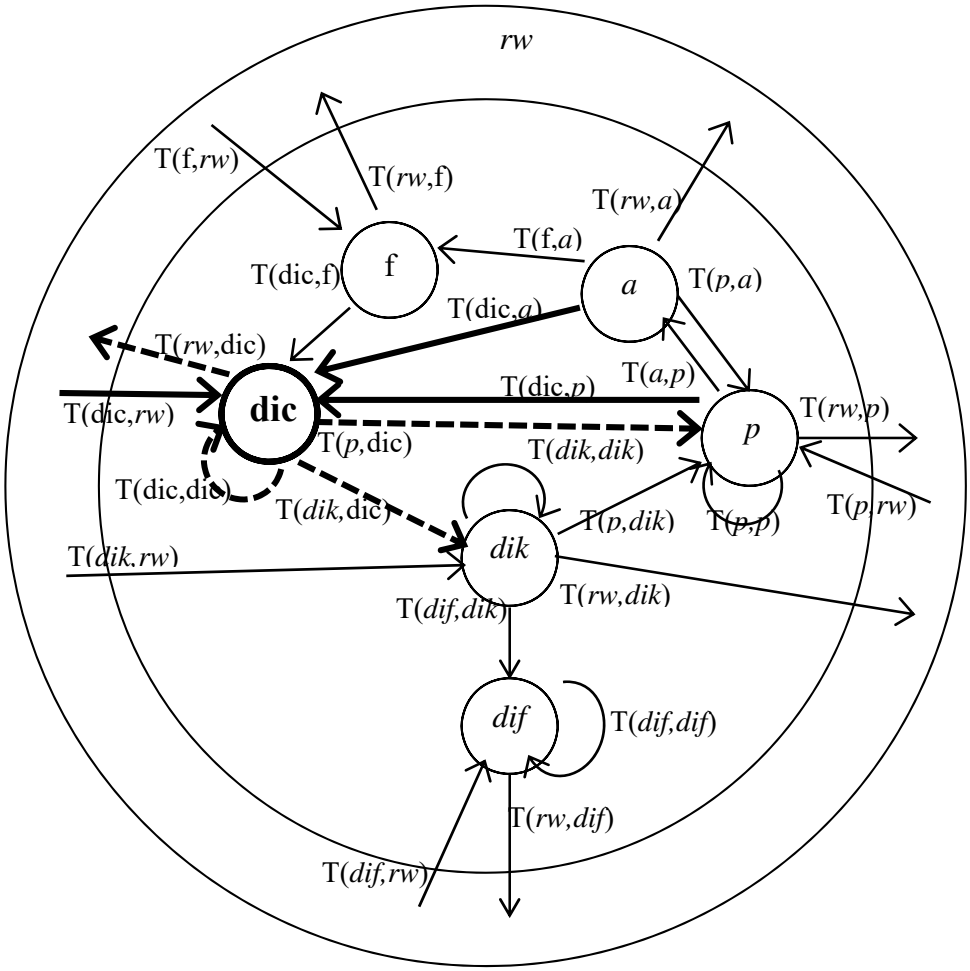
Table 28. Global effects decomposition of unitary exogenous changes in the aggregate income received as compensation of the factors of production

Factors of Production [f] / Aggregate Income, received by ..		Labour (employees) [l]		Other (employers and own-account workers; capital) [o]	
		intergroup or indirect effects	extragroup or cross effects	intergroup or indirect effects	extragroup or cross effects
Households	[dic,h]	0.003	1.137	0.043	0.630
Non-financial corporations	[dic,nfc]	0.010	0.001	0.008	0.283
Financial corporations	[dic,fc]	0.023	0.001	0.021	0.080
General government	[dic,g]	0.248	0.005	0.201	0.003
Non-profit institutions serving households	[dic,npi]	0.005	0.007	0.005	0.015
Total		0.289	1.150	0.278	1.012

Sources: Table A.4.4 to A.4.6.

b) Effects of changes in the income of the current account of domestic institutions

Outline 3. A SAM base form (level of disaggregation 0) – schematic representation of the nominal flows between the accounts, presented and described in Tables 1 and 3, adapted to study b).



Source: Outline 1

Legend:

- exogenous groups of accounts are written in italic letters;
- thicker lines identify the group of accounts (circles) and the flows (arrows) that are firstly affected by the unitary change, or injection of income;
- thicker solid arrows represent the possible origins of that change and thicker dashed lines represent the destinations of the same.

Note: the disaggregation from level 0 to level 1 is underlying to the transition from Outline 3 to Tables 29 to 31 and to the analysis of the results of the SAM-based approach to our case study.

In Outline 3, at the level of disaggregation 0, the current account of domestic institutions is represented by dic, which is disaggregated into households (h), non-financial corporations (nfc),

financial corporations (fc), general government (g), and non-profit institutions serving households (npi), at the level of disaggregation 1.

Following the solid thicker arrows of Outline 3, changes in the total aggregate income of domestic institutions can be made from the activities accounts (*a* at the level of disaggregation 0 and *a1-a10* at the level of disaggregation 1), from the products accounts (*p*, at the level of disaggregation 0 and *p1-p10* at the level of disaggregation 1), and/or from the rest of the world account (*rw* at both levels of disaggregation). Therefore, these changes can have their origin, respectively, in the net taxes on production, in the net taxes on products, or both, received by the general government, and/or in current transfers received from the rest of the world.

Following the dashed thicker arrows of Outline 3, these changes will have initial direct effects on the own current account of domestic institutions (dic at the level of disaggregation 0, and h, nfc, fc, g and npi at the level of disaggregation 1), on the rest of the world account (*rw* at both levels of disaggregation), on the products accounts (*p*, at the level of disaggregation 0 and *p1-p10* at the level of disaggregation 1), and on the capital account of domestic institutions (*dik*, at the level of disaggregation 0 and h, nfc, fc, g and npi at the level of disaggregation 1). These effect are quantified by the average expenditure propensities, and are presented in Table 29.

Table 29. Initial direct effects of unitary exogenous changes in the aggregate income received by domestic institutions

Domestic institutions (current account) [dic]			Households [h]	Non-financial corporations [nfc]	Financial corporations [fc]	General government [g]	Non-profit institutions serving households [npi]
Current transfers	within domestic institutions	Households [dic,h]	0.010	0.058	0.284	0.494	0.090
		Non-financial corporations [dic,nfc]	0.009	0.000	0.036	0.001	0.000
		Financial corporations [dic,fc]	0.018	0.027	0.103	0.001	0.008
		General government [dic,g]	0.218	0.194	0.105	0.000	0.006
		Non-profit institutions serving households [dic,npi]	0.004	0.006	0.005	0.026	0.004
		total	0.259	0.285	0.534	0.522	0.108
	… sent to the rest of the world [rw]		0.009	0.005	0.077	0.044	0.012
Final Consumption [p]			0.671	0.000	0.000	0.509	0.984
Gross Saving [dik,..]			0.061	0.710	0.389	-0.075	-0.104
Total			1.000	1.000	1.000	1.000	1.000

Source: Table A.4.2.

Note: The values of the final consumption by products can be seen in the source.

This results reveal the structural features of the use of aggregate income of institutions evidenced by Table 21, in Chapter 4. In an attempt to extract the main ideas from this results, without being

exhaustive, we see that (initially) the great part of each additional unit of income is spent in final consumption (npi: 0.984; h: 0.671; g: 0.509), except for financial and nonfinancial corporations. Transfers within domestic institutions are also relevant (fc: 0.543; g: 0.509; nfc 0.28; h: 0.259), with emphasis on the general government (certainly regarding taxes on income and wealth). The initial direct effect on gross saving is low or negative, except for non-financial corporations (0.710) and financial corporations (0.389).

From here, the associated network of linkages and the corresponding structural features, evidenced by Tables 20 and 21, in Chapter 4, will generate the already mentioned multiplier effects to which a quantitative approximation is made in Table 30. We are now working with the accounts in which the initial unitary change entered is included in the quantitative approximation to its global effects.

Table 30. Global effects of unitary exogenous changes in the aggregate income received by domestic institutions

Domestic institutions (current account) [dic] / Aggregate Income, received by…		Households [h]	Non-financial corporations [nfc]	Financial corporations [fc]	General government [g]	Non-profit institutions serving households [npi]
Households	[dic,h]	1.146	0.189	0.437	0.569	0.111
Non-financial corporations	[dic,nfc]	0.011	1.003	0.045	0.007	0.001
Financial corporations	[dic,fc]	0.023	0.034	1.126	0.012	0.011
General government	[dic,g]	0.255	0.239	0.223	1.127	0.032
Non-profit institutions serving households	[dic,npi]	0.012	0.013	0.014	0.032	1.005
Total		1.447	1.480	1.845	1.748	1.160

Source: Table A.4.3.

Now we have calculated the repercussions on the aggregate income of domestic institutions of a multiplier process which, except for the case of the non-financial and financial corporations, went mainly through the products account, affecting the demand and supply of goods and services (see the structural features evidenced in Tables 16 and 18, in Chapter 4) and through the capital account of domestic institutions, affecting investment funds and aggregate investment (see the structural features evidenced in Tables 23 and 24, in Chapter 4). The global effect is greater in the aggregate income of financial corporations (1.845) and of general government (1.748).

In the decomposition of those effects, as presented in Table 31, now without the initial unitary change, the intragroup or direct effects that represent the effects of the initial change within the current account of domestic institutions, in which it originally entered, is the second most important component, certainly reflecting the importance of the domestic transfers within domestic institutions, with the

consequent repercussions on the redistribution of income. As in a), the extragroup or cross effects are the most important component, that is to say, the effects in which the unitary change in the domestic institutions current account moved around the whole system without returning to it.

Although less significant, the intergroup or indirect effects, that is to say, the effects that return to the domestic institutions current account should not be neglected, mainly because they also are associated to the redistribution of income.

Table 31. Global effects decomposition of unitary exogenous changes in the aggregate income received by domestic institutions

Domestic institutions (current account) [dic] / Aggregate Income, received by…		Households [h]	Non-financial corporations [nfc]	Financial corporations [fc]	General government [g]	Non-profit institutions serving households [npi]
Intragroup or direct effects						
Households	[dic,h]	0.010	0.058	0.284	0.494	0.090
Non-financial corporations	[dic,nfc]	0.009	0.000	0.036	0.001	0.000
Financial corporations	[dic,fc]	0.018	0.027	0.103	0.001	0.008
General government	[dic,g]	0.218	0.194	0.105	0.000	0.006
Non-profit institutions serving households	[dic,npi]	0.004	0.006	0.005	0.026	0.004
Total		0.259	0.285	0.534	0.522	0.108
Intergroup or indirect effects						
Households	[dic,h]	0.132	0.120	0.071	0.005	0.007
Non-financial corporations	[dic,nfc]	0.001	0.002	0.003	0.005	0.001
Financial corporations	[dic,fc]	0.001	0.002	0.009	0.011	0.002
General government	[dic,g]	0.005	0.019	0.088	0.124	0.024
Non-profit institutions serving households	[dic,npi]	0.007	0.006	0.005	0.003	0.001
Total		0.146	0.149	0.177	0.148	0.034
Extragroup or cross effects						
Households	[dic,h]	0.003	0.069	0.367	0.565	0.104
Non-financial corporations	[dic,nfc]	0.010	0.001	0.042	0.002	0.000
Financial corporations	[dic,fc]	0.023	0.033	0.002	0.001	0.009
General government	[dic,g]	0.249	0.221	0.134	0.003	0.008
Non-profit institutions serving households	[dic,npi]	0.005	0.007	0.008	0.029	0.001
Total		0.291	0.331	0.553	0.600	0.122

Sources: Table A.4.4 to A.4.6.

Both in a) and in b), it is important not to forget that, although the structural features of the socio-economic activity of a country – Portugal in 2013 in this case – are influencing the results of the studied effects, the change of these structural features is not assumed by the methodology adopted in

our modelling exercise. On the other hand, many effects will surely be lost on the part of the network of linkages captured by the SAM that was set as exogenous. However, it was possible to evidence some aspects of the multiplier effects associated with the socio-economic activity of a country, and its underlying structural features, namely the institutional distribution of income.

On the other hand, it was also possible to identify a direct interconnection between functional and institutional distribution income, the former being only associated with generated income, and the latter is associated both with generated and disposable income. As previously mentioned, generated income is the gross added value generated by industries (or activities), through the use of factors of production - represented in Outlines 1 to 3 by T(f,*a*), and T(f,*rw*). Therefore, the study of the (institutional) redistribution of income cannot neglect the interconnection between functional and institutional distribution of the generated income.

Further research should be carried out in organising endogenous and exogenous accounts in different ways, in order to evidence the multiplier effects of parts with other structural features.

6. Summary and concluding remarks

A study using a matrix format with the complexity of the network of linkages of the monetary flows underlying the activity of a country undeniably has potential. Such a potential is increased when we are able to include in that study production and institutions simultaneously, at levels of detail, and with specificities controlled by us, even if this is conditioned by the information available.

Being the SAM a working instrument with the above-mentioned potential, my challenge is to contribute to the definition of a methodology that allows its adoption and manipulation by as many users as possible, thus contributing to improve the knowledge about different aspects of the so-called socio-economic activity of a country. In line with my previous research, this paper aims to progress the topic one more step, as this time it complements the SAM with the Input-Output Matrix (IOM)[16] to specify the linkages within industries related with the intermediate consumption costs with the corresponding outputs, and also to decompose the part of aggregate demand that relates to the intermediate consumption of goods and services.

Similar to my previous research, a top-down approach was adopted, and the National Accounts were used as the base source of information. Following the rules and the nomenclatures of the latest version of the SNA (ISWGNA, 2009), a SAM base form was schematically represented as a summary of all the flows measured by the National Accounts, from which the levels of detail can be chosen, through

[16] Similarly, some experiments to complement the SAM with the Socio Demographic Matrix were carried out previously, as can be seen in Santos (2016 and 2014).

disaggregation, extension, and complements. This allows one to evidence those structural features that can be very useful to understand and study the socio-economic activity of a country.

Therefore, as the National Accounts are produced in a more or less complete and adapted way for almost every country in the world, and as its disclosure is regular, (at least partially) free, and credible, the adoption of the proposed methodology becomes accessible to a great number of users and can have more uses. However, the limitations and inaccuracies of SNA and the implicit adoption of the corresponding underlying theoretical model should not be neglected.

The traditional macroeconomic aggregates (GDP, GNI, DI, etc.) and types of income were identified from the SAM, thus facilitating research covering the production and generation of income, as well as its corresponding distribution, redistribution and accumulation. All of this is accompanied by the underlying structural features, whose details and use depend on the numerical and algebraic versions adopted in the SAM(and/or IOM)-based approach to the aspects to be studied.

The structural features of the functional and institutional distribution of the generated income which is evidenced through the factors of production SAM accounts, allow us to identify how the compensation of factors of production (labour – employees, employers and self-employed workers; and capital) is distributed within industries and institutions, as well as what is categorised as domestic (generated in the country[17], by residents and non-residents) and national (generated in the country and in the rest of the world by residents). From the point of view of income distribution, the factors of production SAM accounts are crucial for a socio-economic activity of a country perspective (i.e., when production and institutions are considered together for the study of the monetary flows that underlie the activity of a country), because they establish the link between production and everything else – in other words, between the generation, distribution, and use of income. Regarding production, the activities (or industries) SAM accounts provide the output of goods and services and the associated costs, whose details can be complemented with an industry-by-industry IOM of domestic and imported intermediate consumption by, and between industries. The structural features evidenced by this part are determinant for a study about the influence of production and generation of income on the distribution of income.

On the other hand, for a study on the monetary flows of the activity of a country, the specification of the market of goods and services, as given by the products SAM accounts, cannot be neglected, not only on account of its implicit connection to the generation of income, through the output and the intermediate consumption of goods and services, but also due to its role in the use of disposable

[17] Or 'economic territory', commonly defined as "the area under the effective economic control of a single government" (paragraph 26.25, ISWGNA, 2009; paragraph 26.26, gives some more details about the definition).

income, through final consumption, and gross capital formation. Underlying all these aspects are also the imports and exports of goods and services, which are very important for the knowledge of the relations between the country and the rest of the world. In this case, a product-by-product IOM can complement the details regarding the domestic and imported intermediate consumption of goods and services.

Therefore, through the SAM production accounts (factors of production, activities and products) we can study the generation of income and the corresponding functional and institutional distribution, as well as the use of the disposable income of institutions in the market of goods and services. For this part, IOMs can complement the details regarding domestic and imported intermediate consumption of activities (industries) and of products (goods and services).

However, it is through the current account of domestic institutions that is possible to study the transition from the institutional distribution of the generated income to the (institutional distribution of) disposable income, as well as the details of the origin and use of the so-called aggregate income of the institutions. The aggregate income, expressed as the row and column totals of that account, is the (national) generated income[18] added to net taxes on products and imports (for the case of the general government) and current transfers received by domestic institutions from domestic institutions and from the rest of the world.

Finally, the institutional distribution of the so-called accumulated income (income associated to investment) can be studied through the remaining two SAM accounts. Thus, the inflows and the outflows associated with the investment in non-financial and financial assets of domestic institutions can be studied through the capital and financial accounts, respectively. This is the part that was less-explored previously in the scope of this research, mainly due to the unavailability of the "from-whom-to-whom" matrices for the financial transactions of domestic institutions in the last decades for my case study - Portugal. However, considering the importance that investment can have on production capacity and, consequently, on the generation of income, it warrants its place in the study of the socio-economic activity of a country and will be one of my future research priorities.

Therefore, depending on the disaggregation, extension and complements of the SAM accounts, more-or-less complex networks of linkages of flows with different intensities can be constructed for specific periods and geographical areas, evidencing the underlying structural features and enabling the study of the associated multiplier effects. This was experimented for Portugal in 2013, for a so-called level of disaggregation 1, representing: two factors of production – labour (employees) and others; ten products (goods and services); ten activities (industries); five domestic institutions – households,

[18] Generated by residents in the economic territory and in rest of the world.

nonfinancial corporations, financial corporations, government and non-profit institutions serving households; and the rest of the world. With domestic institutions being organized in current, capital and financial accounts, a SAM with thirty four rows and columns allowed for a SAM-based approach to the multiplier effects associated to the institutional distribution of income.

In this approach, a numerical version was converted into an algebraic version that is consistent with an accounting multipliers methodology, which has been adapted to the study of the above-mentioned effects. The then-identified quantitative approximations of the effects of unitary changes on the compensation of the factors of production and on the aggregate income of domestic institutions revealed a close relation with the structural features evidenced by the numerical SAM version. A direct interconnection between functional and institutional distribution income was also evidenced.

As the functional distribution of income is associated to the generated income and the institutional distribution of income associated with both generated and disposable income, the study of the institutional distribution of income implicitly involves the corresponding functional distribution. Thus, as the latter is a consequence of the production process and structure, its study must also be considered, whilst not neglecting the contribution that can be provided by the complementary IOMs.

Therefore, a SAM-based approach to the monetary or nominal flows between production and institutions that occurs in a particular geographical space was proposed, and the underlying methodology was exposed.

It was shown how the SAM numerical versions allow for the reading of the reality under study, and how details can be added to that reading through disaggregation, extension, and complements of the SAM accounts. It is also worth mentioning the importance of the possible comparisons in time and space, which is implicitly enabled through the adoption of the National Accounts and underlying SNA in the construction of the SAMs (and IOMs).

Interventions regarding the functioning of that same reality were experimented through using a SAM algebraic version, based on accounting multipliers.

In this paper special attention was given, on the one hand, to the structural features of the socio-economic activity of a country, which was evidenced using a SAM numerical version, and, on the other hand, to the multiplier effects that some of these structural features generate, which was evidenced using a SAM algebraic version. Regarding the application to Portugal in 2013 (our case study), I wish that it could have been possible to work with more disaggregated “other factors of production” and “financial account of domestic institutions”, as well as with a SAM-based model (or SAM algebraic version) which would have allowed structural changes and which not have such restrictive assumptions. These are limitations to the way that the whole explanation was illustrated,

and they are seen as being guidelines for future research, all of which would resume previous research[19].

Other aspects, which so far have not gone beyond my research intentions, could also provide a great contribution for the knowledge of the socio-economic activity of a country, namely: add stocks to flows and study wealth and income[20]; articulate, in some way, the modelling of the SAM with the modelling of some of the complements used for the study of specific details – in the case of this paper, the IOM; explore the possibility of working with the personal distribution of income in a SAM framework – together with the institutional distribution of income, in order to study problems such as poverty and corruption; identify and evaluate flows that are representative of the socio-economic activity of a country (in the sense that they affect, directly or indirectly, the generation of income), yet are not measured or calculated through imputations with the National Accounts -namely non-paid work or mixed income.

The potential of a SAM for the knowledge of the socio-economic activity of a country is undeniable.

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[19] For example: Santos (2016) works with the "other factors of production" account disaggregated in: informal labour (employers and own-account (or self-employed) workers) and capital; Santos (1999) works with the "financial account of domestic institutions" disaggregated in the five domestic institutions considered here for the current and the capital accounts; and Santos (2009 and 2012a) works with a SAM-based model that designate initially of linear, and after of master.

[20] Pyatt (1991a) addressed this in a way somewhat similar to that provided in a Socio Demographic Matrix for flows and stocks of persons, as proposed by Stone (1986a and 1975), and applied by Santos (2016 and 2014), as mentioned above.

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APPENDICES

A.1. Integrated Economic Accounts Table of Portugal in 2013

(Unit: millions of euros)

Current accounts
Uses

Accounts	Total	Goods and Services Account (Resources)	S.2 Rest of the World Account	S.1 Total of the Economy	S.15 NPISHs	S.14 Households	S.13 General Government	S.12 Financial Corporations	S.11 Non-Financial Corporations	Code	Transactions and other flows, stocks and balancing items
I. Production / external account of goods and services	65 573	65 573								P.7	Imports of goods and services
	67 284		67 284							P.6	Exports of goods and services
	307 861	307 861								P.1	Output of goods and services
	158 093			158 093	2 402	6 517	9 611	6 847	132 715	P.2	Intermediate consumption
	20 501	20 501								D.21-D.31	Net taxes on products
	149 768			149 768	3 033	34 367	26 099	8 036	78 234	B.1g	Gross added value
				170 269						B.1*g	Gross domestic product
	29 884			29 884	557	9 110	5 092	859	14 266	P.51c	Consumption of fixed capital
	119 884			119 884	2 476	25 257	21 007	7 177	63 968	B.1n	Value added, net
				140 385						B.1*n	Net domestic product
			- 1 711							B.11	External balance of goods and services
II.1.1. Generation of income account	76 617		337	76 280	2 847	2 941	21 317	4 110	45 065	D.1	Compensation of employees
	35			35	- 371	227	- 574	330	423	D.2-D.3	Net taxes on production and imports
	2 581			2 581	4	849		336	1 392	D.2	Taxes on Production and Imports
										D.21	Taxes on Products
										D.29	Other Taxes on Production
	- 2 546			- 2 546	- 375	- 622	- 574	- 6	- 969	D.3	Subsidies
										D.31	Subsidies on Products
										D.39	Other Subsidies on Production
				73 454	557	31 198	5 356	3 596	32 746	B.2g+B3g	Gross operating surplus and Gross mixed income
	54 333			54 333	557	12 078	5 356	3 596	32 746	B.2g	Gross operating surplus
	19 120			19 120		19 120				B.3g	Gross mixed income
	28 041			28 041	557	7 267	5 092	859	14 266	P.51c1	Consumption of fixed capital on gross operating surplus
	1 843			1 843		1 843				P.51c2	Consumption of fixed capital on gross mixed income
	26 292			26 292		4 811	264	2 737	18 480	B.2n	Net operating surplus
	17 277			17 277		17 277				B.3n	Net mixed income
II.1.2. Allocation of primary income account	54 537		6 402	48 135	22	4 161	8 271	17 902	17 778	D.4	Property income
	167 975			167 975	773	117 544	21 505	5 667	22 486	B.5g	Gross national income/ Gross balance of primary incomes
	138 090			138 090	216	108 435	16 413	4 807	8 220	B.5n	Net national income/ Net balance of primary incomes
II.2. Secondary distribution income account	19 688		415	19 273	6	13 555	23	1 221	4 468	D.5	Current taxes on income, wealth, etc
	24 284		107	24 177		24 177				D.61	Social contributions
	34 955		102	34 853	314	15	31 520	1 586	1 419	D.62	Social benefits other than social transfers
	21 256		6 486	14 771	97	5 302	4 599	3 572	1 201	D.7	Other current transfers
	169 808			169 808	3 065	117 203	27 702	4 522	17 316	B.6g	Gross disposable income
	139 924			139 924	2 508	108 094	22 610	3 663	3 050	B.6n	Net disposable income
II.3. Redistribution of income in kind account	20 843			20 843	3 426		17 417			D.63	Social transfers in kind
	169 808			169 808	- 361	138 047	10 285	4 522	17 316	B.7g	Gross adjusted disposable income
	139 924			139 924	- 918	128 937	5 193	3 663	3 050	B.7n	Net adjusted disposable income
II.4. Use of income account	169 808			169 808	3 065	117 203	27 702	4 522	17 316	B.6g	Gross disposable income
	139 924			139 924	2 508	108 094	22 610	3 663	3 050	B.6n	Net disposable income
	143 644			143 644		128 560	15 084			P.4	Actual Final Consumption
	143 644			143 644	3 426	107 717	32 501			P.3	Final consumption expenditure
	276			276				276		D.8	Adjustment for the change in the net
	26 164			26 164	- 361	9 763	- 4 799	4 246	17 316	B.8g	Gross saving
	- 3 720			- 3 720	- 918	653	- 9 891	3 386	3 050	B.8n	Net saving
			- 1 250							B.12	Current external balance

Accumulation accounts
Changes in Assets

III.1.1. Change in net worth due to saving and capital transfers account										B.8n	Net saving
										B.12	Current external balance
										D.9r	Capital transfers, receivable
										D.9p	Capital transfers, payable (-)
	- 4 970		- 3 885	- 1 086	- 581	1 132	- 9 489	3 802	4 050	B.10.1	Changes in net worth due to saving and capital transfers
III.1.2 Acquisitions of non-financial assets account	25 122			25 122	685	4 732	3 701	816	15 189	P.51g	Gross fixed capital formation
	- 29 884			- 29 884	- 557	- 9 110	- 5 092	- 859	- 14 266	P.51c	Consumption of fixed capital (-)
	- 289			- 289	- 2	43	32		- 363	P.52	Changes in inventories
	81			81	14	45	10		12	P.53	Acquisitions less disposals of valuables
	0		61	- 61		- 1 499	105	248	1 085	NP	Acquisitions less disposals of non-produced non-financial assets
	0		- 3 946	3 946	- 721	6 921	- 8 245	3 599	2 393	B.9	Net lending (+) /borrowing (-)

			S.2	S.1	S.15 + S.14	S.13	S.12	S.11		
III.2 Financial account	- 23 432		- 10 400	- 13 032	- 8 417	- 2 426	- 11 945	9 756		Net acquisition of financial assets\ Net incurrence of liabilities
	- 1		0	- 1			- 1		F.1	Monetary gold and SDRs
	- 28 445		- 23 658	- 4 787	3 016	1 211	- 11 379	2 365	F.2	Currency and deposits
	- 9 744		- 2	- 9 743	- 5 228	- 961	- 4 248	694	F.3	Debt securities
	2 398		11 803	- 9 405	- 2 891	40	- 9 430	2 876	F.4	Loans
	5 464		1 859	3 604	- 2 988	- 756	6 214	1 134	F.5	Equity and investment fund shares or
	363		- 2	365	252		- 8	120	F.6	Insurance, pension and standardised guarantee schemes
	861		1	860	- 24	- 23	646	261	F.7	Financial derivatives and employee stock
			- 402	6 075	- 554	- 1 937	6 260	2 306	F.8	Other accounts receivable/payable
									B.9 F	Net lending (+) /borrowing (-) Statistical discrepancy

Sources: Statistics Portugal (*INE*); Portuguese Central Bank (*Banco de Portugal*)

A.1. (continued) **Integrated Economic Accounts Table of Portugal in 2013**

(Unit: millions of euros)

Code	Transactions and other flows, stocks and balancing items	S.11 Non-Financial Corporations	S.12 Financial Corporations	S.13 General Government	S.14 Households	S.15 NPISHs	S.1 Total of the Economy	S.2 Rest of the World Account	Goods and Services Account (Uses)	Total	Accounts
											Current accounts Resources
P.7	Imports of goods and services							65 573		65 573	I. Production / external account of goods and services
P.6	Exports of goods and services								67 284	67 284	
P.1	Output of goods and services	210 949	14 883	35 710	40 884	5 435	307 861			307 861	
P.2	Intermediate consumption								158 093	158 093	
D.21-D.31	Net taxes on products						20 501			20 501	
B.1g	Gross added value						149 768			149 768	II.1.1. Generation of income account
B.1*g	Gross domestic product						170 269			170 269	
P.51c	Consumption of fixed capital										
B.1n	Value added, net	63 968	7 177	21 007	25 257	2 476	119 884			119 884	
B.1*n	Net domestic product						140 385				
B.11	External balance of goods and services							- 1 711			
D.1	Compensation of employees				76 246		76 246	371		76 617	II.1.2. Allocation of primary income account
D.2-D.3	Net taxes on production and imports			22 288			22 288	- 1 752		20 536	
D.2	Taxes on Production and Imports			23 320			23 320	144		23 463	
D.21	Taxes on Products										
D.29	Other Taxes on Production										
D.3	Subsidies			- 1 031			- 1 031	- 1 896		- 2 928	
D.31	Subsidies on Products										
D.39	Other Subsidies on Production										
B.2g+B3g	Gross operating surplus and Gross mixed income	32 746	3 596	5 356	31 198	557	73 454			73 454	
B.2g	Gross operating surplus	32 746	3 596	5 356	12 078	557	54 333			54 333	
B.3g	Gross mixed income				19 120		19 120			19 120	
P.51c1	Consumption of fixed capital on gross operating surplus	14 266	859	5 092	7 267	557	28 041			28 041	
P.51c2	Consumption of fixed capital on gross mixed income				1 843		1 843			1 843	
B.2n	Net operating surplus	18 480	2 737	264	4 811		26 292			26 292	
B.3n	Net mixed income				17 277		17 277			17 277	
D.4	Property income	7 518	19 972	2 132	14 261	238	44 122	10 415		54 537	
B.5g	Gross national income/ Gross balance of primary incomes	22 486	5 667	21 505	117 544	773	167 975			167 975	II.2. Secondary distribution income account
B.5n	Net national income/ Net balance of primary incomes	8 220	4 807	16 413	108 435	216	138 090			138 090	
D.5	Current taxes on income, wealth, etc			19 411			19 411	277		19 688	
D.61	Social contributions	1 419	1 862	20 449	15	385	24 130	154		24 284	
D.62	Social benefits other than social transfers				34 715		34 715	240		34 955	
D.7	Other current transfers	498	3 372	2 479	7 977	2 325	16 652	4 605		21 256	
B.6g	Gross disposable income	17 316	4 522	27 702	117 203	3 065	169 808			169 808	II.3. Redistribution of income in kind
B.6n	Net disposable income	3 050	3 663	22 610	108 094	2 508	139 924			139 924	
D.63	Social transfers in kind				20 843		20 843			20 843	
B.7g	Gross adjusted disposable income	17 316	4 522	10 285	138 047	- 361	169 808			169 808	II.4. Use of income account
B.7n	Net adjusted disposable income	3 050	3 663	5 193	128 937	- 918	139 924			139 924	
B.6g	Gross disposable income	17 316	4 522	27 702	117 203	3 065	169 808			169 808	
B.6n	Net disposable income	3 050	3 663	22 610	108 094	2 508	139 924			139 924	
P.4	Actual Final Consumption								143 644	143 644	
P.3	Final consumption expenditure								143 644	143 644	
D.8	Adjustment for the change in the net				276		276			276	
B.8g	Gross saving										
B.8n	Net saving										
B.12	Current external balance										
											Changes in liabilities and net worth
B.8n	Net saving	3 050	3 386	- 9 891	653	- 918	- 3 720			- 3 720	III.1.1. Change in net worth due to saving and capital transfers
B.12	Current external balance							- 1 250			
D.9r	Capital transfers, receivable	1 213	1 001	1 948	483	339	4 983	217		5 201	
D.9p	Capital transfers, payable (-)	- 213	- 585	- 1 546	- 3	- 2	- 2 349	- 2 852		- 5 201	
B.10.1	Changes in net worth due to saving and capital transfers	4 050	3 802	- 9 489	1 132	- 581	- 1 086	- 3 885		- 4 970	III.1.2 Acquisitions of non-financial assets account
P.51g	Gross fixed capital formation										
P.51c	Consumption of fixed capital (-)										
P.52	Changes in inventories										
P.53	Acquisitions less disposals of valuables										
NP	Acquisitions less disposals of non-produced non-financial assets										
B.9	Net lending (+) /borrowing (-)										
		S.11	**S.12**	**S.13**	**S.14 + S.15**		**S.1**	**S.2**			
	Net acquisition of financial assets\										III.2 Financial account
	Net incurrence of liabilities	6 016	- 15 423	5 820	- 14 617		- 18 205	- 5 227		- 23 432	
F.1	Monetary gold and SDRs		0				0	- 1		- 1	
F.2	Currency and deposits		- 18 252	1 223			- 17 029	- 11 416		- 28 445	
F.3	Debt securities	3 824	- 7 718	- 2 927	0		- 6 821	- 2 924		- 9 744	
F.4	Loans	- 4 019	1 617	8 979	- 5 855		723	1 675		2 398	
F.5	Equity and investment fund shares or	3 544	- 4 013		0		- 469	5 932		5 464	
F.6	Insurance, pension and standardised guarantee schemes	89	243		62		395	- 32		363	
F.7	Financial derivatives and employee stock	- 163	- 6	18	0		- 151	1 012		861	
F.8	Other accounts receivable/payable	2 739	12 705	- 1 474	- 8 824		5 147	526		5 673	
B.9 F	Net lending (+) /borrowing (-)	3 740	3 479	- 8 245	6 200		5 173	- 5 173		0	
	Statistical discrepancy	*1 347*	*- 120*	*0*	*0*		*1 227*	*- 1 227*		*0*	

Sources: Statistics Portugal (*INE*); Portuguese Central Bank (*Banco de Portugal*)

A.2. Supply Table of Portugal in 2013 - level of disaggregation 1

(Unit: millions of euros)

Supply of goods and services (or products)	Output (P1)											Imports (P7)	Trade and transport margins	Taxes less subsidies on Products (D.21-D.31)	Total Supply at purchasers' price
	a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	total by product				
p01	7 556	3	0	13	0	0	0	0	14	0	7 586	3 285	3 128	95	14 094
p02	298	95 574	148	1 914	100	0	0	16	64	0	98 115	53 823	24 774	12 992	189 703
p03	17	393	17 816	240	44	0	355	21	178	19	19 083	119	0	489	19 691
p04	123	1 546	76	59 868	218	0	7	227	476	65	62 604	2 186	- 28 362	1 923	38 351
p05	0	9	0	528	10 904	98	0	99	142	1	11 782	1 325	459	1 013	14 578
p06	0	0	0	40	0	14 355	0	0	0	0	14 395	691	0	1 062	16 148
p07	0	3	84	105	10	672	19 309	3	353	11	20 550	7	0	9	20 566
p08	57	1 482	158	2 704	408	116	101	18 477	2 209	220	25 932	1 803	0	1 796	29 531
p09	0	39	1	30	1	100	2	2	40 416	2	40 595	130	0	26	40 751
p10	0	63	0	487	0	0	0	0	45	6 624	7 220	166	1	1 096	8 483
total by industry	8 052	99 113	18 284	65 929	11 684	15 340	19 774	18 845	43 897	6 943	307 861	63 535	0	20 501	391 897
Direct purchases abroad by residents	---	---	---	---	---	---	---	---	---	---	---	2 337	---	---	2 337
Cif/fob adjustments on imports	---	---	---	---	---	---	---	---	---	---	---	- 300	---	---	- 300
Total	8 052	99 113	18 284	65 929	11 684	15 340	19 774	18 845	43 897	6 943	307 861	65 573	0	20 501	393 935

Source: Statistics Portugal (*INE*)

Note: This table was constructed from the Supply and Use Table and the Production Matrix disclosed by INE

A.3. Use Table of Portugal in 2013 - level of disaggregation 1

(Unit: millions of euros)

Use of goods and services (or products)	Intermediate Consumption (P2)											Final Consumption (P3)				Gross Capital Formation (P5)				Exports (P6)	Total Use at purchasers' price
	a01	a02	a03	a04	a05	a06	a07	a08	a09	a10	total by product	Households (S14)	NPISH (S15)	Government (S13)	total	GFCF (P51g)	Changes in inventories (P52)	ADV (P53)	total		
p01	1 094	6 144	1	432	3	0	1	41	93	29	7 838	4 666	0	0	4 666	420	142	0	561	1 029	14 094
p02	2 655	57 648	4 811	11 183	1 150	197	423	1 126	4 933	677	84 804	50 256	0	1 469	51 725	7 039	- 294	47	6 792	46 383	189 703
p03	108	538	4 878	743	114	72	339	98	698	71	7 660	116	0	146	262	11 244	- 126	0	11 118	651	19 691
p04	200	2 716	200	6 920	214	202	36	575	1 701	224	12 988	17 826	1	897	18 724	22	0	0	22	6 617	38 351
p05	52	624	88	914	2 431	664	43	1 188	744	177	6 925	4 189	15	158	4 362	2 094	- 3	0	2 091	1 201	14 578
p06	142	1 427	691	1 896	137	4 080	- 169	1 026	506	115	9 850	5 658	0	130	5 788	0	0	0	0	509	16 148
p07	6	458	105	1 180	171	367	184	169	401	80	3 120	16 144	0	20	16 164	1 273	0	0	1 273	9	20 566
p08	215	3 958	713	5 669	1 989	1 353	327	4 336	2 665	784	22 009	1 778	68	189	2 034	3 002	- 9	0	2 994	2 493	29 531
p09	11	83	22	109	129	55	7	87	1 049	28	1 579	7 492	2 388	29 183	39 063	0	0	0	0	109	40 751
p10	26	117	24	171	130	94	10	80	197	470	1 320	5 711	955	308	6 973	29	0	35	64	127	8 483
total by industry	4 510	73 714	11 533	29 216	6 467	7 085	1 200	8 726	12 987	2 654	158 093	113 836	3 426	32 501	149 763	25 122	- 289	81	24 914	59 128	391 897
Direct purchases abroad by residents (+)	---	---	---	---	---	---	---	---	---	---	---	2 337	---	---	2 337	---	---	---	---	---	2 337
Purchases on the domestic territory by non-residents (-)	---	---	---	---	---	---	---	---	---	---	---	- 8 456	---	---	- 8 456	---	---	---	---	8 456	0
Cif/fob adjustments on imports	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	- 300	- 300
Total	4 510	73 714	11 533	29 216	6 467	7 085	1 200	8 726	12 987	2 654	158 093	107 717	3 426	32 501	143 644	25 122	- 289	81	24 914	67 284	393 935
Gross Added Value (GDP)	3 542	25 399	6 751	36 713	5 217	8 255	18 573	10 119	30 910	4 288	149 768										
Compensation of Employees (D1)	924	12 252	4 161	17 398	2 603	4 102	418	6 727	24 702	2 993	76 280										
Other taxes less subsidies on production (D29-D39)	- 720	299	70	415	76	340	802	88	- 960	- 377	35										
Gross Operating Surplus and Gross Mixed Income	3 338	12 848	2 520	18 900	2 538	3 813	17 353	3 304	7 167	1 672	73 454										
Total Output (P1)	8 052	99 113	18 284	65 929	11 684	15 340	19 774	18 845	43 897	6 943	307 861										

Source: Statistics Portugal (*INE*)

Note: This table was constructed from the Supply and Use Table disclosed by INE.

A.4. Accounting multipliers for Portugal in 2013 - level of disaggregation 1

A.4.1. SAM by endogenous and exogenous accounts

(Unit: millions of euros)

		Endogenous							Exogenous								
		fl	fo	dich	dicnfc	dicfc	dicg	dicnpi	a01	a02	a03	a04	a05	a06	a07	a08	a09
Endogenous	fl	0	0	0	0	0	0	0	924	12 252	4 161	17 398	2 603	4 102	418	6 727	24 702
	fo	0	0	0	0	0	0	0	3 338	12 848	2 520	18 900	2 538	3 813	17 353	3 304	7 167
	dich	76 246	41 299	1 614	1 419	3 091	31 536	314	0	0	0	0	0	0	0	0	0
	dicnfc	0	22 486	1 419	0	397	82	0	0	0	0	0	0	0	0	0	0
	dicfc	0	5 667	2 849	663	1 127	36	27	0	0	0	0	0	0	0	0	0
	dicg	0	- 784	34 998	4 726	1 146	23	22	- 34 651	14 401	3 385	19 985	3 665	16 369	38 596	4 256	- 46 190
	dicnpi	0	773	709	147	56	1 661	13	0	0	0	0	0	0	0	0	0
Exogenous	a01	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a03	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a08	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	a10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	p01	0	0	4 666	0	0	0	0	1 094	6 144	1	432	3	0	1	41	93
	p02	0	0	50 256	0	0	1 469	0	2 655	57 648	4 811	11 183	1 150	197	423	1 126	4 933
	p03	0	0	116	0	0	146	0	108	538	4 878	743	114	72	339	98	698
	p04	0	0	11 707	0	0	897	1	200	2 716	200	6 920	214	202	36	575	1 701
	p05	0	0	4 189	0	0	158	15	52	624	88	914	2 431	664	43	1 188	744
	p06	0	0	5 658	0	0	130	0	142	1 427	691	1 896	137	4 080	- 169	1 026	506
	p07	0	0	16 144	0	0	20	0	6	458	105	1 180	171	367	184	169	401
	p08	0	0	1 778	0	0	189	68	215	3 958	713	5 669	1 989	1 353	327	4 336	2 665
	p09	0	0	7 492	0	0	29 183	2 388	11	83	22	109	129	55	7	87	1 049
	p10	0	0	5 711	0	0	308	955	26	117	24	171	130	94	10	80	197
	dikh	0	0	9 763	0	0	0	0	0	0	0	0	0	0	0	0	0
	diknfc	0	0	0	17 316	0	0	0	0	0	0	0	0	0	0	0	0
	dikfc	0	0	0	0	4 246	0	0	0	0	0	0	0	0	0	0	0
	dikg	0	0	0	0	0	- 4 799	0	0	0	0	0	0	0	0	0	0
	diknpi	0	0	0	0	0	0	- 361	0	0	0	0	0	0	0	0	0
	dif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	rw	371	10 415	1 460	133	838	2 803	42	33 931	- 14 101	- 3 315	- 19 570	- 3 588	- 16 029	- 37 794	- 4 168	45 230
total		76 617	79 856	160 528	24 404	10 900	63 844	3 482	8 052	99 113	18 284	65 929	11 684	15 340	19 774	18 845	43 897

Source: Table 7.

A.4.1. (continued) **SAM by endogenous and exogenous accounts**

(Unit: millions of euros)

		Exogenous																		total
		a10	p01	p02	p03	p04	p05	p06	p07	p08	p09	p10	dikh	diknfc	dikfc	dikg	diknpi	dif	rw	(yn;*yx*)
Endogenous	fl	2 993	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	337	76 617
	fo	1 672	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6 402	79 856
	dich	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5 010	160 528
	dicnfc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	24 403
	dicfc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	531	10 901
	dicg	- 18 134	95	13 059	492	1 932	1 018	1 068	9	1 805	26	1 102	0	0	0	0	0	0	1 425	63 844
	dicnpi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	124	3 482
Exogenous	a01	0	7 556	298	17	123	0	0	0	57	0	0	0	0	0	0	0	0	0	*8 052*
	a02	0	3	95 574	393	1 546	9	0	3	1 482	39	63	0	0	0	0	0	0	0	*99 113*
	a03	0	0	148	17 816	76	0	0	84	158	1	0	0	0	0	0	0	0	0	*18 284*
	a04	0	13	1 914	240	59 868	528	40	105	2 704	30	487	0	0	0	0	0	0	0	*65 929*
	a05	0	0	100	44	218	10 904	0	10	408	1	0	0	0	0	0	0	0	0	*11 684*
	a06	0	0	0	0	0	98	14 355	672	116	100	0	0	0	0	0	0	0	0	*15 340*
	a07	0	0	0	355	7	0	0	19 309	101	2	0	0	0	0	0	0	0	0	*19 774*
	a08	0	0	16	21	227	99	0	3	18 477	2	0	0	0	0	0	0	0	0	*18 845*
	a09	0	14	64	178	476	142	0	353	2 209	40 416	45	0	0	0	0	0	0	0	*43 897*
	a10	0	0	0	19	65	1	0	11	220	2	6 624	0	0	0	0	0	0	0	*6 943*
	p01	29	3 128	0	0	- 3 128	0	0	0	0	0	0	58	431	14	46	12	0	1 029	*14 094*
	p02	677	0	24 774	0	- 24 774	0	0	0	0	0	0	1 395	3 895	228	1 075	198	0	46 383	*189 703*
	p03	71	0	0	0	0	0	0	0	0	0	0	2 136	6 640	365	1 670	306	0	651	*19 691*
	p04	224	0	0	0	0	0	0	0	0	0	0	4	13	1	3	1	0	14 773	*40 388*
	p05	177	0	0	0	- 459	459	0	0	0	0	0	395	1 262	68	309	57	0	1 201	*14 578*
	p06	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	509	*16 148*
	p07	80	0	0	0	0	0	0	0	0	0	0	240	770	41	188	35	0	9	*20 566*
	p08	784	0	0	0	0	0	0	0	0	0	0	567	1 805	97	443	82	0	2 493	*29 531*
	p09	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109	*40 751*
	p10	470	0	0	0	- 1	0	0	0	0	0	1	25	23	1	8	7	0	127	*8 483*
	dikh	0	0	0	0	0	0	0	0	0	0	0	0	0	273	33	0	0	176	*10 245*
	diknfc	0	0	0	0	0	0	0	0	0	0	0	0	0	9	397	0	0	807	*18 529*
	dikfc	0	0	0	0	0	0	0	0	0	0	0	0	0	241	748	0	0	12	*5 247*
	dikg	0	0	0	0	0	0	0	0	0	0	0	3	160	45	0	2	0	1 737	*- 2 851*
	diknpi	0	0	0	0	0	0	0	0	0	0	0	0	0	17	203	0	0	120	*- 22*
	dif	0	0	0	0	0	0	0	0	0	0	0	6 921	2 393	3 599	- 8 245	- 721	- 7 804	- 10 400	*- 14 259*
	rw	17 758	3 285	53 756	117	4 213	1 319	685	7	1 793	130	161	- 1 499	1 138	248	270	0	- 6 455	0	*73 584*
total		6 943	14 094	189 703	19 691	40 388	14 578	16 148	20 566	29 531	40 751	8 483	10 245	18 529	5 247	- 2 851	- 22	- 14 259	73 584	

Source: Table 7.

A.4.2. Average expenditure propensities matrices

	fl	fo	dich	dicnfc	dicfc	dicg	dicnpi
$A_n = N *\hat{y}_n^{-1}$							
fl	0	0	0	0	0	0	0
fo	0	0	0	0	0	0	0
dich	0.995	0.517	0.010	0.058	0.284	0.494	0.090
dicnfc	0	0.282	0.009	0	0.036	0.001	0
dicfc	0	0.071	0.018	0.027	0.103	0.001	0.008
dicg	0	-0.010	0.218	0.194	0.105	0.000	0.006
dicnpi	0	0.010	0.004	0.006	0.005	0.026	0.004
$A_l = L *\hat{y}_n^{-1}$							
a01	0	0	0	0	0	0	0
a02	0	0	0	0	0	0	0
a03	0	0	0	0	0	0	0
a04	0	0	0	0	0	0	0
a05	0	0	0	0	0	0	0
a06	0	0	0	0	0	0	0
a07	0	0	0	0	0	0	0
a08	0	0	0	0	0	0	0
a09	0	0	0	0	0	0	0
a10	0	0	0	0	0	0	0
p01	0	0	0.029	0	0	0.000	0
p02	0	0	0.313	0	0	0.023	0
p03	0	0	0.001	0	0	0.002	0
p04	0	0	0.073	0	0	0.014	0.000
p05	0	0	0.026	0	0	0.002	0.004
p06	0	0	0.035	0	0	0.002	0
p07	0	0	0.101	0	0	0.000	0
p08	0	0	0.011	0	0	0.003	0.019
p09	0	0	0.047	0	0	0.457	0.686
p10	0	0	0.036	0	0	0.005	0.274
dikh	0	0	0.061	0	0	0	0
diknfc	0	0	0	0.710	0	0	0
dikfc	0	0	0	0	0.389	0	0
dikg	0	0	0	0	0	-0.075	0
diknpi	0	0	0	0	0	0	-0.104
dif	0	0	0	0	0	0	0
rw	0.005	0.130	0.009	0.005	0.077	0.044	0.012
Sum							
	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Source: Table A.4.1.

A.4.3. Accounting multipliers matrix

	fl	fo	dich	dicnfc	dicfc	dicg	dicnpi
fl	1.000	0.000	0.000	0.000	0.000	0.000	0.000
fo	0.000	1.000	0.000	0.000	0.000	0.000	0.000
dich	1.140	0.672	1.146	0.189	0.437	0.569	0.111
dicnfc	0.011	0.291	0.011	1.003	0.045	0.007	0.001
dicfc	0.023	0.102	0.023	0.034	1.126	0.012	0.011
dicg	0.253	0.204	0.255	0.239	0.223	1.127	0.032
dicnpi	0.012	0.020	0.012	0.013	0.014	0.032	1.005

Sources: Tables A.4.1. and A.4.2.

A.4.4. (Accounting multipliers for Portugal in 2013) Additional intragroup or direct effects matrix (M_1 - I)

	fl	fo	dich	dicnfc	dicfc	dicg	dicnpi
fl	0.000	0.000	0.000	0.000	0.000	0.000	0.000
fo	0.000	0.000	0.000	0.000	0.000	0.000	0.000
dich	0.000	0.000	0.010	0.000	0.000	0.000	0.000
dicnfc	0.000	0.000	0.000	0.000	0.000	0.000	0.000
dicfc	0.000	0.000	0.000	0.000	0.115	0.000	0.000
dicg	0.000	0.000	0.000	0.000	0.000	0.000	0.000
dicnpi	0.000	0.000	0.000	0.000	0.000	0.000	0.004

Sources: Tables A.4.1. and A.4.2.

A.4.5. (Accounting multipliers for Portugal in 2013) Additional intergroup or indirect effects matrix (M_2 - I). M_1

	fl	fo	dich	dicnfc	dicfc	dicg	dicnpi
fl	0.000	0.000	0.000	0.000	0.000	0.000	0.000
fo	0.000	0.000	0.000	0.000	0.000	0.000	0.000
dich	0.003	0.043	0.132	0.120	0.071	0.005	0.007
dicnfc	0.010	0.008	0.001	0.002	0.003	0.005	0.001
dicfc	0.023	0.021	0.001	0.002	0.009	0.011	0.002
dicg	0.248	0.201	0.005	0.019	0.088	0.124	0.024
dicnpi	0.005	0.005	0.007	0.006	0.005	0.003	0.001

Sources: Tables A.4.1. and A.4.2.

A.4.6. (Accounting multipliers for Portugal in 2013) Additional extragroup or cross effects matrix (M_3 - I). M_2. M_1

	fl	fo	dich	dicnfc	dicfc	dicg	dicnpi
fl	0.000	0.000	0.000	0.000	0.000	0.000	0.000
fo	0.000	0.000	0.000	0.000	0.000	0.000	0.000
dich	1.137	0.630	0.003	0.069	0.367	0.565	0.104
dicnfc	0.001	0.283	0.010	0.001	0.042	0.002	0.000
dicfc	0.001	0.080	0.023	0.033	0.002	0.001	0.009
dicg	0.005	0.003	0.249	0.221	0.134	0.003	0.008
dicnpi	0.007	0.015	0.005	0.007	0.008	0.029	0.001

Sources: Tables A.4.1. and A.4.2.