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A SAM (Social Accounting Matrix) approach to the Policy decision process

WP 28/2012/DE/UECE

WORKING PAPERS

ISSN Nº 0874-4548

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(July 2012)

Abstract

Policy analysis and policy making are parts of the policy decision process for which working tools are needed. A Social Accounting Matrix (SAM) consistent with the national accounts is presented at the level of a country, as a possible working tool intended to support that process.

Such a framework will therefore consist of a SAM-based approach. On the one hand, it will involve the presentation of a numerical version of a SAM, constructed from national accounts adapted to the System of National Accounts (SNA). This numerical version will be shown as a device that makes it possible to take a snapshot of the reality under study. On the other hand, it will also involve the presentation of two algebraic versions, with which alternative scenarios will be defined for the measurement of policy impacts. One version will consist of accounting multipliers, and the other version will be a so-called *master* model. In the latter each cell will be defined with a linear equation or system of equations, whose components will be all the known and quantified transactions of the SNA, using the parameters deduced from the numerical SAM that served as the basis for this model.

The national accounts will be adopted as the main source of information. The nominal flows that are representative of that part of a society's activity that is measured by these accounts will be used to measure the network of linkages and interactions involving institutional sectors, production activities and products, as well as the factors that are involved in the production process.

An application will be made of a SAM to the Portuguese case, with a comparison being made of the data obtained from the initial numerical SAM and the numerical versions replicated after running the SAM-based models that are representative of those two algebraic versions.

Certain comments will be made about those aspects that are either not measured at all or are poorly measured, or else are not identified, and these will be considered as limitations affecting the work

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* Base of the presentation to the 20th International Input-Output Conference, held in Bratislava - Slovakia, on 24-29/6/2012 and of the poster presented to the 32nd IARIW (International Association for Research in Income and Wealth) General Conference, Boston, USA, August 5-11, 2012.

The financial support provided by UTL FCT (*Fundação para a Ciência e a Tecnologia*) in Portugal is gratefully acknowledged. This paper is part of the Strategic Project for 2011-12 (PEst-OE/EGE/UI0436/2011).

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undertaken. Some guidelines will be defined for future research, designed to take the study of the SAM to a deeper level and to improve its use in establishing a suitable framework for explaining the reality of countries and supporting the policy decision process

Keywords: Social Accounting Matrix; SAM-based Modelling; Macroeconomic Modelling; Policy Analysis.

JEL Codes: E61; E10; D57.

Abbreviations[1]

AC – Accounting Multipliers

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

cif – cost-insurance-freight included

fob – free on board

GDP – Gross Domestic Product at market prices

ISWGNA – Inter-Secretariat Working Group on National Accounts

MM – *Master* Model

NPISH – Non-Profit Institutions Serving Households

n.e.c. - not elsewhere classified

SAM – Social Accounting Matrix

SNA – (United Nations) System of National Accounts

[1] Besides those listed in Appendix A.4.

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1. Introduction

This work revisits the contents of the study presented to the 18th International Input-Output Conference in 2010 (also published as a working paper: Santos, 2010). Based on one of the two experiments undertaken in that work, the purpose is of this paper is to reconsider what was done at that time, reanalyse the results, and clarify the analyses made and the conclusions drawn. At the same time, the systematisation and formalisation of the methodology used in the construction of the SAM in 2011 will also be revisited here (Santos, 2012 and 2011).

In Section 2, a description will be provided of the use that is made of the SAM in this study, together with a presentation of the methodology adopted. This will consist, on the one hand, of a numerical version of a SAM, constructed from national accounts adapted to the United Nations System of National Accounts (SNA), and, on the other hand, of two algebraic versions. The numerical version, presented in Section 2.1, will be shown as a device that provides a snapshot of the reality under study, while the two algebraic versions, presented in Section 2.2, will be shown as devices that permit the construction of alternative scenarios for the measurement of policy impacts.

Our attention will be focused on the institutional sectors; the distribution, redistribution and use of income; and social policies.

Through an application of the SAM to Portugal, Section 3 will provide a snapshot of the reality under study, based on the numerical SAM thus constructed, which will focus on three main aspects: domestic production; domestic demand; and income. This snapshot will then serve as the basis for the comparison of two scenarios showing the impacts of a 1% reduction in the rate of the direct taxes paid by households to the government. These scenarios will be based on numerical versions of SAMs that are replicated after running the SAM-based models representing the two algebraic versions referred to above.

In Section 4, some comments will be made about the aspects that are either not measured at all, are poorly measured, or else are not identified, and these will be considered as limitations affecting the work undertaken. Some indications will be provided about the places where some of these aspects should fit into the SAM structure as it is defined here, and these will be used as guidelines for future work.

The concluding remarks presented in Section 5 offer a systematic summary of the main ideas of the other sections, seeking to identify the main aspects of the work that was undertaken in the course of the study and suggesting what needs to be done in continuing the study of the SAM-based approach and its use in defining a suitable framework for explaining the reality of a country's economy and supporting the policy decision process.

2. The SAM-based approach – description and methodology

Richard Stone and Graham Pyatt played a key role in the implementation of the SAM-based approach. Both worked on the conceptual details of that approach: the former worked more in numerical terms, within the framework of a system of national accounts, while the latter worked more in algebraic terms, mainly within the scope of input-output analysis. Their work has been decisive for understanding the importance of the SAM as a measurement tool.

In the foreword to the book that can now be regarded as a pioneering work in terms of the SAM-based approach, "Social Accounting for Development Planning with special reference to Sri Lanka", Richard Stone stated that the framework of the system of national accounts can be rearranged and "the entries in a set of accounts can be presented in a matrix in which, by convention (…), incomings are shown in the rows and outgoings are shown in the columns; and in which, reflecting the fact that accounts balance, each row sum is equal to the corresponding column sum." That matrix, with an equal number of rows and columns, is the SAM, in the construction of which "it may be possible to adopt a hierarchical approach, first adjusting the entries in a summary set of national accounts and then adjusting subsets of estimates to these controlling totals." (Pyatt and Roe, 1977: xix, xxiii).

In turn, in the abstract to his article, "A SAM approach to modeling", Graham Pyatt says: "Given that there is an accounting system corresponding to every economic model, it is useful to make the accounts explicit in the form of a SAM. Such a matrix can be used as the framework for a consistent dataset and for the representation of theory in what is called its transaction form." In that transaction form (or TV (transaction value) form), the SAM can be seen ... "as a framework for theory" and its cells..."can be filled instead with algebraic expressions, which describe in conceptual terms how the corresponding transaction values might be determined". Thus, the SAM is used as "the basic framework for model presentation." (Pyatt, 1988: 327; 337).

Looking at the question from the perspectives outlined above, it can be said that a SAM can have two versions: a numerical version, which describes the activity of a society empirically; and an algebraic version, which describes that same activity theoretically. In the former version, each cell has a specific numerical value, with the sums of the rows being equal to the sums of the columns. In the latter version, each cell is filled with algebraic expressions that, together with those of all the other cells, form a SAM-based model, the calibration of which involves a replication of the numerical version.

In the words of Graham Pyatt, "the essence of (...) the SAM approach to modelling is to use the same SAM framework for both the empirical and the theoretical description of an economy." (Pyatt, 1988: 337).

In 1953, with the first and most fundamental contribution written by Richard Stone, the United Nations implemented the System of National Accounts (SNA), which continued to be published in successive versions until 2008 (ISWGA, 2008). This system establishes the rules for measuring the activity of countries or groups of countries, which, in turn, have been adopted and adapted to specific realities by the corresponding statistical offices.

2.1. The numerical version of the SAM

The latest versions of the SNA have devoted a number of paragraphs to discussing the question of SAMs. The 2008 version mentions SAMs in Section D of Chapter 28, entitled "Input-output and other matrix-based analysis" (ISWGA, 2008: 519-522), in which a matrix representation is presented of the accounts identified and described in the whole SNA. This representation is not to be identified with the SAM presented in this paper, although they both cover practically all the transactions recorded by those accounts. The SAM that will be presented below results from the work that the author has undertaken within a conceptual framework based on the works of Graham Pyatt and his associates (Pyatt, 1988 and 1991; Pyatt and Roe, 1977; Pyatt and Round, 1985) and from the efforts made to reconcile that framework with what has been defined by (the successive versions of) the SNA (Pyatt, 1985 and 1991a; Round, 2003; Santos, 2009). Thus, the author will propose a version of the SAM that, as will be seen, is representative of practically all the nominal flows measured by the SNA.

Working within the framework of the European System of National and Regional Accounts in the European Community of 1995 (the adaptation for Europe of the 1993 version of the SNA), Santos (2007) makes an application to Portugal at an aggregate level, explaining the main differences between the two matrices mentioned above – the matrix representation of the SNA accounts and the author's own version of the SAM. Pyatt (1999) and Round (2003) also approach this same issue with their own versions. Because the general differences between the accounts identified and described in the 1993 and 2008 versions of the SNA are not significant, these analyses still remains valid.

Thus, following on from what was said above, a square matrix will be worked upon, in which the sum of the rows is equal to the corresponding sum of the columns. In keeping with what is conventionally accepted, resources, incomes, receipts or changes in liabilities and net worth will be

represented in the entries made in the rows, while uses, outlays, expenditures or changes in assets will be represented in the entries made in the columns. Each transaction will therefore be recorded only once, in a cell of its own.

The starting point for the construction of a numerical SAM should be its design, i.e. the classification of its accounts, which will depend on the purposes for which it is to be used. By adopting the SNA as the underlying base source of information, a basic structure is proposed and the consistency of the whole system is highlighted. The flexibility of that basic structure will be shown, together with the possibilities that it presents for characterising any problem and for achieving the purposes of any study.

Adopting the working method recommended by Richard Stone in the second paragraph of Section 2 of this paper, the basic structure for the SAM presented here will be a summary set of the national accounts and the controlling totals for the other levels of disaggregation. Thus, in keeping with the conventions and nomenclature defined by the SNA, besides a rest of the world account, the proposed SAM will also include both production and trade accounts and institutional accounts.

Table 1 shows the above-mentioned basic structure, representing nominal transactions ("t") with which two indexes are associated. The location of these transactions in the matrix framework is described by those indexes, the first of which represents the row account and the second the column account. Each cell of this matrix will be converted into a submatrix, with the number of rows and columns corresponding to the level of disaggregation of the row and column accounts.

Table 1. The basic SAM

	p	*a*	f	dic	dik	dif	rw	Total
p – products	$t_{p,p}$	$t_{p,a}$	0	$t_{p,dic}$	$t_{p,dik}$	0	$t_{p,rw}$	$t_{p.}$
a – activities	$t_{a,p}$	0	0	0	0	0	0	$t_{a.}$
f – factors	0	$t_{f,a}$	0	0	0	0	$t_{f,rw}$	$t_{f.}$
dic – (domestic) institutions' current account	$t_{dic,p}$	$t_{dic,a}$	$t_{dic,f}$	$t_{dic,dic}$	0	0	$t_{dic,rw}$	$t_{dic.}$
dik – (domestic) institutions' capital account	0	0	0	t_{dikdic}	$t_{dik,dik}$	$t_{dik,dif}$	$t_{dik,rw}$	$t_{dik.}$
dif – (domestic) institutions' financial account	0	0	0	0	0	$t_{dif,dif}$	$t_{dif,rw}$	$t_{dif.}$
rw – rest of the world	$t_{rw,p}$	$t_{rw,a}$	$t_{rw,f}$	$t_{rw,dic}$	$t_{rw,dik}$	$t_{rw,dif}$		$t_{rw.}$
Total	$t_{.p}$	$t_{.a}$	$t_{.f}$	$t_{.dic}$	$t_{.dik}$	$t_{.dif}$	$t_{.rw}$	

Sources: Santos (2010).

Note: The first three accounts (p = products, *a* = activities and f = factors (of production)) are the production and trade accounts of the economy and the next three accounts (dic = current; dik = capital; dif = financial) are the accounts of the (domestic) institutions. The last account (rw = rest of the world) represents the "outside" part of the (domestic) economy.

Taking into account the basic structure of the SAM, and in order to form a first general idea of the network of linkages between its different accounts, Outline 1 shows the nominal transactions or flows ("t"), with the arrows illustrating the direction of the payments made from the (column) account that pays to the (row) account that receives. Table 2 describes these flows.

Table 2. The National Accounts transactions in the cells of the basic SAM

SAM			National Accounts transactions	
row	column	Description (valuation[2])	(SNA) code	Description (valuation[2])
p	p	trade and transport margins	---	trade and transport margins
a	p	production (basic prices)	P1	output (basic prices)
dic	p	net taxes on products (paid to domestic institutions – general government)	D21-D31	taxes on products *minus* subsidies on products
rw	p	net taxes on products (paid to the RW), when these exist		
		imports (cif prices)	P7	imports of goods and services (cif prices)
p	rw	exports (fob prices)	P6	exports of goods and services (fob prices)
p	*a*	intermediate consumption (purchasers' prices)	P2	intermediate consumption (purchasers' prices)
p	dic	final consumption (purchasers' prices)	P3	final consumption expenditure (purchasers' prices)
p	dik	gross capital formation (purchasers' prices)	P5	gross capital formation (purchasers' prices)
f	*a*	gross added value (factor cost)	D1	compensation of employees
			D4	net property income
			B2g	gross operating surplus
			B3g	gross mixed income

[2] In the transactions represented by the cells whose rows and/or columns represent production accounts, as well as in the aggregates and balances that can be calculated from these, as will be seen in Section 3, the following types of valuation are identified (regardless of whether one is working with current or constant (price) values): factor cost; basic, cif (cost-insurance-freight included) and fob (free on board) prices; purchasers' or market prices.

Factor cost represents the compensation of the factors (or the primary incomes due to labour and capital) used in the production process of the domestic economy, excluding taxes on production and imports (taxes on products and other taxes on production) and subsidies (subsidies on products and other subsidies on production). This type of valuation is considered in the SNA (Paragraph 265) to be complementary (ISWGNA, 2008: 22).

When other taxes on production, net of other subsidies on production, are added to the production value of the domestic economy at factor cost, we obtain the basic prices for the production that will be transacted in the domestic market and the fob price level of the part that will be exported. Imports, valued at cif prices, will be added at this level to the unexported part of domestic production to be transacted in the domestic market.

Purchasers' or market prices relate to those products, either domestically produced or imported, that are transacted in the domestic market. Here, the basic/cif prices will be increased by adding to them the trade and transport margins and the taxes net of subsidies on products.

SAM			National Accounts transactions	
row	column	Description (valuation[2])	(SNA) code	Description (valuation[2])
dic	*a*	net taxes on production (paid to domestic institutions - general government)	D29--D39	other taxes on production *minus* other subsidies on production
rw	*a*	net taxes on production (paid to the RW), when these exist		
dic	f	gross national income	B5g	gross national income
rw	f	compensation of factors to the RW	D1	primary income paid to/received from the rest of the world
f	rw	compensation of factors from the RW	D4	compensation of employees net property income
dic	dic	current transfers within domestic institutions	D5	current taxes on income, wealth, etc.
rw	dic	current transfers to the RW	D6	social contributions and benefits
dic	rw	current transfers from the RW	D7	other current transfers
			D8	adjustment for the change in the net equity of households in pension fund reserves
dik	dic	gross saving	B8g	gross saving
dik	dik	capital transfers within domestic institutions	D9	capital transfers
dik	rw	capital transfers from the RW		
rw	dik	capital transfers to the RW		
dik	dif	- net lending/borrowing[3]	B9	net lending/borrowing
dif	dif	financial transactions within domestic institutions	F1 F2 F3 F4 F5 F6 F7	monetary gold and special drawing rights (SDRs) currency and deposits securities other than shares loans shares and other equity insurance technical reserves other accounts receivable/payable
rw	dif	financial transactions to the RW		
dif	rw	financial transactions from the RW		
p	total	aggregate demand	row sum of the p account's cells (see above)	

[3] In the National Accounts, the net lending (+) or borrowing (-) of the total economy is the sum of the net lending or borrowing of the institutional sectors. This represents the net resources that the total economy makes available to the rest of the world (if it is positive) or receives from the rest of the world (if it is negative). The net lending (+) or borrowing (-) of the total economy is equal (but with an opposite mathematical sign) to the net borrowing (-) or lending (+) of the rest of the world.
In the SAM's capital account, this is considered as a component of investment funds, required/not required to cover aggregate investment. In other words, it is the financing requirement/capacity of the economy that will be covered/absorbed by financial transactions (from/to the rest of the world, since the national funds are not enough/in excess). Therefore, if there is net borrowing, we have a financing requirement that is covered by financial transactions, i.e. a resource of the capital account (row) and a use of the financial account (column). If there is net lending, we have a financing capacity that will be absorbed by financial transactions, i.e. a resource of the financial account (row) and a use of the capital account (column).

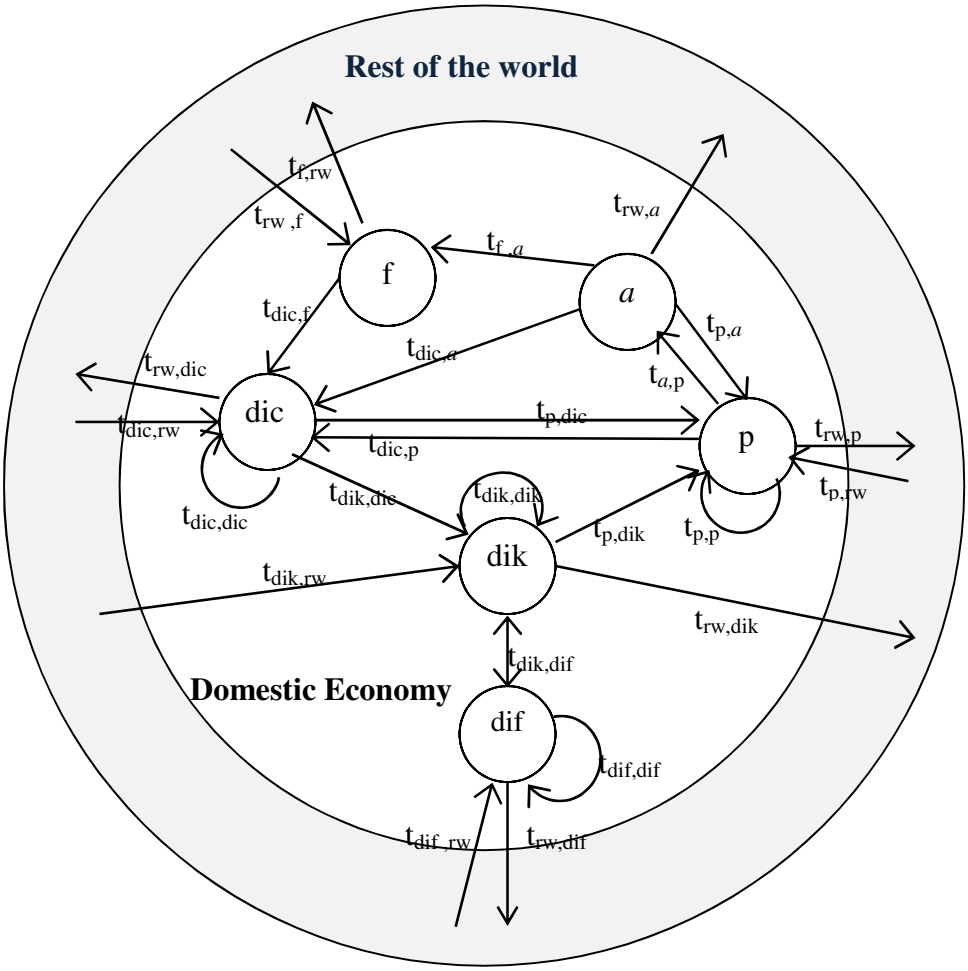
SAM			National Accounts transactions	
row	column	Description (valuation[2])	(SNA) code	Description (valuation[2])
total	p	aggregate supply	column sum of the p account's cells (see above)	
a	total	production value	P1	output (basic prices)
total	*a*	total costs	column sum of the *a* account's cells (see above)	
f	total	aggregate factors income	row sum of the f account's cells (see above)	
total	f		column sum of the f account's cells (see above)	
dic	total	aggregate income	row sum of the dic account's cells (see above)	
total	dic		column sum of the dic account's cells (see above)	
dik	total	investment funds	row sum of the dik account's cells (see above)	
total	dik	aggregate investment	column sum of the dik account's cells (see above)	
dif	total	total financial transactions	row sum of the dif account's cells (see above)	
total	dif		column sum of the dif account's cells (see above)	
rw	total	value of transactions to the rest of the world	row sum of the rw account's cells (see above)	
total	rw	value of transactions from the rest of the world	column sum of the rw account's cells (see above)	

Source: Santos (2012).

The integrated economic accounts table is equivalent to a summary of everything that is measured by the SNA. According to paragraph 2.75 of the 2008 SNA, "The integrated economic accounts use (…) three of the conceptual elements of the SNA (...) [institutional units and sectors, transactions and assets and liabilities] together with the concept of the rest of the world to form a wide range of accounts. These include the full sequence of accounts for institutional sectors, separately or collectively, the rest of the world and the total economy." (ISWGNA, 2008: 23). The table in Appendix A.5 illustrates this situation for Portugal in 2005. Based on that table, and in view of the previous description, it can be said that all the transactions recorded by the national accounts are considered in the cells of the SAM.

Therefore, as mentioned above and again using the words of Richard Stone, the basic SAM that has just been described is the most aggregate "summary set of national accounts" and can represent a first level of the intended hierarchical method (approach), with all the controlling totals for the next level of that hierarchy.

Outline 1: The nominal flows between the basic SAM accounts



Source: Santos (2006)

Some other levels of that method can be identified within the national accounts, providing other controlling totals for greater levels of disaggregation – with or without national accounts.

Possible disaggregations and extensions are described, such as, for instance, the ones presented in Santos, 2012, while the results of an application made of a SAM to the case of Portugal in 2005 are presented in Section 3 (see the basic Portuguese SAM in Table A.1, of the Appendix).

Details about the sources of information and methodologies used in the construction of the SAM can be found in Santos, 2009: 179-184. These are based on an identical SAM constructed for 1995, but with a greater level of disaggregation.

The classification adopted for the accounts in that application involved the level of disaggregation described below. The case of the domestic economy, "Production and Trade" was divided into six groups of products and activities[4] and two factors of production – labour (employees) and own

[4] Respectively: group P6 of the "Classification of Products by Activity (CPA)" – principal products of activities according to NACE Rev.1., and group A6 of the "New Statistical Nomenclature of the Economic Activities in the European Community (NACE)" Rev. 1. See the description of each group in Appendix A.4. (sets).

account labour and capital. In turn, "Institutions" were divided into current, capital and financial accounts, with the last of these being a totally aggregate figure (due to the lack of information on the "from whom to whom" transactions) while the others were divided into: households, non-financial corporations, financial corporations, general government and non-profit institutions serving households (NPISH). Besides these accounts, we also have an aggregate account for the "rest of the world" – see the (disaggregated) Portuguese SAM in the Table A.2, of the Appendix.

The system underlying the national accounts worked on for that numerical version was European System of National and Regional Accounts in the European Community of 1995 – ESA 95 (Eurostat, 1996), which is based on the 1993 version of the International United Nations System of National Accounts – SNA 93, prepared by the Inter-Secretariat Working Group and published by the United Nations Statistical Office (ISWGNA, 1993). Consequently, all the conventions and nomenclatures of that system have been adopted. As referred above, because the general differences between the accounts identified and described in the 1993 and 2008 versions of the SNA are not significant, the analyses of those results still remains valid.

2.2. The algebraic versions of the SAM

Using both of the versions described below, a static and comparative static analysis will be made within a framework in which prices are not separated from quantities, with changes being identified only at the level of values.

It will be assumed that there is excess capacity in the economy and that the production technology and resource endowment are given.

2.2.1. Accounting multipliers

The base methodology that is to be followed is centred upon the use of multipliers. A systematic outline of this methodology is provided below, following Santos (2004 and 2007a), in keeping with the work of Pyatt and Roe (1977) and Pyatt and Round (1985).

As shown in Table 3, we will have both exogenous and endogenous accounts, so that consequently the transactions in each cell of the SAM will be considered exogenous or endogenous according to the corresponding row and column accounts.

Table 3. The SAM in endogenous and exogenous accounts

	Endogenous		Exogenous		Total
		Σ		Σ	
Endogenous	N	n	X	x	y_n
Exogenous	L	l	R	r	y_x
Total	y_n'		y_x'		

Source: Pyatt and Round (1985).

Note: As referred above, rows represent resources, incomes, receipts or changes in liabilities and net worth and columns represent uses, outlays, expenditures or changes in assets.

Key:

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

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

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

R = matrix of transactions 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 3, it can be written 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 "l" is:

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

In the structure of Table 3, 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 written 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 have the equation that gives 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 (non 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 written 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)

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

The results of an application of a SAM to Portugal in 2005 are presented in Section 3. In that application, a scenario (AC) was studied that considered a reduction in the rate of the direct taxes paid by households to the government. Since this involved a flow from the households to the government, the (current and capital) accounts of the households were set as exogenous, as were the financial and the rest of the world accounts. After this, the accounting multipliers were calculated (see the A_n and M_a matrices, respectively, in Tables A.3.1 and A.3.2, of the Appendix). Based on a 1% reduction in the rate of the direct taxes paid by households to the government, a "new" x vector was calculated, after the X matrix had been recalculated with the new amount of the SAM cell (18, 15) of Table A.2. From equation (7), a "new" y_n vector was determined. The rest of the "new" SAM was calculated considering equations (5) and (10). Based on that "new" SAM, it was possible to carry out the analysis shown in Section 3.

2.2.2. The *master* model

This model, initially known by the name of "linear model", was first developed by the author in Santos (2008) and Santos (2009). The two models presented in these papers had the same basic structure, but a few more details were to be found in the latter study, linked to a more disaggregated numerical version. It was not possible to show these models here, due to the unavailability of data for the year that was worked upon.

As can be confirmed by comparing the structure of this model with the structure of the underlying database, or numerical version, presented in Section 2.1, all the transactions of the national accounts are identified, although a significant part are still considered as exogenous. Parameters were calculated from the data used for the construction of the numerical versions, from which the exogenous variables were also identified.

The GAMS (General Algebraic Modelling System) software was used to run this model – firstly to calibrate it and then to perform the application, which results will be studied in Section 3.

In this version of the model, it will be assumed that all domestically produced output is market output, and therefore any output produced for own final use and other non-market output will be considered as non-existent – the author hopes that this assumption can be eliminated in a future version of this model. On the other hand, since there is sufficient production capability available in the economy and imports are exogenous, domestic output will respond exclusively to aggregate demand.

Table 4. The formalized transactions (cells) in the basic SAM

	p	*a*	f	dic	dik	dif	rw	total
p – products	t_{pp}	t_{pa}	0	$t_{p\,dic}$	$t_{p\,dik}$	0	$t_{p\,rw}$	$t_{p.}$
a – activities	t_{ap}	0	0	0	0	0	0	$t_{a.}$
f – factors of production	0	t_{fa}	0	0	0	0	$t_{f\,rw}$	$t_{f.}$
dic – current account of the (domestic) institutions	$t_{dic\,p}$	$t_{dic\,a}$	$t_{dic\,f}$	$t_{dic\,dic}$	0	0	$t_{dic\,rw}$	$t_{dic.}$
dik – capital account of the (domestic) institutions	0	0	0	$t_{dik\,dic}$	$t_{dik\,dik}$	$t_{dik\,dif}$	$t_{dik\,rw}$	$t_{dik.}$
dif – financial account of the (domestic) institutions	0	0	0	0	0	$t_{dif\,dif}$	$t_{dif\,rw}$	$t_{dif.}$
rw – rest of the world	$t_{rw\,p}$	$t_{rw\,a}$	$t_{rw\,f}$	$t_{rw\,dic}$	$t_{rw\,dik}$	$t_{rw\,dif}$		$t_{rw.}$
total	$t_{.p}$	$t_{.a}$	t_{f}	$t_{.dic}$	$t_{.dik}$	$t_{.dif}$	$t_{.rw}$	

cell	**Equations** (or exogenous variables) See "conventions and declarations" in the Appendix (A.4.)	Eq.n°
Compensation of factors of production		
t_{fa}	**G**ross **A**dded **V**alue	
	$GAV_{f,a} = dbs_{f,a}*GAV_a$	(13)
	$GAV_a = \beta_a*VP_a$	(14)
	$GAV_f = \Sigma_a GAV_{f,a}$	(15)
$t_{f\,rw}$	**C**ompensation of **F**actors (**R**eceived) from the rest of the world	
	$CFR_{f,rw}$	---
$t_{dic\,f}$	**G**ross **N**ational **I**ncome	
	$GNI_{dic,f} = cf_{dic,f}*GNI_f$	(16)
	$GNI_f = GAV_f + CFR_{f,rw} - CFS_{rw,f}$	(17)
	$GNI_{dic} = \Sigma_f GNI_{dic,f}$	(18)
	$GNI = \Sigma_{dic} GNI_{dic}$	(19)
$t_{rw\,f}$	**C**ompensation of **F**actors (**S**ent) to the rest of the world	
	$CFS_{rw,f}$	---
Production		
t_{ap}	$VP_p = AD_p - TMT_p - NTP_p - IM_p$	(20)
	$VP_{a,p} = VP_p*\alpha_{a,p}$	(21)
	$VP_a = \Sigma_p VP_{a,p}$	(22)
External Trade		
$t_{p\,rw}$	**E**xports	
	$EX_{p,rw}$	---
$t_{rw\,p}$ (part)	**I**mports	
	$IM_{rw,p}$	---
Net indirect taxes or net taxes on production and imports		
Net **T**axes on Production (of **A**ctivities)		
$t_{dic\,a}$	$NTA_{dic,a} = ntag_{dic,a}*NTAA_a$	(23)

cell	**Equations** (or exogenous variables) See "conventions and declarations" in the Appendix (A.4.)	Eq.nº
	$NTA_{dic} = \Sigma_a NTA_{dic,a}$	(24)
	$NTA_a = \Sigma_{dic} NTA_{dic,a}$	(25)
t_{rwa}	$NTA_{rw,a} = ntarw_{rw,a} * NTAA_a$	(26)
	$NTA_{rw} = \Sigma_a NTA_{rw,a}$	(27)
	$NTA = \Sigma_{dic} NTA_{dic} + NTA_{rw}$	(28)
Net **T**axes on **P**roducts		
t_{dcp}	$NTP_{dic,p} = ntpg_{dic,p} * NTP_p$	(29)
	$NTP_{dic} = \Sigma_p NTP_{dic,p}$	(30)
t_{rwp} (part)	$NTP_{rw,p} = ntprw_{rw,p} * NTP_p$	(31)
	$NTP_{rw} = \Sigma_p NTP_{rw,p}$	(32)
	$NTP_p = tp_p * DT_p$	(33)
	$NTP = \Sigma_{dic} NTP_{dic} + NTP_{rw}$	(34)
Trade and Transport Margins		
t_{pp}	$TM_{p,p} = tmr_{p,p} * DT_p$	(35)
	$TMP_p = \sum_p TM_{p,p}$ (column sum)	(36)
Domestic Trade		
	$DTmp_p = VIC_p + FC_p + GCF_p$	(37)
	$DT_p = DTmp_p - TMP_p - NTP_p$	(38)
t_{pa}	(**V**alue of) **I**ntermediate **C**onsumption	
	$VIC_a = \gamma_a * VP_a$	(39)
	$VIC_{p,a} = icp_{p,a} * VIC_a$	(40)
	$VIC_p = \Sigma_a VIC_{p,a}$	(41)
	$VIC = \Sigma_p \Sigma_a VIC_{p,a}$	(42)
t_{pdc}	**F**inal **C**onsumption	
	$FC_{dic} = apc_{dic} * DI_{dic}$	(43)
	$FC_{p,dic} = fcs_{p,dic} * FC_{dic}$	(44)
t_{pdik}	**G**ross **C**apital **F**ormation	
	$GCF_{p,dik} = gfcf_{p,dik} * P51_{dik} + P52_p * chinv_{p,dik} + adv_{p,dik} * P53_{dik}$	(45)
	$GCF_{dik} = \Sigma_p GCF_{p,dik}$	(46)
	$P52_p = chinvc_p * AS_p$	(47)
	$P53_{dik} = advc_{dik} * S_{dik}$	(48)
Current Transfers		
t_{dcdic}	$CT_{dic,dic} = d5s_{dic,dic} * D5_{dic} + d61s_{dic,dic} * D61_{dic} + d62s_{dic,dic} * D62P_{dic} + d7_{dic,dic} * D7P_{dic} + D8_{dic,dic}$	(49)
	$D5_{dic} = ti_{dic} * AI_{dic}$	(50)
	$D61_{dic} = sc_{dic} * GNI_{dic}$	(51)
	$CTR_{dic} = \Sigma_{dic} CT_{dic,dic}$	(52)
	$CTP_{dic} = \Sigma_{dic} CT_{dic,dic}$	(53)
t_{dcrw}	$CT_{dic,rw} = D5RW_{dic,rw} + D61RW_{dic,rw} + D62RW_{dic,rw} + D7RW_{dic,rw}$	(54)
t_{rwdc}	$CT_{rw,dic} = d5rws_{rw,dic} * D5_{dic} + d61rws_{rw,dic} * D61_{dic} + d62rws_{rw,dic} * D62P_{dic} + d7rws_{rw,dic} * D7P_{dic}$	(55)
	$FC_{rw,dic} = fcsrw_{rw,dic} * FC_{dic}$	(56)

cell	**Equations** (or exogenous variables) See "conventions and declarations" in the Appendix (A.4.)	Eq.nº
Capital Transfers		
$t_{dik,ik}$	$KT_{dik,dik} = d91_{dik,dik}$ *$D91P_{dik}$ +$D92R_{dik}$*$d92_{dik,dik}$ + $D99R_{dik}$*$d99_{dik,dik}$	(57)
	$D91P_{dik} = tk_{dik}$ * $D99R_{dik}$	(58)
	$D92R_{dik} = cgfcf_{dik}$*$P51_{dik}$	(59)
	$KTR_{dik} = \Sigma_{dik} KT_{dik,dik}$	(60)
	$KTP_{dik} = \Sigma_{dik} KT_{dik,dik}$	(61)
$t_{dik,rw}$	$KT_{dik,rw} = D92R_{dik}$ *$d92rw_{dik,rw}$ + $D99R_{dik}$*$d99rw_{dik,rw}$	(62)
$t_{rw,dik}$	$KT_{rw,dik} = D92P_{rw,dik} + D99P_{rw,dik} + K2_{rw,dik}$	(63)
Gross Saving		
$t_{dik,dic}$	$S_{dik,dic} = si_{dik,dic}$*$S_{dic}$	(64)
	$S_{dik} = \Sigma_{dik} S_{dik,dic}$	(65)
	$S_{dic} = (1\text{-}apc_{dic})$ *DI_{dic}	(66)
	$S = \Sigma_{dic} S_{dic} = \Sigma_{dik} S_{dik}$	(67)
Financial Transactions		
$t_{dif,dif}$	FT_{dif}	---
$t_{dif,rw}$	$FTRW_{dif,rw} = FT_{rw,dif} + NLB_{dif}$	(68)
$t_{rw,dif}$	$FT_{rw,dif}$	---
Net borrowing/lending		
$t_{dik,dif}$	$NLB_{dik,dif} = AINV_{dik} - (S_{dik} + KTR_{dik} + KT_{dik,rw})$	(69)
	$NLB_{dif} = \Sigma_{dik} NLB_{dik,dif}$	(70)
Row totals		
$t_{p.}$	**A**ggregate **D**emand	
	$AD_p = VIC_p + FC_p + GCF_p + EX_{p,rw}$	(71)
$t_{a.}$	**P**roduction **V**alue	
	$VPT_a = \Sigma_p VP_{ap}$	(72)
$t_{f.}$	**A**ggregate **F**actors **I**ncome (**R**eceived)	
	$AFIR_f = GAV_f + CFR_{f,rw}$	(73)
$t_{dic.}$	**A**ggregate **I**ncome	
	$AI_{dic} = GNI_{dic} + NTA_{dic} + NTP_{dic} + CTR_{dic} + CT_{dic,rw}$	(74)
$t_{dik.}$	**Inv**estment **F**unds	
	$INVF_{dik} = S_{dik} + KTR_{dik} + NLB_{dik,dif} + KT_{dik,rw}$	(75)
$t_{dif.}$	**T**otal **F**inancial **T**ransactions (**R**eceived)	
	$TFTR_{dif} = FT_{dif,dif} + FTRW_{dif,rw}$	(76)
$t_{rw.}$	**V**alue of **T**ransactions to the **R**est of the **W**orld (**P**aid)	
	$TVRWP_{rw} = CFS_{rw,f} + \Sigma_a NTA_{rw,a} + \Sigma_p (NTP_{rw,p} + IM_{rw,p}) + \Sigma_{dic} (CT_{rw,dic} + FC_{rw,dic}) + \Sigma_{dik} KT_{rw,dik} + FT_{rw,dif}$	(77)
Column totals		
$t_{p.}$	**A**ggregate **S**upply	
	$AS_p = VP_p + TMT_p + NTP_p + IM_{rw,p}$	(78)
$t_{a.}$	**T**otal **C**osts	
	$VCT_a = GAV_a + VIC_a + NTA_a + NTA_{rw,a}$	(79)
$t_{f.}$	**A**ggregate **F**actors **I**ncome (**P**aid)	
	$AFIP_f = GNI_f + CFS_{rw,f}$	(80)

cell	**Equations** (or exogenous variables) See "conventions and declarations" in the Appendix (A.4.)	Eq.nº
t_{dic}	**A**ggregate **I**ncome	
	$AIP_{dic} = FC_{dic} + CTP_{dic} + S_{dic} + (CT_{rw,dic} + FC_{rw,dic})$	(81)
t_{dik}	**A**ggregate **I**nvestment	
	$AINV_{dik} = GCF_{dik} + KTP_{dik} + KT_{rw,dik}$	(82)
t_{dif}	**T**otal **F**inancial **T**ransactions (**P**aid)	
	$TFTP_{dif} = NLB_{dif} + FT_{dif,dif} + FT_{rw,dif}$	(83)
t_{rw}	**V**alue of **T**ransactions from the **R**est of the **W**orld (**R**eceived)	
	$TVRWR_{rw} = CFR_{f,rw} + \Sigma_p EX_{p,rw} + \Sigma_{dic} CT_{dic,rw} + \Sigma_{dik} KT_{dik,rw} + FTRW_{dif,rw}$	(84)

Sources: Santos (2008 and 2009)

As mentioned above, the results of the application of a SAM to Portugal in 2005 are presented in Section 3. In that application, a scenario (MM) was studied based on a 1% reduction in the rate of the direct taxes paid by households to the government. In this case, in equation (50), ti_{dich} was changed and the model was subsequently run, with a "new" SAM being calculated, from which it was possible to make the analysis shown in Section 3.

2.2.3. Accounting multipliers and the *master* model

Comparing the two described above SAM algebraic versions, besides the common assumptions referred to at the beginning of Section 2.2, the existence of many fixed parameters in the *master* model and fixed average expenditure propensities in the multipliers can be considered to be amongst its strongest and most limitative assumptions.

Special mention should be made of the financial transactions and of the transactions with the rest of the world: all of these are considered as exogenous in the accounting multipliers and almost all of them are considered as exogenous in the *master* model.

On the other hand, using the methodology of multipliers, shocks can only be performed on matrix X (transactions between exogenous and endogenous accounts - injections from first into second) and therefore the account of origin of the flow to be studied has to be set as exogenous. This means that, at the level of that account, all that can be measured is the direct influence of that shock. The global effect of the same shock on the destination is not considered. This does not happen with the *master* model, with which shocks can be performed using specific parameters (and exogenous variables) within specific SAM cells and not within SAM accounts. Therefore, more impacts can be measured with the *master* model.

3. From the snapshot of the reality under study to alternative scenarios for the measurement of the impact of socioeconomic policy. An application to Portugal.

The information given by the numerical version of the SAM will now be used to define the framework for explaining the reality under study. This numerical version will be the one described in Section 2.1, which represents the reality under study.

The numerical versions replicated after running the SAM-based models that are representative of the two algebraic versions presented in Section 2.2 – the accounting multipliers (AC) and the *master* model (MM) – will represent the two scenarios to be studied and compared with the reality under study.

In discussing our application of a SAM to Portugal in 2005, the former will be referred to as "Portugal-05" and the latter as "Scenario-AC" and "Scenario-MM". As has already been said, these two alternative scenarios represent the impacts of a policy measure consisting of a 1% reduction in the rate of the direct taxes paid by households to the government.

Although the modelling methodology adopted can be used to study structural changes, it does not, however, actually produce structural changes. Therefore, structural aspects will be presented in the analysis of the "real" SAM (Portugal-05) and will be used to explain some of the impacts in the constructed scenarios (Scenario-AC and Scenario-MM). As mentioned above, our attention will be focused on the institutional sectors and the corresponding distribution, redistribution and use of income. This will involve pursuing the stated aim of studying the SAM-based approach and its use in defining a suitable framework for explaining the socioeconomic reality of countries and supporting the policy decision process.

The following analysis will focus on three main aspects: domestic production, domestic demand and income. The snapshot made of the reality under study will involve the consideration of questions which the numerical SAM can answer. Thus, using the information provided by the application already mentioned, our analysis will be based on the specific parts of the SAM (Table A.2) compiled in tables whose titles are precisely those questions. Some of these tables are complemented by further information drawn from the integrated economic accounts (Table A.5), which is not found in this version of the SAM but is included in the author's research agenda, as mentioned in Section 4. To support the analysis of those Tables, charts were also constructed. Our exercise will involve a high level of aggregation, but, as mentioned in Section 2.1, greater disaggregation is possible, enabling us to answer the same type of questions (or even other questions) for specific disaggregations.

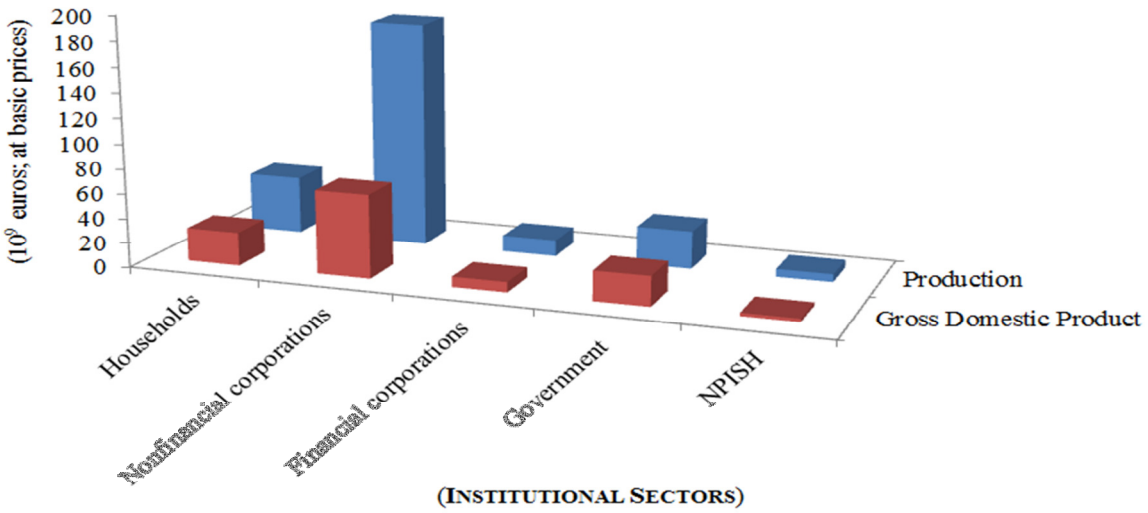
Table 5. "Portugal-05" Domestic Production: who produces?

	Production		Gross Domestic Product			
	at basic prices (*)				at factor cost (*)	
	10^6 euros	%	10^6 euros	%	10^6 euros	%
Institutions						
Households	46 508	17	26 661	21		
Nonfinancial corporations	180 752	65	66 946	52		
Financial corporations	12 856	5	8 221	6		
Government	30 278	11	23 962	19		
NPISH	6 282	2	2 573	2		
Total	276 675	100	128 363	100		
Activities						
Agriculture, hunting and foresty..	7 432	3	3 642	3	4 308	3
Industry, including energy	83 268	30	22 696	18	22 922	18
Construction	27 940	10	8 795	7	8 869	7
Wholesale and retail trade…	62 357	23	31 243	24	31 596	24
Financial, real-estate, renting ..	45 057	16	27 554	21	27 182	21
Other service activities	50 622	18	34 433	27	34 749	27
Total	276 675	100	128 363	100	129 626	100

Sources: Tables A.2 and A.5.

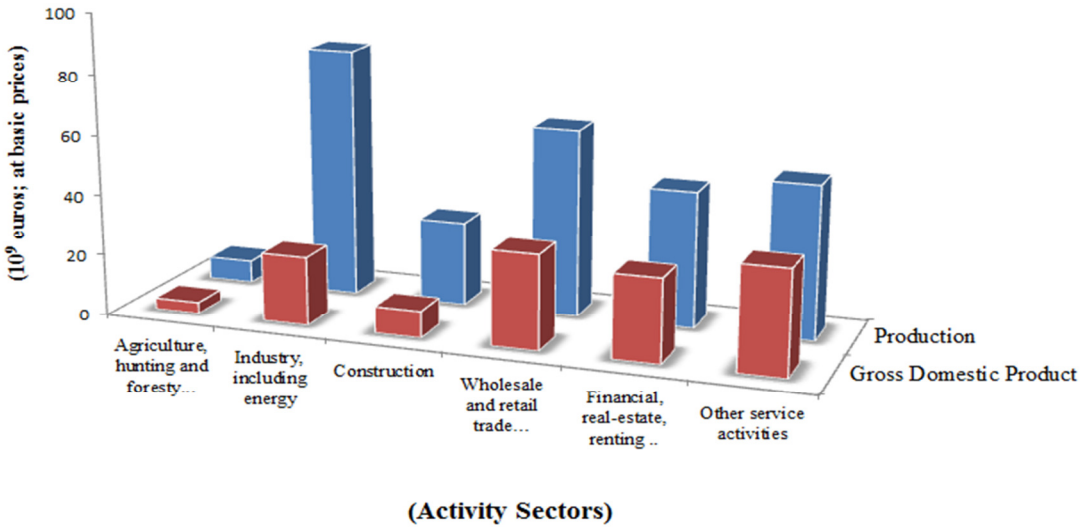
(*) See the specification of these two types of valuation in the footnote to Table 2.

Chart 1. "Portugal-05" Domestic Production by Institutional Sectors: who produces?



Source: Table 5

Chart 2. "Portugal-05" Domestic Production by Activity Sectors: who produces?



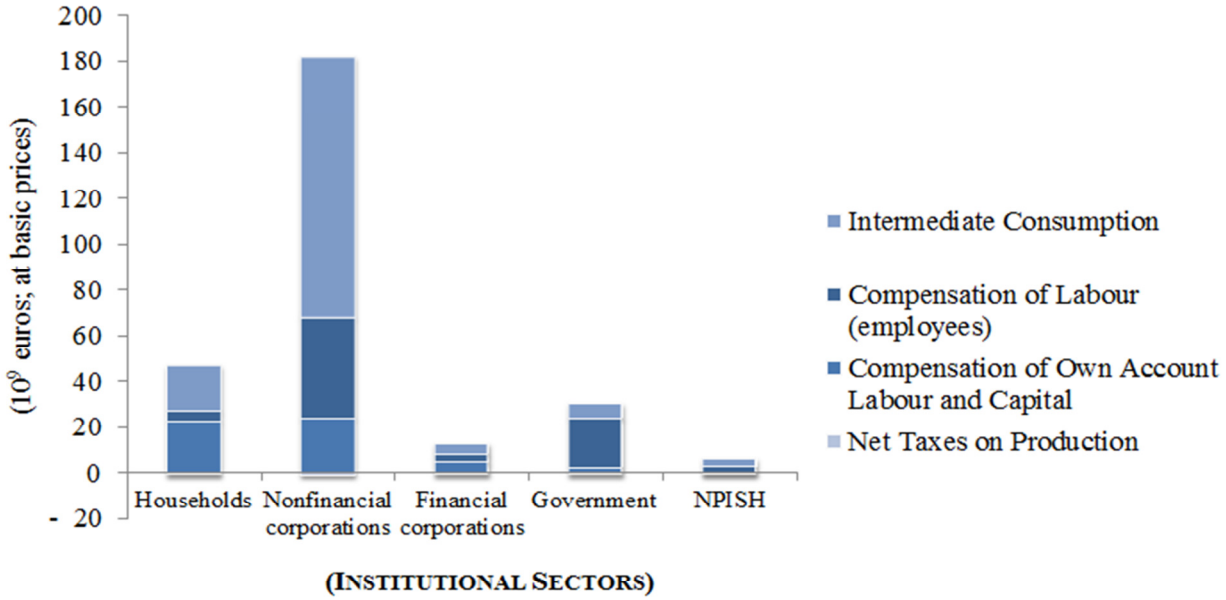
Source: Table 5

Table 6. "Portugal-05" Domestic Production: at what costs?

	Compensation of Factors of Production				Intermediate Consumption		Net Taxes on Production		Total Costs (at basic prices)	
	Labour (employees)		Own Account Labour and Capital							
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%
Institutions										
Households	4 297	9	22 589	49	19 847	43	- 225	0	46 508	100
Nonfinancial corporations	43 792	24	24 014	13	113 807	63	- 860	0	180 752	100
Financial corporations	3 642	28	4 583	36	4 635	36	- 4	0	12 856	100
Government	21 541	71	2 552	8	6 316	21	- 131	0	30 278	100
NPISH	2 086	33	529	8	3 708	59	- 42	-1	6 282	100
Total	75 358	27	54 267	20	148 312	54	- 1 263	0	276 675	100
Activities										
Agriculture, hunting and foresty..	826	11	3 482	47	3 790	51	- 666	-9	7 432	100
Industry, including energy	13 022	16	9 900	12	60 571	73	- 226	0	83 268	100
Construction	6 029	22	2 840	10	19 145	69	- 74	0	27 940	100
Wholesale and retail trade...	18 325	29	13 271	21	31 115	50	- 353	-1	62 357	100
Financial, real-estate, renting ..	8 830	20	18 352	41	17 503	39	372	1	45 057	100
Other service activities	28 327	56	6 422	13	16 189	32	- 316	-1	50 622	100
Total	75 358	27	54 267	20	148 312	54	- 1 263	0	276 675	100

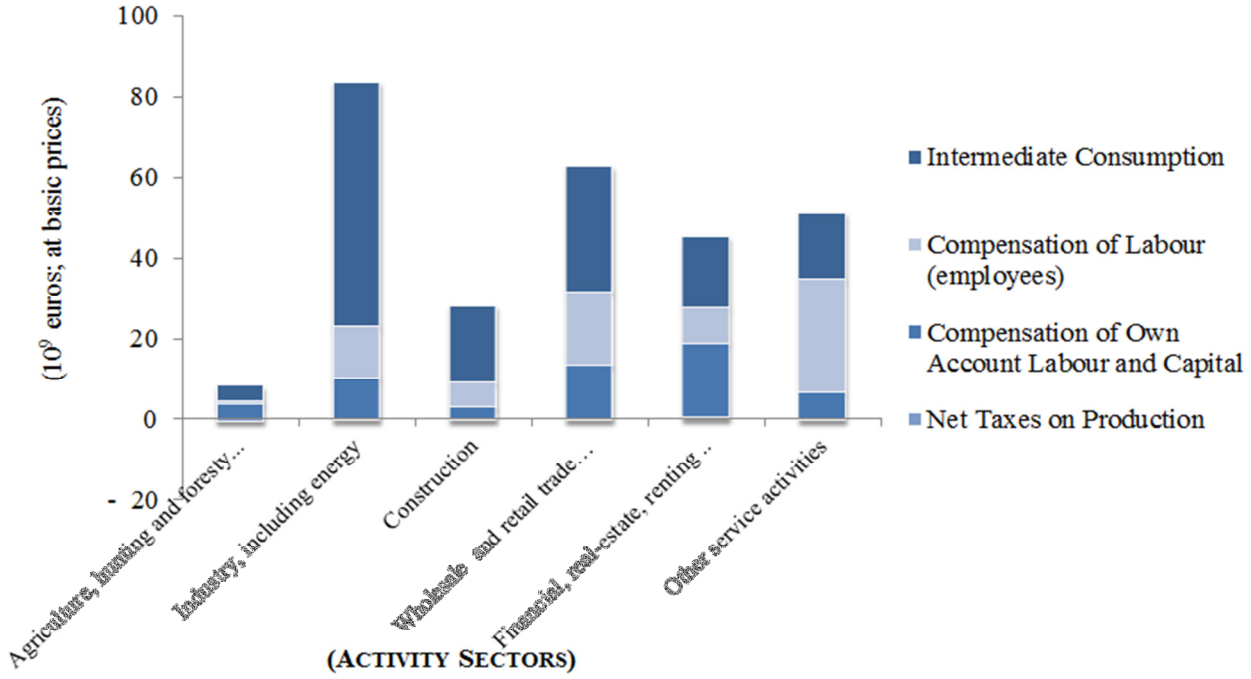
Sources: Tables A.2 and A.5.

Chart 3. "Portugal-05" Domestic Production by Institutional Sectors: at what costs?



Source: Table 6

Chart 4. "Portugal-05" Domestic Production by Activity Sectors: at what costs?



Source: Table 6

[See the parts relating to "institutions" in Tables 5 and 6 (and Charts 1 and 3)]

Non-financial corporations are responsible for 65% of domestic production and 52% of the gross domestic product (the difference between domestic production and intermediate consumption). Therefore, the cost structure of that institutional sector, namely the importance of intermediate consumption, contributes significantly towards the reduction of its relative importance in the economy as a whole, when we pass from domestic production to the gross domestic product. This does not happen either with the households or with the government – the two other institutional sectors that make an important contribution to domestic production and the gross domestic product. In fact, because these two institutional sectors do not require such high proportions of intermediate consumption in order to produce, their contribution to the gross domestic product (households: 21%; government: 19%) is greater than it is to domestic production (households: 17%; government: 11%). However, in order to produce, they incur higher costs in terms of the compensation of factors, namely: 49% of the compensation of own account labour and capital, in the case of households; 71% of the compensation of employees, in the case of the government – but this does not affect their relative shares of domestic production and the gross domestic product. These are aspects that cannot yet be seen in the structure of the SAM used in this paper, but which will become visible in the future, as a result of what will be mentioned in Section 4.

[See the parts relating to "activities" in Tables 5 and 6 (and Charts 2 and 4)]

Industry, including energy[5], is responsible for 30% of domestic production and for 18% of the gross domestic product. Thus, although this activity has the highest share of domestic production, due to the importance of intermediate consumption (73%) in the structure of its production costs, of the six sectors of activity into which the economy as a whole is organised, it is only the fourth most important activity in terms of its contribution to the gross domestic product. In turn, other service

[5] Activities included in this group: mining of metal ores; other mining and quarrying; manufacture of food products and beverages; manufacture of tobacco products; manufacture of textiles; manufacture of wearing apparel; dressing and dyeing of fur; tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear; manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials; manufacture of pulp, paper and paper products; publishing, printing and reproduction of recorded media; manufacture of coke, refined petroleum products and nuclear fuel; manufacture of chemicals and chemical products; manufacture of rubber and plastic products; manufacture of other non-metallic mineral products; manufacture of basic metals; manufacture of fabricated metal products, except machinery and equipment; manufacture of machinery and equipment n.e.c.; manufacture of office machinery and computers; manufacture of electrical machinery and apparatus n.e.c.; manufacture of radio, television and communication equipment and apparatus; manufacture of medical, precision and optical instruments, watches and clocks; manufacture of motor vehicles, trailers and semi-trailers; manufacture of other transport equipment; manufacture of furniture; manufacturing n.e.c.; recycling; electricity, gas, steam and hot water supply; collection, purification and distribution of water (Santos, 2009: 148-149). Activities that had no production in Portugal in 2005 are not mentioned.

activities[6] are responsible for only 18% of domestic production, but have the highest share in terms of the gross domestic product: 27%. The compensation of factors made the major contribution to the structure of production costs, most notably the compensation of employees. Wholesale and retail services, repair of motor vehicles and household goods, hotels and restaurants, transport and communications were in a similar situation to the other service activities.

The above analysis (supported by Tables 5 and 6 and the corresponding charts) was based on values at basic prices, i.e. including net taxes on production. However, the relative positions of the various activities are not significantly different if we consider the gross domestic product at factor cost (in Table 5).

Table 7. "Portugal-05" Domestic Production: what is produced?

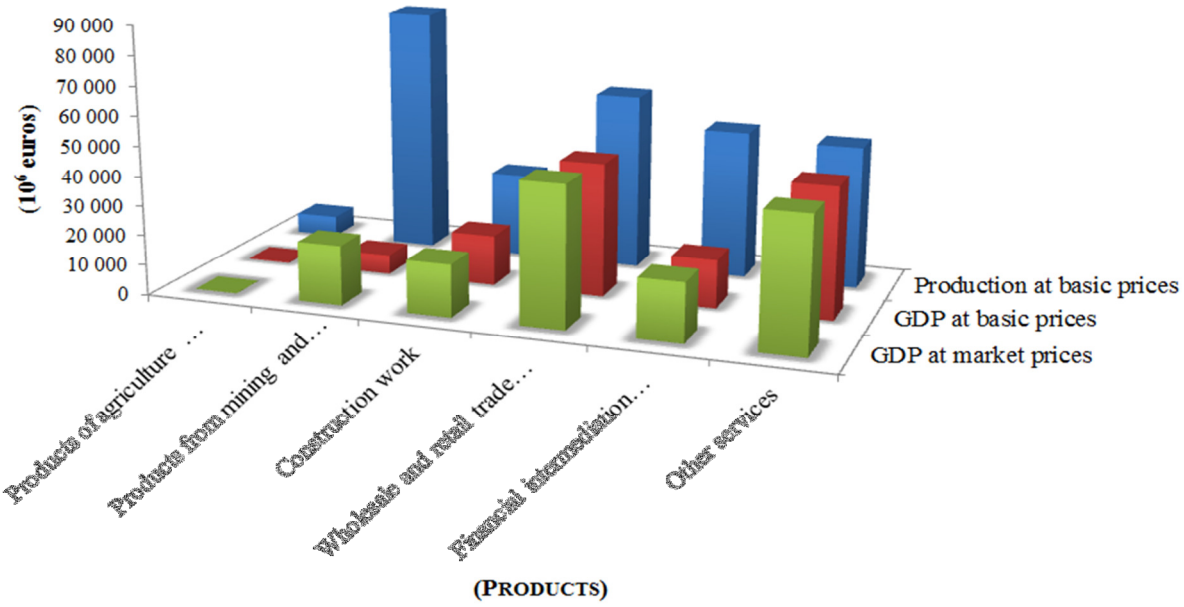
	Production		Gross Domestic Product			
	at basic prices(*)				at market prices(*)	
	10^6 euros	%	10^6 euros	%	10^6 euros	%
Products						
Products of agriculture …	6 955	3	288	0	73	0
Products from mining and …	83 747	30	6 477	5	19 933	13
Construction work	28 489	10	16 825	13	17 607	12
Wholesale and retail trade…	59 776	22	44 733	35	47 057	32
Financial intermediation…	49 888	18	16 173	13	19 745	13
Other services	47 821	17	43 867	34	44 707	30
Total	276 675	100	128 363	100	149 123	100

Source: Table A.2.

(*) See the specification of these two types of valuation in the footnote to Table 2.

[6] Activities included in this group: public administration and defence; compulsory social security; education; health and social work; sewage and refuse disposal, sanitation and similar activities; activities of membership organisations n.e.c.; recreation, cultural and sporting activities; other service activities; private households with employed persons (Santos, 2009: 148-149).

Chart 5. "Portugal-05" Domestic Production: what is produced?



Source: Table 7

[See Tables 7 and 5 and Charts 5 and 2]

Due to the way in which the products are organised and their underlying nomenclatures, a close relationship can be established between what is produced and the sectors of activity that produce these products. Thus, the products mainly produced by industry (including energy), i.e. the products from mining and quarrying, manufactured products and energy products[7], are the most representative group of the six considered, accounting for 30% of domestic production, and yet, at the same time, they are the least representative in terms of the gross domestic product (at basic prices), being responsible for only 5%. However, with the help of net taxes on products, this same group regains its importance, being responsible for 13% of the GDP (gross domestic product) at market prices. In turn, wholesale and retail trade services, repair services, hotel and restaurant

[7] Products included in this group: metal ores; other mining and quarrying products; food products and beverages; tobacco products; textiles; wearing apparel; furs; leather and leather products; wood and products of wood and cork (except furniture), articles of straw and plaiting materials; pulp, paper and paper products; printed matter and recorded media; coke, refined petroleum products and nuclear fuel; chemicals, chemical products and man-made fibers; rubber and plastic products; Other non-metallic mineral products; basic metals; fabricated metal products, except machinery and equipment; machinery and equipment n.e.c.; office machinery and computers; electrical machinery and apparatus n.e.c; radio, television and communication equipment and apparatus; medical, precision and optical instruments, watches and clocks; motor vehicles, trailers and semi-trailers; other transport equipment; furniture; other manufactured goods n.e.c.; recovered secondary raw materials; electrical energy, gas, steam and hot water; collected and purified water, distribution services of water (Santos, 2009: 146-147). Products that were not produced in Portugal in 2005 are not mentioned.

services, and transport and communication services[8], are the second most important group in terms of domestic production, with 22% of the total and occupy first position in terms of the gross domestic product at both basic prices and market prices, with 35% and 32% of the total, respectively.

Financial intermediation services, real estate, rental and business services[9] and other services, have almost similar shares in domestic production, with 18% and 17% of the total, respectively. However, the other services occupy second position in the gross domestic product at basic prices and at market prices, with 34% and 30% of the total, respectively, whereas financial intermediation services, real estate, rental and business services has a share of only 13%, in both cases.

Table 8. "Portugal-05" Domestic Production: what destination?

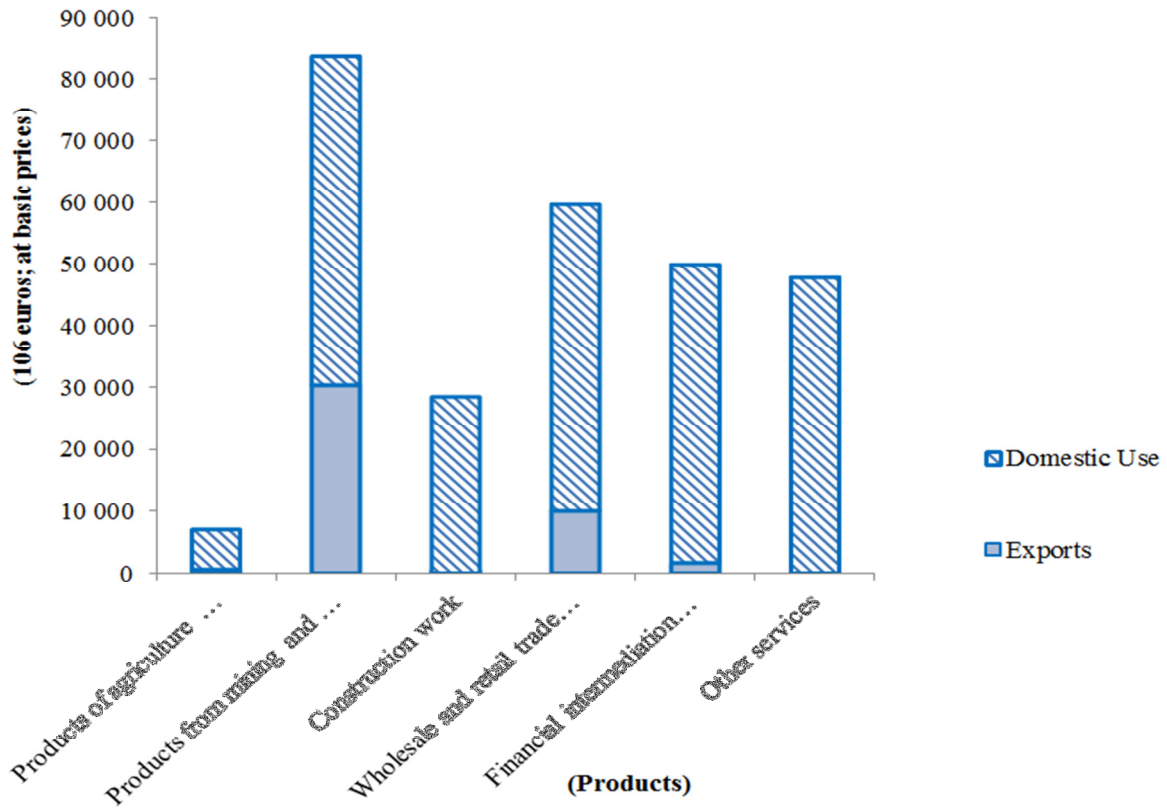
	Exports		Domestic Use		Production (at basic prices)	
	10^6 euros	%	10^6 euros	%	10^6 euros	%
Products						
Products of agriculture …	579	8	6 376	92	6 955	100
Products from mining and …	30 445	36	53 302	64	83 747	100
Construction work	0	0	28 489	100	28 489	100
Wholesale and retail trade…	9 820	16	49 955	84	59 776	100
Financial intermediation…	1 542	3	48 346	97	49 888	100
Other services	181	0	47 640	100	47 821	100
Total	42 567	15	234 108	85	276 675	100

Source: Table A.2.

[8] Products included in this group: trade, maintenance and repair services of motor vehicles and motorcycles; retail trade services of automotive fuel; wholesale trade and commission trade, except of motor vehicles and motorcycles; retail trade, except of motor vehicles and motorcycles; repair of personal and household goods; hotels and restaurants; land transport; transport via pipelines; water transport; air transport; supporting and auxiliary transport activities; activities of travel agencies; post and telecommunications (Santos, 2009: 146-147).

[9] Products included in this group: financial intermediation, except insurance and pension funding; insurance and pension funding, except compulsory social security; activities auxiliary to financial intermediation; real estate activities; renting of machinery and equipment without operator and of personal and household goods; computer and related activities; research and development; Other business activities (Santos, 2009: 146-147).

Chart 6. "Portugal-05" Domestic Production: what destination?



Source: Table 8

[See Table 8 and Chart 6]

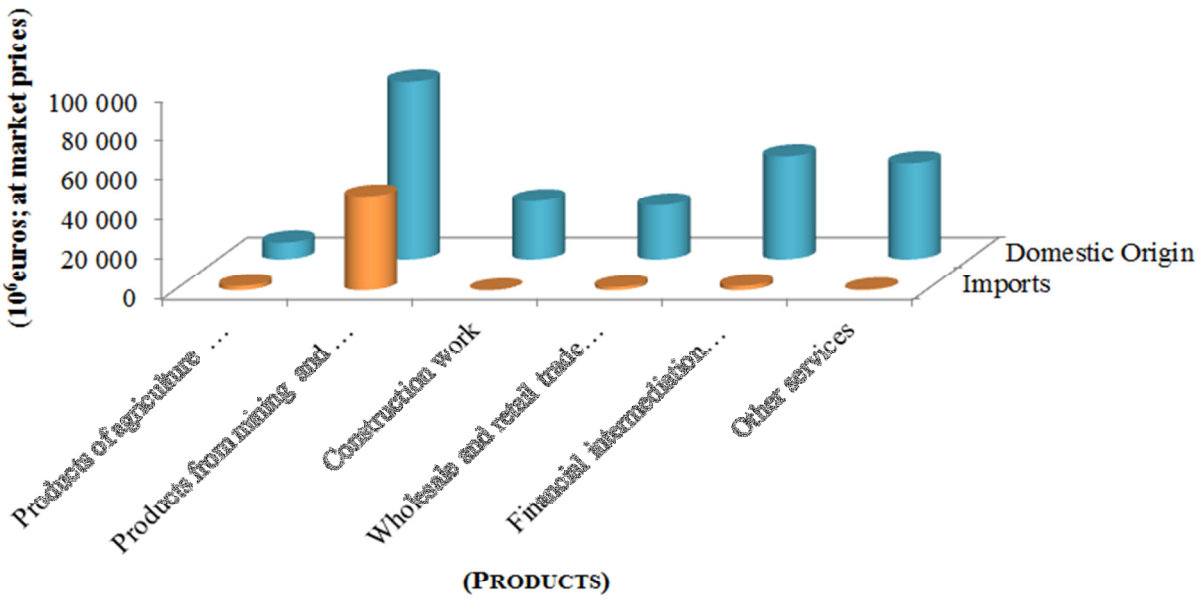
85% of domestic production is used internally, with the remaining 15% being exported. Most of the exported products come from mining and quarrying, manufactured products and energy products, which are also the most representative in domestic production, as seen above.

Table 9. "Portugal-05" Domestic Demand: what origin?

	Imports		Domestic Origin		Total (at market prices)	
	10^6 euros	%	10^6 euros	%	10^6 euros	%
Products						
Products of agriculture …	2 219	21	8 377	79	10 596	100
Products from mining and …	47 345	35	89 678	65	137 022	100
Construction work	1	0	29 270	100	29 270	100
Wholesale and retail trade…	1 622	6	27 141	94	28 763	100
Financial intermediation…	2 155	4	51 918	96	54 074	100
Other services	396	1	48 485	99	48 881	100
Total	53 737	17	254 868	83	308 606	100

Source: Table A.2.

Chart 7."Portugal-05" Domestic Demand: what origin?



Source: Table 9

[see Table 9 and Chart 7]

The domestic production used internally is valued at basic prices, but, after being valued at market prices (i.e. when the net taxes on products are added to the basic prices), it satisfies 83% of domestic demand, with the remaining 17% being satisfied by imports.

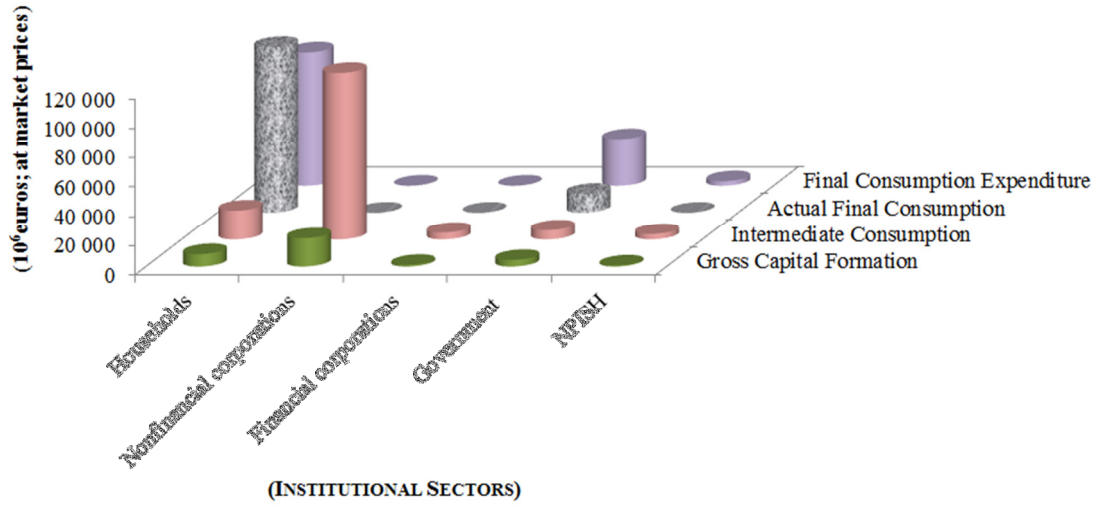
Besides being the most exported products, products from mining and quarrying, manufactured products and energy products are also the most imported ones, since 35% of domestic demand is not satisfied by products with domestic origin. On the other hand, although the products of agriculture, hunting, forestry, fisheries and aquaculture need to be imported to satisfy 21% of domestic demand, this relative importance does not exist in absolute terms.

Table 10. "Portugal-05" Domestic Demand: what composition?

	Intermediate Consumption		Final Consumption		Gross Capital Formation		Total (at market prices)	
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%
Institutions (with Final Consumption Expenditure)								
Households	19 847	17	91 658	76	8 366	7	119 871	100
Nonfinancial corporations	113 807	86	0	0	19 221	14	133 027	100
Financial corporations	4 635	82	0	0	1 037	18	5 671	100
Government	6 316	15	31 974	75	4 380	10	42 670	100
NPISH	3 708	50	3 012	41	645	9	7 366	100
Total	148 312	48	126 644	41	33 649	11	308 606	100
Institutions (with Actual Final Consumption)								
Households	19 847	14	113 791	80	8 366	6	142 005	100
Nonfinancial corporations	113 807	86	0	0	19 221	14	133 027	100
Financial corporations	4 635	82	0	0	1 037	18	5 671	100
Government	6 316	27	12 853	55	4 380	19	23 549	100
NPISH	3 708	85	0	0	645	15	4 354	100
Total	148 312	48	126 644	41	33 649	11	308 606	100
Products								
Products of agriculture …	6 666	63	3 670	35	259	2	10 596	100
Products from mining and …	77 270	56	49 016	36	10 735	8	137 022	100
Construction work	11 663	40	116	0	17 491	60	29 270	100
Wholesale and retail trade…	15 043	52	13 356	46	363	1	28 763	100
Financial intermediation…	33 714	62	15 976	30	4 383	8	54 074	100
Other services	3 955	8	44 509	91	417	1	48 881	100
Total	148 312	48	126 644	41	33 649	11	308 606	100

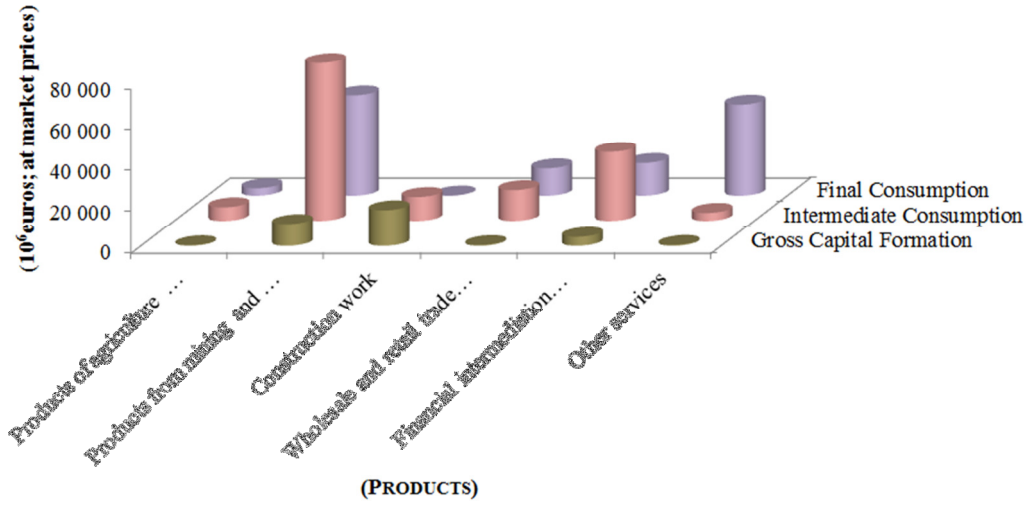
Sources: Tables A.2 and A.5.

Chart 8. "Portugal-05" Domestic Demand by Institutional Sectors: what composition?



Source: Table 10

Chart 9. "Portugal-05" Domestic Demand by Products: what composition?



Source: Table 10

[See Table 10 and Charts 8 and 9]

Intermediate and final consumption account for almost all of the domestic demand (48% and 41% respectively), whereas gross capital formation represents the remaining 11%. Intermediate consumption accounts for 86% of the demand of non-financial corporations and 82% of the demand of financial corporations, while more than half of the demand for four of the six groups of products is put to the same use. The two groups of products whose demand composition does not have its main share in intermediate consumption are construction work, where 60% of demand is for gross capital formation, including acquisitions net of disposals of dwelling by households, and other services, where 91% of demand is for final consumption.

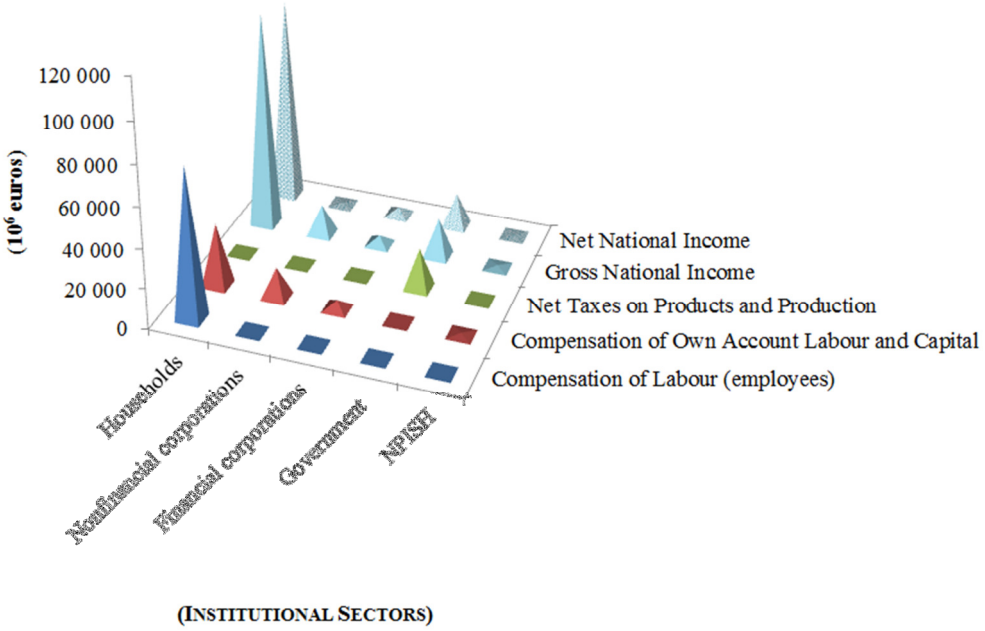
Some differences can be identified in the amounts and composition of the demand of households, the government and the NPISH, depending on whether we consider final consumption expenditure or the actual final consumption. Thus, final consumption expenditure is, respectively, 76%, 75% and 41% of total demand in the case of those three institutional sectors and (in the same order) that share changes to 80%, 55% and 0% of total demand if we consider the actual final consumption. Therefore, when households receive social transfers in kind from the government and the NPISH, the part of (actual) final consumption in the total demand of households increases by four percentage points. In turn, the corresponding parts of the government and of the NPISH decrease by twenty percentage points and forty-one percentage points, respectively.

Table 11. "Portugal-05" National Income: what origin and distribution?

Institutions	Compensation of Labour (employees) (10^6 euros)	Compensation of Own Account Labour and Capital (10^6 euros)	Net Taxes on Products and Pruduction (10^6 euros)	Gross National Income		Net National Income	
				10^6 euros	%	10^6 euros	%
Households	75 198	31 058	0	106 255	73	99 448	82
Nonfinancial corporations	0	15 009	0	15 009	10	828	1
Financial corporations	0	4 638	0	4 638	3	4 050	3
Government	0	- 707	20 045	19 338	13	16 717	14
NPISH	0	984	0	984	1	428	0
Total	75 198	50 981	20 045	146 223	100	121 470	100

Sources: Tables A.2 and A.5.

Chart 10. "Portugal-05" National Income: what origin and distribution?



Source: Table 11

[See Table 11 and Chart 10]

The gross domestic product (at market prices), which is also the gross domestic income, becomes national income after the primary income generated in the domestic economy by non-residents is deducted and the primary income generated abroad by residents is added to the amount. This generated primary income includes the compensation of labour (employees), own account labour and capital, and the net indirect taxes (or net taxes on products and production), which take into account the valuation of the gross domestic product and the compensation of the government. Thus, more than half of national income is compensation of labour, which is received entirely by

households, contributing to the share of 73% of the total gross national income received by that institutional sector, jointly with the compensation of own account labour and capital. The remaining 27% of the gross national income, or of the income generated by residents (in the economy and in the rest of the world), is distributed to the government (13%), non-financial corporations (10%), financial corporations (3%) and NPISH (1%). What is really quite curious is the distribution of net national income (the gross national income minus the consumption of fixed capital), especially the share of non-financial corporations, which are responsible for 65% of domestic production, and whose 10% share of gross national income is reduced to 1% when the depreciation of fixed capital is considered.

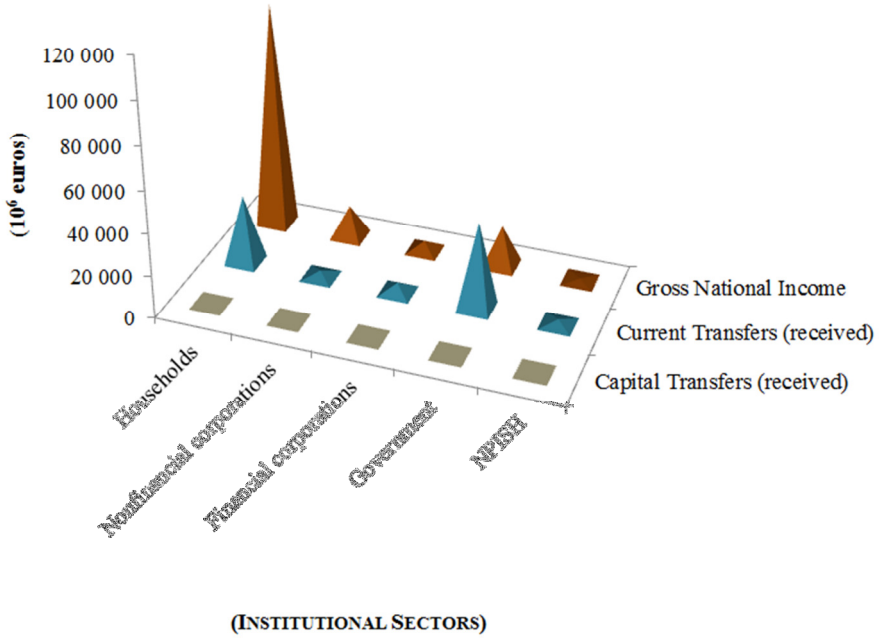
Since both the amounts and the significance of the consumption of fixed capital have not been sufficiently studied by the author, our analysis will continue in gross terms.

Table 12. "Portugal-05" Income in Cash: what origin and distribution?

	Gross National Income		Current Transfers (received)		Capital Transfers (received)		Income in Cash		
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	%
Institutions									
Households	106 255	75	32 288	23	2 326	2	140 870	100	59
Nonfinancial corporations	15 009	75	2 966	15	1 991	10	19 966	100	8
Financial corporations	4 638	40	4 639	40	2 279	20	11 556	100	5
Government	19 338	30	41 128	64	3 590	6	64 055	100	27
NPISH	984	26	2 443	64	392	10	3 819	100	2
Total	146 223	61	83 464	35	10 578	4	240 266	100	100

Source: Table A.2.

Chart 11. "Portugal-05" "Portugal-05" Income in Cash: what origin and distribution?



Source: Table 12

[See Table 12 and Chart 11]

By adding the current and capital transfers to the gross national income, we were able to calculate the so-called income in cash, whose origin and distribution by institutional sectors can be seen in Table 12[10]. Thus, 59% of the total income in cash is accounted for by households, 75% of which originates from gross national income, 23% from current transfers and 2% from capital transfers. The government has the second most important share of that income, namely 27% of the total, 64% of which originates from current transfers and 30% from gross national income. The remainder is distributed among the other three institutional sectors: 8% for non-financial corporations, 5% for financial corporations and 2% for NPISH.

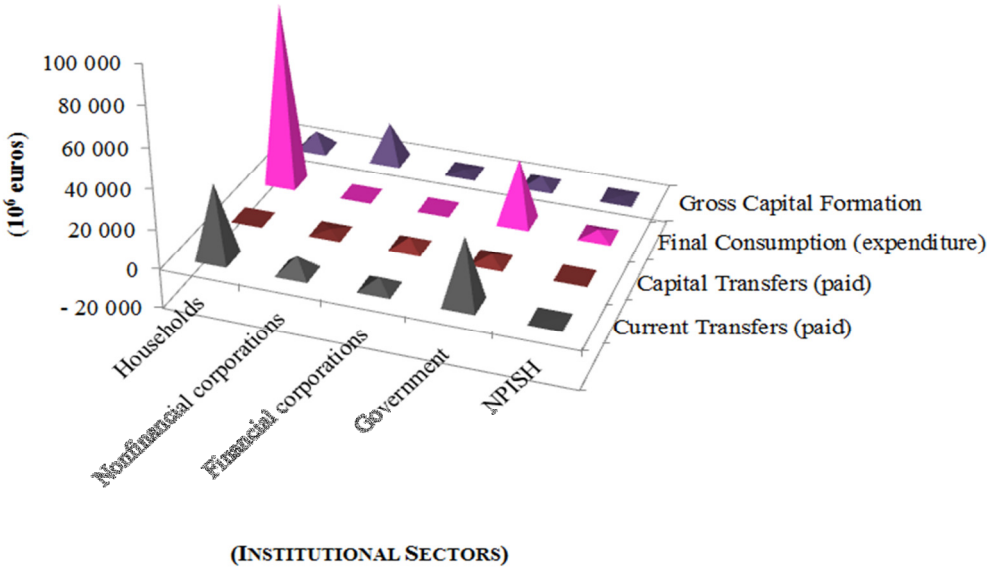
[10] Tables A.6.1 and A.6.2, in the appendix, show the links between gross national income and income in cash through gross disposable income.

Table 13. "Portugal-05" Cash Needs: what origin and distribution?

	Current Transfers (paid)		Capital Transfers (paid)		Final Consumption		Gross Capital Formation		Cash Needs		
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	%
Institutions											
Households	37 342	27	- 1 222	-1	91 658	67	8 366	6	136 145	100	54
Nonfinancial corporations	8 091	28	1 412	5	0	0	19 221	67	28 724	100	11
Financial corporations	5 205	48	4 633	43	0	0	1 037	10	10 875	100	4
Government	33 267	46	3 457	5	31 974	44	4 380	6	73 079	100	29
NPISH	114	3	7	0	3 012	80	645	17	3 778	100	1
Total	84 019	33	8 288	3	126 644	50	33 649	13	252 600	100	100

Source: Table A.2.

Chart 12. "Portugal-05" Cash Needs: what origin and distribution?



Source: Table 13

[See Table 13 and Chart 12]

The institutional sectors require income for consumption and investment purposes, as well as for transfer, this will be the so-called cash needs. Thus, if the income in cash is not sufficient to satisfy those requirements, the institutional sectors will have net borrowing; otherwise, they will have net lending.

Households account for 54% of the cash needs by the institutions as a whole, 67% of which is used for final consumption. The government is the second institutional sector that requires more income (29% of the total), 46% of which is used to pay current transfers and 44% for final consumption (most of which will be used for the actual final consumption of households, as was seen above).

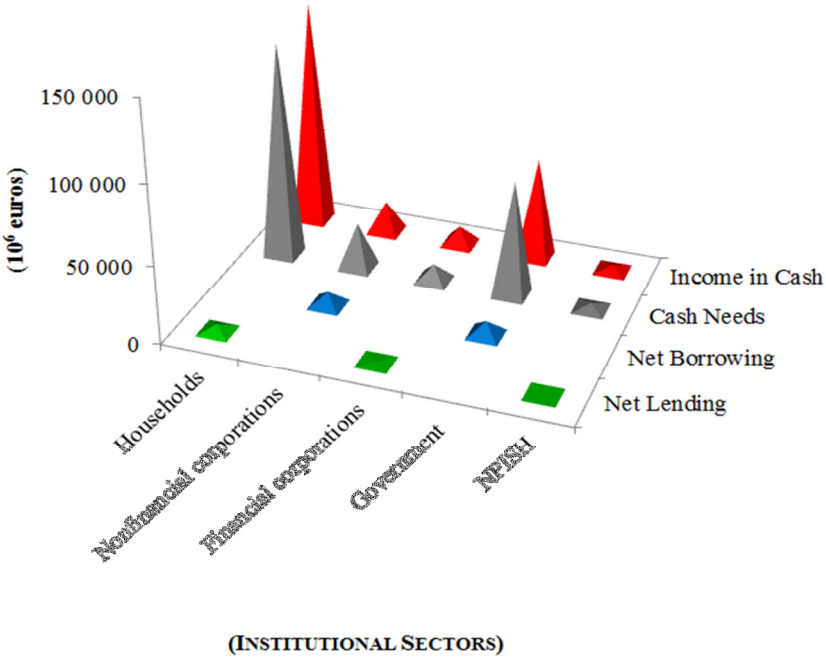
Non-financial corporations, with an 11% share of the cash needs of the whole economy, represent the institutional sector that invests most, in other words that spends most on gross capital formation. However, as can be seen in Table A.6.3 (in the appendix), although 98% of the gross capital formation of non-financial corporations is gross fixed capital formation, 74% is used to cover the consumption of fixed capital and only 25% is used for net fixed capital formation.

Table 14. "Portugal-05" Net Lending or Net Borrowing?

	Income in Cash	Cash Needs	Net Lending		Net Borrowing	
	10^6 euros	10^6 euros	10^6 euros	% (of Income in Cash)	10^6 euros	% (of Cash Needs)
Institutions						
Households	140 870	136 145	4 725	3		
Nonfinancial corporations	19 966	28 724			8 758	30
Financial corporations	11 556	10 875	681	6		
Government	64 055	73 079			9 023	12
NPISH	3 819	3 778	40	1		
Total	240 266	252 600			12 335	5

Source: Table A.2.

Chart 13. "Portugal-05" Net Lending or Net Borrowing?



Source: Table 14

[See Table 14 and Chart 13]

3% of the households' income in cash exceeds the cash needs, the same thing happening with the financial corporations and the NPISH, with 6% and 1% of their incomes in cash, respectively; these are the institutions with net lending. With larger proportions, the non-financial corporations and the government have net borrowing because 30% and 12% of the respective cash needs were not covered by the corresponding incomes in cash. Thus, the net lending of the former was not enough to cover the net borrowing of the latter and the economy as a whole was led into a situation of net borrowing, with 5% of the cash needs not being covered by the income in cash.

From the above analysis, especially the part relating to income, it can be seen that households occupy a prominent place within the institutional sectors. Although the analysis cannot be taken any further within the households themselves, since we do not have the necessary information at any level of disaggregation, some more work needs to be done in investigating households and their linkages with the other institutional sectors, namely, the government.

In the so-called institutional balances of those two sectors, represented by Tables 15 and 16[11], all of the information analysed above was gathered together, and, with the addition of some further information, it became possible to form an immediate picture of all the details relating to the institutional sector. In these institutional balances, the totals of the current and capital accounts show the following: on the resources side is the income in cash, presented in Table 12; on the uses side is the cash needs, presented in Table 13; on the balance side is the net lending or borrowing, presented in Table 14. The institutional gross domestic product at basic prices and its components, presented in Tables 5 and 6, are also part of the institutional balances, as is the institutional financial account.

The financial account is included here, as an indication of the author's intention to return to its study in future work. In fact, in her first works on the SAM, the author worked with disaggregated institutional financial accounts. However, this later became impossible, due to the lack of information in the "from whom to whom" matrices for financial transactions, which consequently made it impossible to fill in the corresponding SAM submatrices – financial transactions within domestic institutions, financial transactions from the rest of the world and financial transactions to the rest of the world, as also mentioned in Section 2.1. Because the author thinks that the snapshot of the reality under study can be enriched with this aspect, as well as the possible scenarios resulting from experiments, the disaggregation of the financial account of institutional sectors and the

[11] The institutional balances for the other three sectors (non-financial corporations, financial corporations and NPISH) and the domestic institutions (total), are shown in the appendix: Tables A.6.4 – A.6.7.

corresponding analysis is now considered to be a major item in the author's future research agenda. Therefore, this part will not be included in the analyses made of this application.

As mentioned above, our experiment consisted of studying the impact of a 1% reduction in the rate of the direct taxes paid by households to the government, i.e. the current taxes on income, wealth, etc., paid by households to the government, per unit of received aggregate income (the totals of row/column 15 of Table A.2). In our application, this means that households paid, and the government received, 1385 million euros less. Direct taxes are classified as current transfers from households to government.

In Tables 15 and 16, those cells that have thicker borders indicate the parts where these taxes are included, with their absolute and relative positions in the small sub table being specified in the lower right-hand corner.

Thus, from Table 15, it can be seen that the current transfers from the households to domestic institutions represent 25% of its cash needs and account for 43% of the current transfers within domestic institutions. In these transfers, 80% is transferred to the government, 24% of which is in the form of current taxes on income, wealth, etc. The current transfers to the government are 20% of the cash needs of households, of which 6% consists of current taxes on income, wealth, etc. Our experiment involved a 4% reduction in the current transfers from households to domestic institutions, which represent 1% of the cash needs of the households.

In turn, Table 16 shows that the current transfers received by the general government from domestic institutions represent 63% of its total income in cash and 51% of the current transfers within domestic institutions. In those transfers, 68% is received from households, 21% of which is in the form of current taxes on income, wealth, etc. The current transfers from households represent 43% of the general government's income in cash, of which 13% consists of current taxes on income, wealth, etc. Our experiment involved a 3% reduction in the current transfers received by the general government from domestic institutions, which represents 2% of the general government's income in cash.

Therefore, the income that is the object of our experiment directly involves both the households and the government. On the one hand, it directly represents 4% of the total current transfers paid by households and 3% of the total current transfers received by the general government. On the other hand, it represents 1% of the households' cash needs and 2% of the general government's income in cash.

Table 15. "Portugal-05" Institutional balance of Households

	Resources, Receipts,Changes in Liabilities and net Worth [SAM row(f)]	10^6 euros	(%)(d)	(%) (e)	Uses, Expenditure,Changes in Assets [SAM column(f)]	10^6 euros	(%)(d)	(%) (e)	Balance 10^6 euros	Balance (%) (e)
1. Current Account (a)		138 544	98	60		129 000	95	61	9 544	50
	Gross National Income at factor cost	106 255	75	84	Final Consumption	91 658	67	72		
	Current transfers from domestic institutions	28 875	20	37	Current transfers to domestic institutions	34 188	25	43		
	Current transfers from the RW	3 413	2	74	Current transfers to the RW	3 154	2	61		
2. Capital Account		2 326	2	22		7 145	5	17	- 4 818	15
					Gross Capital Formation	8 366	6	25		
	Capital transfers from domestic institutions	2 174	2	27	Capital transfers to domestic institutions	122	0	1		
	Capital transfers from the RW	152	0	6	Capital transfers to the RW	- 1 344	-1	-1182		
3 = 1 + 2 (b)		140 870	100	59		136 145	100	54	4 725	-38
Production Account (c)	Production	46 508	---	17	Intermediate Consumption	19 847	---	13	26 661	21
Financial Account (g) (with NPISH)		10 688	100	15		15 454	100	27	- 4 766	-39
	Monetary gold and SDRs; Currency and deposits	0	0	0	Monetary gold and SDRs; Currency and deposits	991	6	9		
	Securities other than shares	- 65	-1	-1	Securities other than shares	88	1	1		
	Loans	11 627	109	57	Loans	4	0	0		
	Shares and other equity	0	0	0	Shares and other equity	6 589	43	63		
	Insurance technical reserves	0	0	0	Insurance technical reserves	7 842	51	97		
	Other accounts receivable/payable	- 876	-8	25	Other accounts receivable/payable	- 60	0	3		
	Statistical discrepancy	2	0	2						

Sources: Table A.2 (rows/columns 15 and 20); Table A.5 (column S.14)

(a) Balance = Gross saving.
(b) Resources..= Income in Cash; Uses,..= Cash Needs;
Balance = Net lending (+)/borrowing (-).
(c) Balance = Gross Domestic Product at basic prices.
(d) Regarding the total of the institution.
(e) Regarding the total of all institutions.
(f) In the case of current and capital accounts.
(g) Balance = Net lending (-)/borrowing (+).

	10^6 euros	% (1)	% (2)
Current transfers to the government	27 258	80	20
- current taxes on income, wealth, etc.	8 275	24	6
reduction in current taxes on income, wealth, etc	- 1 385	-4	-1

(1) of total current transfers to domestic institutions
(2) of Cash Needs

Table 16. "Portugal-05": Institutional balance of General Government

	Resources, Receipts,Changes in Liabilities and net Worth				Uses, Expenditure,Changes in Assets				Balance	
	[SAM row(f)]	10^6 euros	(%)(d)	(%) (e)	[SAM column(f)]	10^6 euros	(%)(d)	(%) (e)	10^6 euros	(%) (e)
1. Current Account (a)		60 466	94	26		65 241	89	31	- 4 775	-25
	Gross National Income at factor cost	- 707	-1	-1	Final Consumption	31 974	44	25		
	Net taxes on production	- 854	-1	100						
	Net taxes on products	20 899	33	100						
	Current transfers from domestic institutions	40 084	63	51	Current transfers to domestic institutions	31 622	43	40		
	Current transfers from the RW	1 044	2	23	Current transfers to the RW	1 644	2	32		
2. Capital Account		3 590	6	34		7 838	11	19	- 4 248	14
					Gross Capital Formation	4 380	6	13		
	Capital transfers from domestic institutions	2 124	3	26	Capital transfers to domestic institutions	3 661	5	45		
	Capital transfers from the RW	1 466	2	61	Capital transfers to the RW	- 203	0	-179		
3 = 1 + 2 (b)		64 055	100	27		73 079	100	29	- 9 023	73
Production Account (c)	Production	30 278	---	11	Intermediate Consumption	6 316	---	4	23 962	19
Financial Account (g)		9 602	100	14		579	100	1	9 023	73
	Monetary gold and SDRs; Currency and deposits	538	6	3	Monetary gold and SDRs; Currency and deposits	880	152	8		
	Securities other than shares	10 313	107	93	Securities other than shares	520	90	3		
	Loans	- 174	-2	-1	Loans	281	49	2		
	Shares and other equity	0	0	0	Shares and other equity	- 523	-90	-5		
	Insurance technical reserves	0	0	0	Insurance technical reserves	2	0	0		
	Other accounts receivable/payable	- 1 073	-11	30	Other accounts receivable/payable	- 581	-100	29		
	Statistical discrepancy	- 2	0	-2						

Sources: Table A.2 (rows/columns 18 and 23); Table A.5 (column S.13)

(a) Balance = Gross saving.
(b) Resources..= Income in Cash; Uses,..= Cash Needs;
Balance = Net lending (+)/borrowing (-).
(c) Balance = Gross Domestic Product at basic prices.
(d) Regarding the total of the institution.
(e) Regarding the total of all institutions.
(f) In the case of current and capital accounts.
(g) Balance = Net lending (-)/borrowing (+).

	10^6 euros	% (1)	% (2)
Current transfers from the households	27 258	68	43
- current taxes on income, wealth, etc.	8 275	21	13
reduction in current taxes on income, wealth, etc	- 1 385	-3	-2

(1) of total current transfers from domestic institutions
(2) of Income in Cash

"Scenario-AC" and "Scenario-MM" represent the global impacts of the above-mentioned reduction, calculated from the two algebraic versions of the SAM described in Section 2.2, which are the accounting multipliers and the *master* model, respectively.

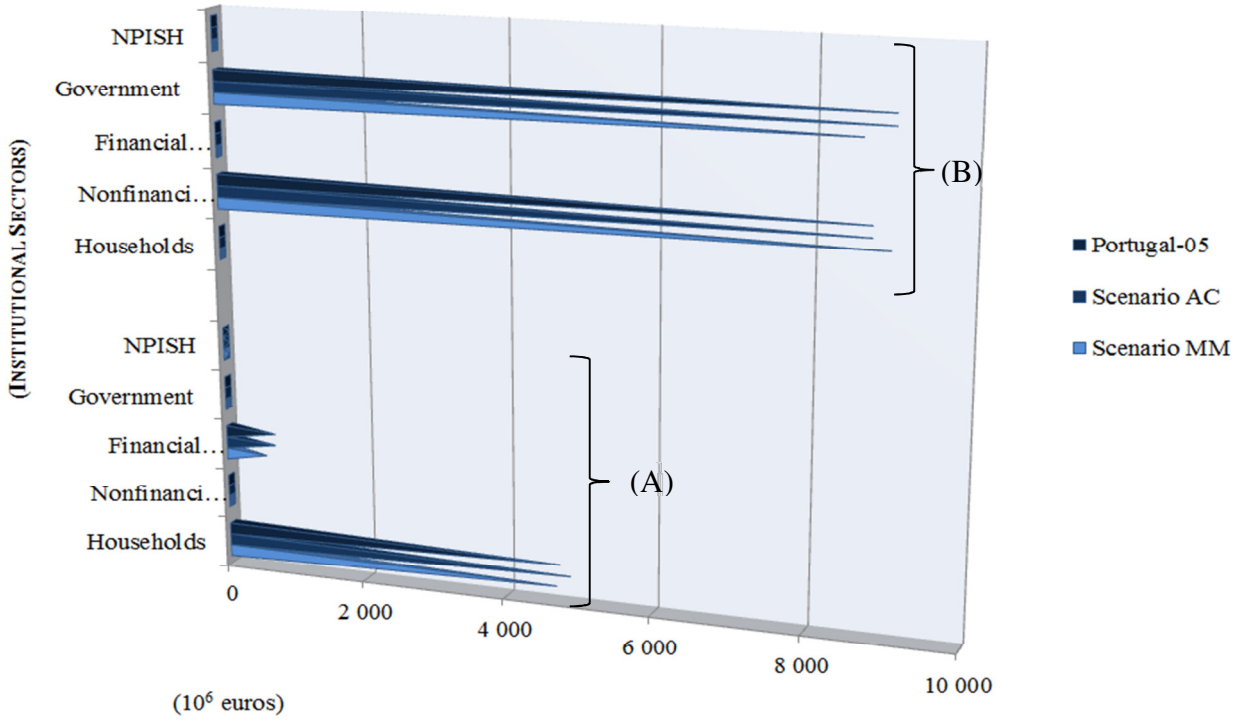
Table 17. "Scenarios": Impacts on Net Lending and Net Borrowing

Institutions	Income in Cash	Cash Needs	Net Lending		Net Borrowing	
	10^6 euros	10^6 euros	10^6 euros	% (of Income in Cash)	10^6 euros	% (of Needed Income)
Scenario AC						
Households	- 1 241	- 1 385	145	0		
Nonfinancial corporations	- 15	- 15			0	0
Financial corporations	- 21	- 21	0	0		
Government	- 1 605	- 1 605			0	0
NPISH	- 24	- 24	0	0		
Total	- 2 906	- 3 050			- 145	0
Scenario MM						
Households	- 2 558	- 2 513	- 45	0		
Nonfinancial corporations	- 303	- 69			235	1
Financial corporations	- 143	- 7	- 136	-1		
Government	- 2 283	- 2 684			- 402	0
NPISH	- 17	- 16	- 1	0		
Total	- 5 304	- 5 290			15	0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 14 (similar tables were constructed for both scenarios).

Chart 14. "Scenarios": Impacts on Net Lending (A) and Net Borrowing (B)



Sources: Tables 14 and 17

[See Tables 14 and 17 and Chart 14]

A reduction of 1385 million euros in direct taxes had a negative global impact both on cash needs and on income in cash. This impact was felt at the level of all the institutional sectors and was greater in Scenario-MM than in Scenario-AC. Consequently, the repercussions at the level of net lending or borrowing were different and greater in the former scenario than in the latter, although the institutional sectors that had net lending and net borrowing continued to be the same.

These differences reflect the methodologies underlying the two scenarios. In fact, as seen in Section 2.2.3, although they have some common assumptions, they are different mainly because Scenario-AC works with endogenous and exogenous accounts (and fixed average expenditure propensities) while Scenario-MM works with endogenous and exogenous parameters and variables. This means that, despite the limitations of the fixed parameters and variables of Scenario-MM, when shocks are introduced into certain flows of money, it can measure effects (at least in part) that are not measured by Scenario-AC. In our experiment, Scenario-AC set the (current and capital) accounts of the households as exogenous, as well as the financial and the rest of the world accounts. Consequently, considering the importance of the households in the distribution of income, identified in the snapshot of "Portugal-05" in the first part of this section, certain important impacts were not measured in Scenario-AC. This explains the zero differences in net lending and net borrowing found in the latter scenario, as well as the equal differences recorded in income in cash and in cash

needs in institutional sectors other than households. As the difference in the cash needs of households in Scenario AC was the direct impact of our shock (a reduction of 1385 million euros in direct taxes), the difference in income in cash, which had no unmeasured effects, allowed for an increase in the corresponding net lending. In turn, this increase allowed for an equal reduction in the net borrowing of the economy as a whole, since there were no differences in the net lending and net borrowing of the other institutional sectors.

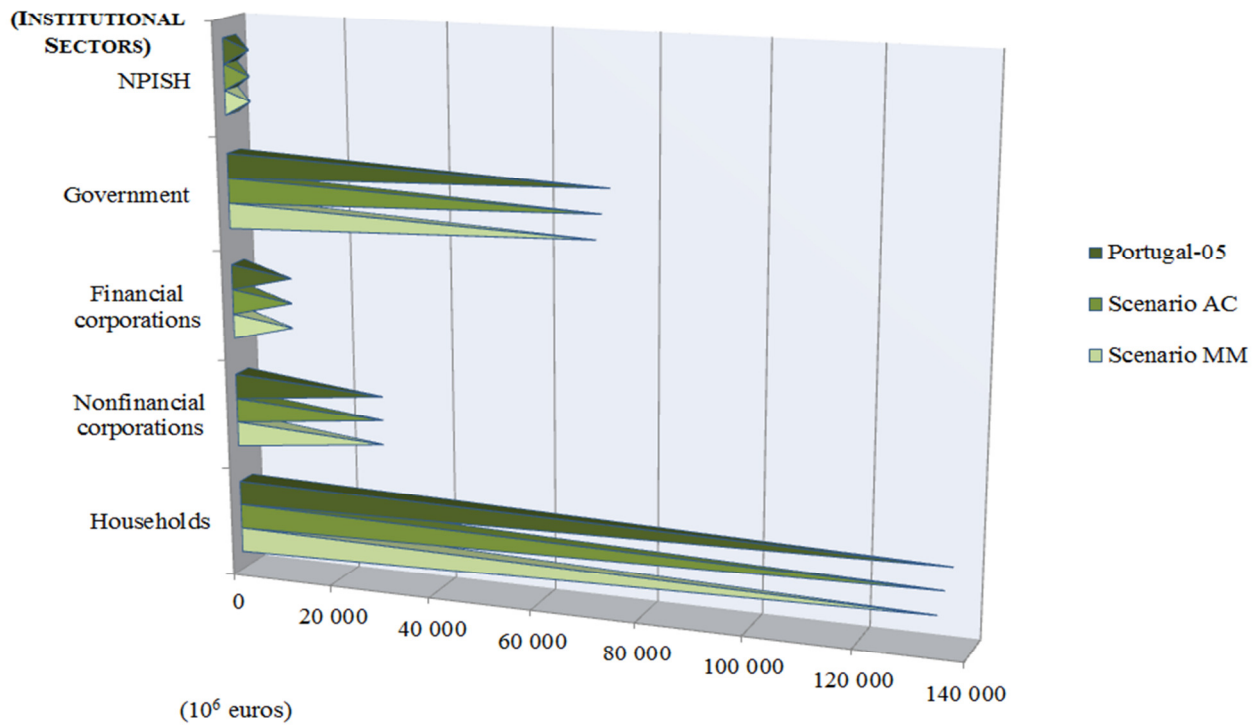
Table 18. "Scenarios": Impacts on Cash Needs

	Current Transfers (paid)		Capital Transfers (paid)		Final Consumption (expenditure)		Gross Capital Formation		Cash Needs		
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	%
Scenario AC											
Households	- 1 385	-0,7	0	0,0	0	0,7	0	0,1	- 1 385	0,0	0,1
Nonfinancial	- 20	-0,1	0	0,0	0	0,0	5	0,1	- 15	0,0	0,1
Financial corporations	- 9	0,0	- 10	0,0	0	0,0	- 2	0,0	- 21	0,0	0,0
Government	- 905	-0,2	75	0,2	- 870	-0,2	95	0,3	- 1 605	0,0	-0,3
NPISH	- 1	0,0	0	0,0	- 25	-0,1	1	0,1	- 24	0,0	0,0
Total	- 2 321	-0,5	66	0,1	- 895	0,3	99	0,2	- 3 050	0,0	0,0
Scenario MM											
Households	- 2 076	-1,0	0	0,0	- 436	0,9	- 1	0,1	- 2 513	0,0	0,1
Nonfinancial	- 66	-0,2	0	0,0	0	0,0	- 3	0,1	- 69	0,0	0,2
Financial corporations	- 6	0,0	0	0,0	0	0,0	- 1	0,0	- 7	0,0	0,1
Government	0	1,7	0	0,2	- 2 684	-2,1	- 1	0,2	- 2 684	0,0	-0,5
NPISH	0	0,0	0	0,0	- 16	-0,1	0	0,1	- 16	0,0	0,0
Total	- 2 147	-0,2	0	0,1	- 3 136	-0,2	- 6	0,3	- 5 290	0,0	0,0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 13 (similar tables were constructed for both scenarios).

Chart 15. "Scenarios": Impacts on Cash Needs



Sources: Tables 13 and 18

[See Tables 13 and 18 and Chart 15]

Also reflecting global impacts at the level of households, Scenario-MM clarifies the importance of the households and their influence on the level of the income in cash and cash needs of the other sectors and, consequently, on their net lending and borrowing, as well as on the net borrowing of the economy as a whole. In fact, the decrease in the three sectors with net lending and the increase of the net borrowing of the non-financial corporations led to an increase in the net borrowing of the economy as a whole, despite the decrease in the government's share.

Whereas in Scenario-AC the origin of the above-mentioned negative global impact on cash needs is mainly to be found in current transfers (paid), in Scenario-MM it is final consumption that is mainly responsible for this impact.

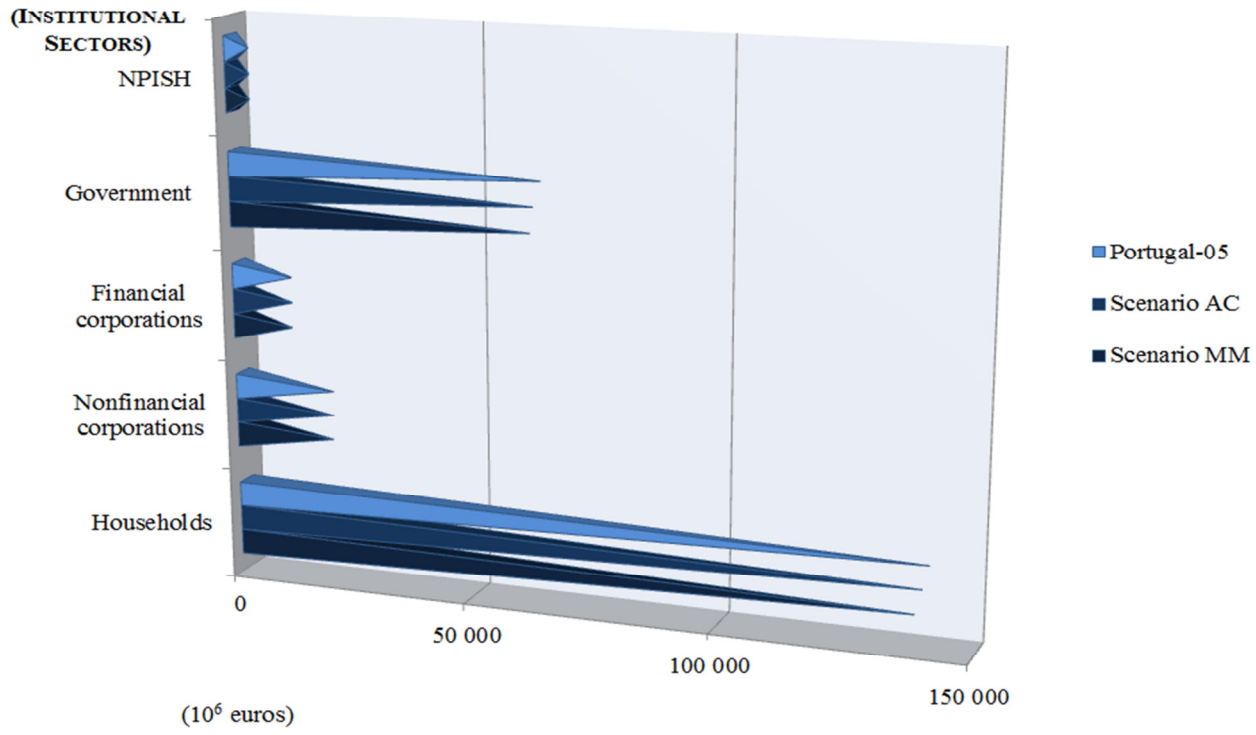
Table 19. "Scenarios": Impacts on Income in Cash

	Gross National Income		Current Transfers (received)		Capital Transfers (received)		Income in Cash		
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	%
Scenario AC									
Households	- 612	0,2	- 631	-0,2	1	0,0	- 1 241	0,0	0,2
Nonfinancial corporations	- 42	-0,2	- 2	0,0	30	0,2	- 15	0,0	0,1
Financial corporations	- 13	0,0	- 4	0,0	- 4	0,0	- 21	0,0	0,1
Government	- 32	0,7	- 1 614	-0,9	40	0,2	- 1 605	0,0	-0,3
NPISH	- 3	0,1	- 25	-0,3	4	0,2	- 24	0,0	0,0
Total	- 701	0,4	- 2 275	-0,5	71	0,1	- 2 906	0,0	0,0
Scenario MM									
Households	- 2 559	-0,5	0	0,4	0	0,0	- 2 558	0,0	0,2
Nonfinancial corporations	- 261	-0,2	- 42	0,0	0	0,2	- 303	0,0	0,1
Financial corporations	- 81	-0,2	- 62	0,0	0	0,2	- 143	0,0	0,0
Government	- 254	0,7	- 2 029	-0,9	0	0,2	- 2 283	0,0	-0,4
NPISH	- 17	-0,3	0	0,3	0	0,0	- 17	0,0	0,0
Total	- 3 172	0,0	- 2 133	-0,1	0	0,1	- 5 304	0,0	0,0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 12 (similar tables were constructed for both scenarios).

Chart 16. "Scenarios": Impacts on Income in Cash



Sources: Tables 12 e 19

[See Tables 12, 19 and Chart 16]

In turn, whereas in Scenario-AC, the origin of the negative global impact on income in cash is mainly to be found in current transfers (received), in Scenario-MM it is gross national income that is mainly responsible for this impact, largely due to the impact felt at the level of the compensation of labour (employees), as shown by Table A.7.1 (in appendix).

These differences between the two scenarios tend to confirm the finding that the impacts on households' accounts (and their consequent repercussions on the accounts of the other institutional sectors, namely the government) are not measured in Scenario-AC, leading to greater impacts overall in Scenario-MM.

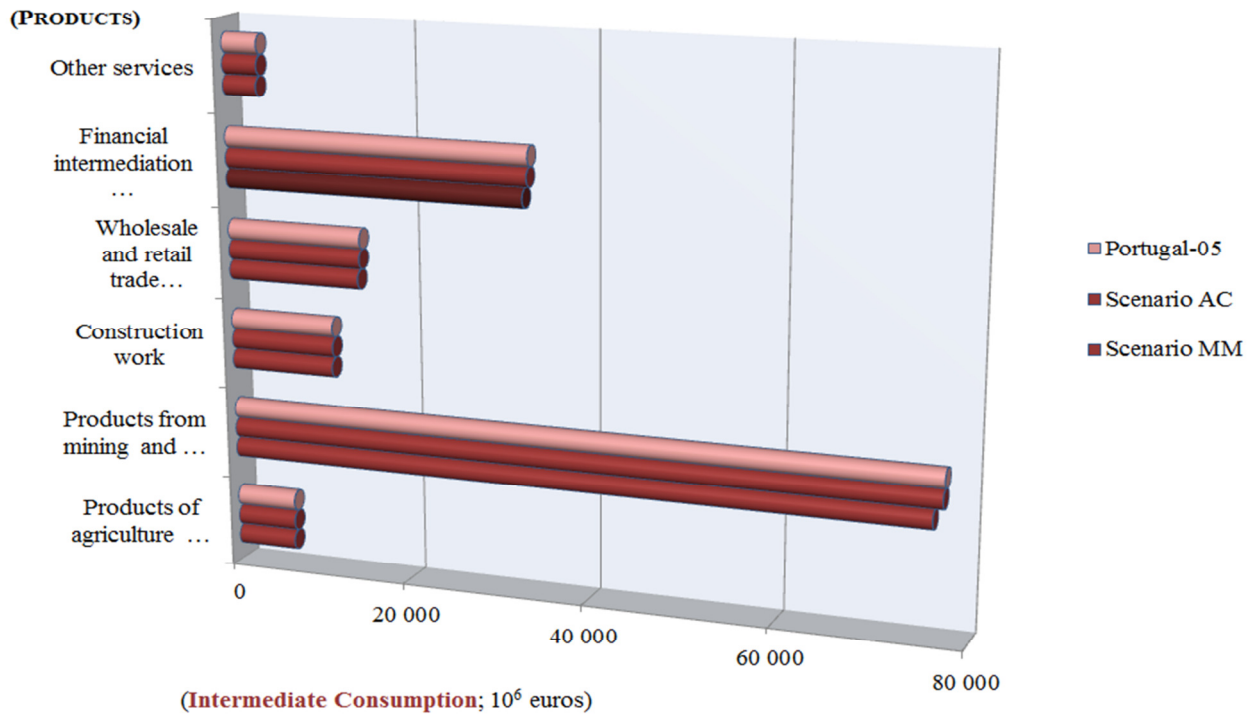
Table 20. "Scenarios": Impacts on Domestic Demand

	Intermediate Consumption		Final Consumption		Gross Capital Formation		Total (at market prices)	
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%
Scenario AC								
Products of agriculture …	- 10	0,0	0	0,0	0	0,0	- 10	0,0
Products from mining and …	- 145	0,0	- 43	0,0	21	0,0	- 167	0,0
Construction work	17	-0,1	0	0,0	76	0,1	93	0,0
Wholesale and retail trade…	- 61	-0,1	- 4	0,1	0	0,0	- 65	0,0
Financial intermediation…	- 121	-0,1	- 5	0,1	2	0,0	- 124	0,0
Other services	- 46	0,1	- 843	-0,1	0	0,0	- 889	0,0
Total	- 366	0,1	- 895	-0,1	99	0,1	- 1 161	0,0
Scenario MM								
Products of agriculture …	- 91	-0,2	- 17	0,2	1	0,0	- 108	0,0
Products from mining and …	- 1 120	-0,2	- 356	0,1	- 4	0,1	- 1 480	0,0
Construction work	- 71	-0,1	- 1	0,0	- 1	0,1	- 73	0,0
Wholesale and retail trade…	- 274	-0,3	- 75	0,3	0	0,0	- 349	0,0
Financial intermediation…	- 575	-0,3	- 88	0,2	0	0,1	- 664	0,0
Other services	- 154	0,1	- 2 599	-0,2	- 2	0,0	- 2 755	0,0
Total	- 2 287	0,1	- 3 136	-0,3	- 6	0,2	- 5 429	0,0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

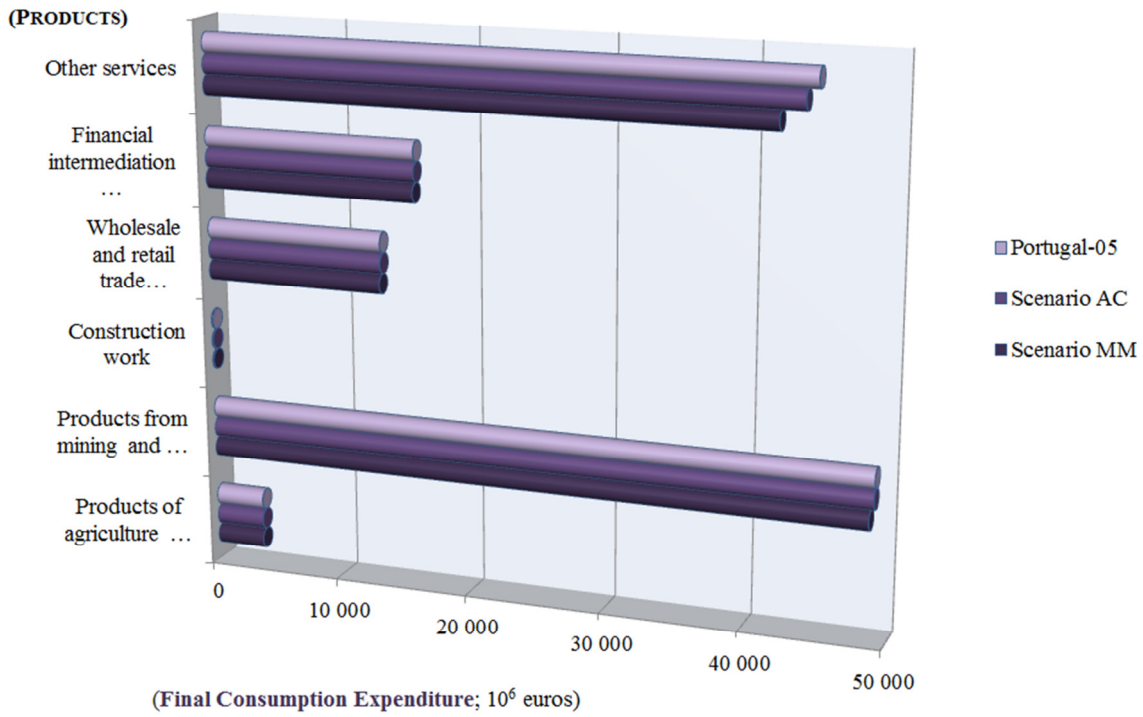
Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 10 (similar tables were constructed for both scenarios).

Chart 17. "Scenarios": Impacts on Domestic Demand – Intermediate Consumption



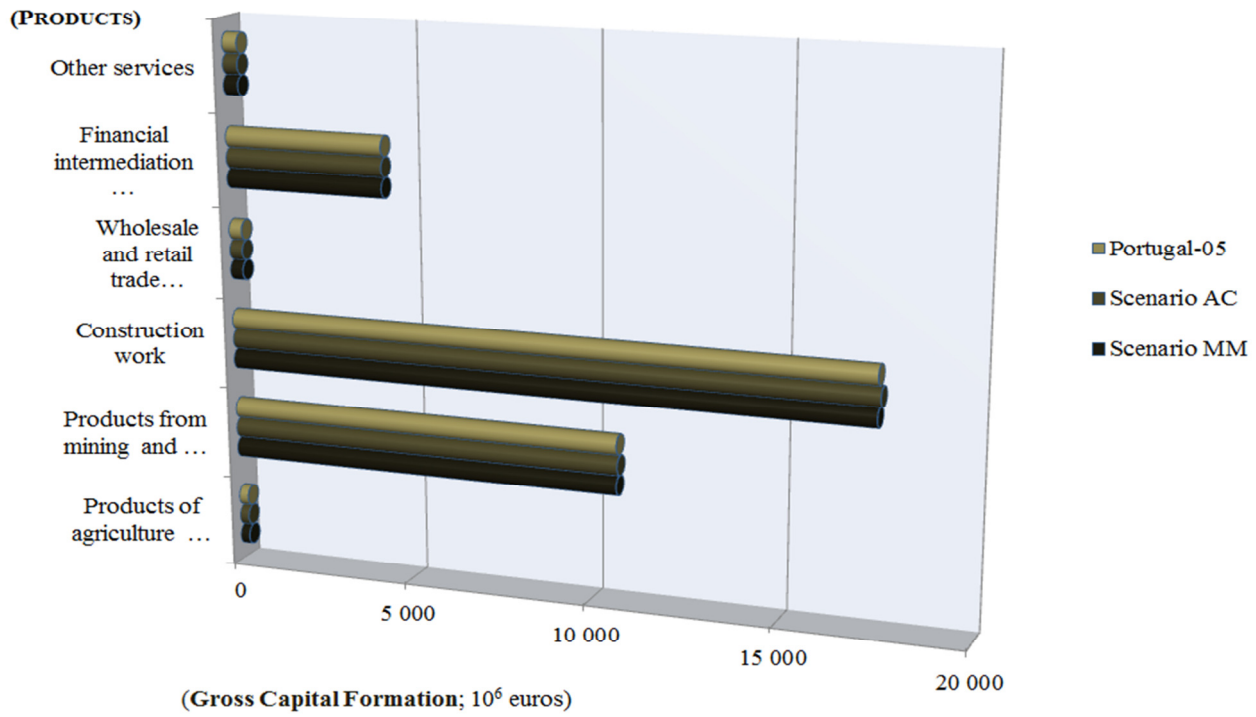
Sources: Tables 10 and 20

Chart 18. "Scenarios": Impacts on Domestic Demand – Final Consumption Expenditure



Sources: Tables 10 and 20

Chart 19. "Scenarios": Impacts on Domestic Demand – Gross Capital Formation



Sources: Tables 10 and 20

[See Tables 10 and 20 and Charts 17-19]

The negative overall impacts analysed above also represent repercussions on domestic demand and its components.

The negative impact on domestic demand is therefore explained by the negative impacts, on the one hand, on intermediate consumption, implicit in the gross national income – a component of income in cash – and, on the other hand, on final consumption and gross capital formation – components of cash needs.

Products from mining and quarrying, manufactured products and energy products and other services were the groups of products where the repercussions were most felt: in the former case, at the level of intermediate consumption; in the latter case, at the level of final consumption.

Since the rest of the world account was considered to be exogenous in the accounting multipliers and almost all transactions with the rest of the world were considered to be exogenous in the *master* model, the origin of domestic demand and the destination of domestic production will not be analysed.

On the other hand, since, in the snapshot of the reality under study (Portugal-05), domestic production by institutional sectors and the corresponding structure of costs were studied with data taken from the Integrated Economic Accounts, these will not be analysed either. Tables A.7.2 and

A.7.3. show the impacts at the level of those who produce and their production costs by sectors of activity.

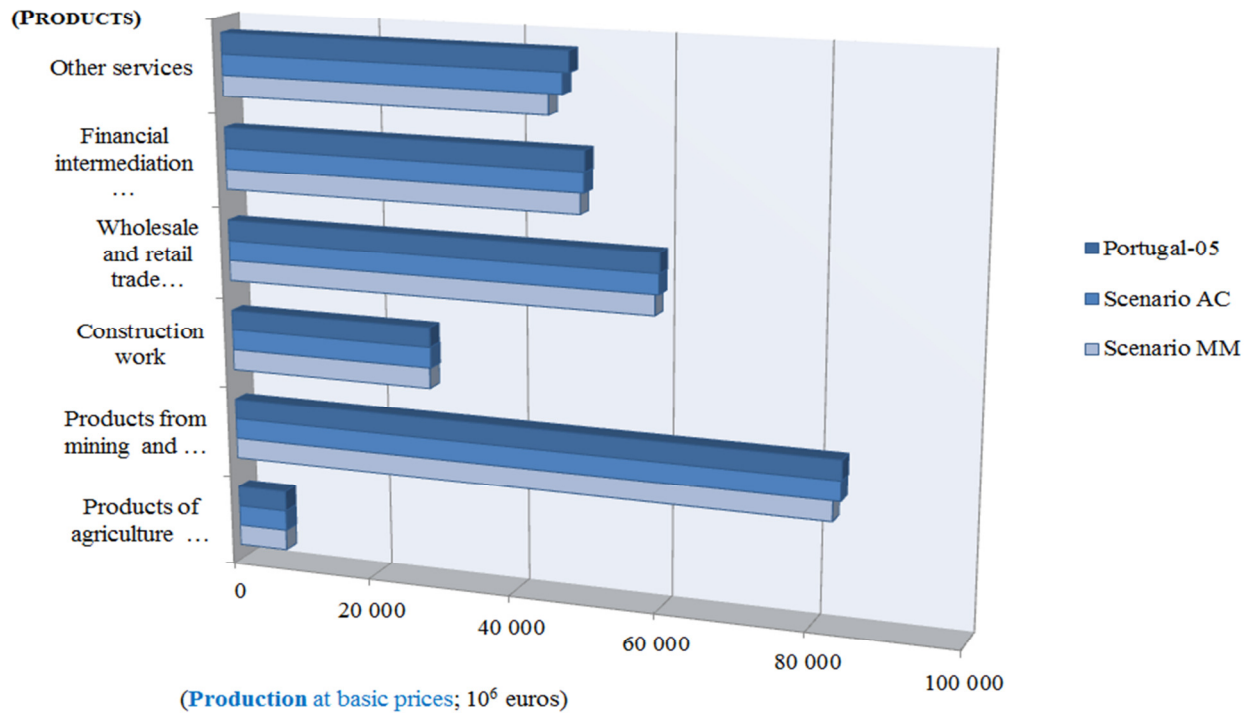
Table 21. "Scenarios": Impacts on Domestic Production

	Production		Gross Domestic Product			
	at basic prices				at market prices	
	10^6 euros	%	10^6 euros	%	10^6 euros	%
Scenario AC						
Products of agriculture …	- 6	0,0	4	0,0	4	0,0
Products from mining and …	- 83	0,1	62	0,1	48	0,1
Construction work	91	0,1	73	0,1	76	0,1
Wholesale and retail trade…	- 84	0,1	- 23	0,2	- 26	0,1
Financial intermediation…	- 111	0,0	9	0,1	1	0,1
Other services	- 866	-0,2	- 820	-0,5	- 835	-0,4
Total	- 1 061	0,0	- 695	0,0	- 732	0,0
Scenario MM						
Products of agriculture …	- 88	0,0	3	0,0	4	0,0
Products from mining and …	- 1 087	0,2	33	0,1	20	0,3
Construction work	- 71	0,2	1	0,3	3	0,2
Wholesale and retail trade…	- 592	0,2	- 317	0,5	- 320	0,4
Financial intermediation…	- 620	0,1	- 45	0,3	- 52	0,2
Other services	- 2 708	-0,7	- 2 553	-1,3	- 2 569	-1,2
Total	- 5 165	0,0	- 2 878	0,0	- 2 915	0,0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

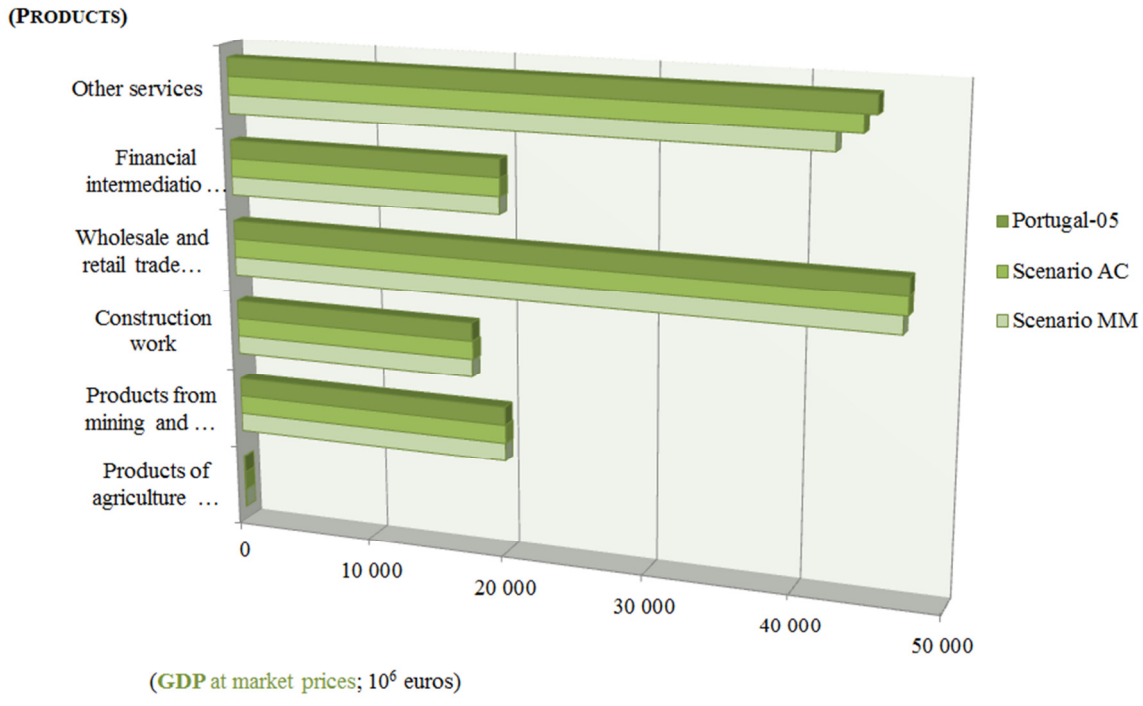
Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 7 (similar tables were constructed for both scenarios).

Chart 20. "Scenarios": Impacts on Domestic Production – Production/Output



Sources: Tables 7 and 21

Chart 21. "Scenarios": Impacts on Domestic Production – GDP at market prices



Sources: Tables 7 and 21

[See Tables 2 and 21 and Charts 20 and 21]

On the supply side, i.e. in terms of production, the repercussions at the level of what is produced are identical, as are the corresponding reflections at the level of gross domestic product (or gross added value – the difference between production and intermediate consumption, plus net taxes on products, in the case of market prices).

Therefore, a reduction of 1385 million euros in the direct taxes paid by households to the government, resulted in reductions of 732 and 2915 million euros in GDP, in Scenario-AC and Scenario-MM, respectively.

This means that, maintaining the same structure for the origin and destination of income, in other words maintaining the structure of income in cash and cash needs, the impact of a shock to income is reflected in the economy as a whole, depending on its relative importance in the institutional balances of the sectors directly affected by that shock. In our experiment, there was a 1% decrease in households' cash needs, which represented a 2% decrease in the government's income in cash. This also meant that households had more income and the government had less income to spend. Due to the characteristics of the underlying algebraic versions, as mentioned above, Scenario-AC shows the impact of this decrease in the government's income on other institutional sectors, except on households, and only the direct impact on households of the (indirect) increase in the households' income. Scenario-MM, in turn, shows the global impacts of the above-mentioned changes in the incomes of the government and households. The size of the impacts arising from the latter scenario shows that the negative global impact of the decrease in the government's income matched the possible positive impact of the (indirect) increase in the households' income.

Therefore, a policy measure that could be thought of as "good" for households, to the extent that it represented an (indirect) increase in its income, turned out to be "bad", not only for households, but also for all the other institutional sectors, or the economy as a whole.

4. Beyond the measured part

A number of important aspects were not described in the above snapshot or in the corresponding scenarios because they were either not measured at all, were poorly measured or were not identified. This is a serious limitation of the work undertaken, and something which the author is determined to improve upon in future research into SAMs based on the SNA.

In this regard, there are some adjustments that could be made to the described cell contents and/or some zero cells could be filled in. This can be done either within and/or outside the scope of the SNA.

a) Within the scope of the SNA, the following topics are examples of rearrangements that could be made to the described cell contents (the described cells can be identified in Tables 1 and 2), in order to avoid the existence of negative cells in the SAM. This would help to improve its definition (incomings in rows and outgoings in columns) and facilitate the application of certain balancing methods, whenever necessary.

a.1) Instead of working with net indirect taxes, it is possible to work with taxes and subsidies separately. The taxes on products could be recorded in the above-described cells $t_{dic,p}$ and $t_{rw,p}$ and taxes on production in cells $t_{dic,a}$ and $t_{rw,a}$. The subsidies on products could be recorded in cells $t_{p,dic}$ and $t_{p,rw}$ and subsidies on production in cells $t_{a,dic}$ and $t_{a,rw}$.

a.2) The net lending or borrowing (NLB), which, in the SAM's capital account, is considered as a component of investment funds, not required or required to cover aggregate investment, could be recorded in cells $t_{dik,dif}$, in the case of net borrowing, and in cells $t_{dif,dik}$, in the case of net lending. Thus, if there is net borrowing, we have a financing requirement that is covered by financial transactions (from the rest of the world, since the national funds are not sufficient), i.e. a resource of the capital account (row) and a use of the financial account (column). If there is net lending, we have a financing capacity that will be absorbed by financial transactions (to the rest of the world, since there is an excess of national funds), i.e. a resource of the financial account (row) and a use of the capital account (column).

b) Still working within the scope of the SNA, some new data could be considered, either in addition to other data or as possible replacements for these figures.

b.1) The consumption of fixed capital could be included in $t_{p,dik}$.

b.2) The production of the institutional sectors could be included in $t_{dic,p}$, $t_{dic,a}$, or even $t_{a,dic}$. In the basic structure, production is recorded in cells $t_{a,p}$.

b.3) The intermediate consumption of the institutional sectors could be included in $t_{p,dic}$. In the basic structure, intermediate consumption is recorded in cells $t_{p,a}$.

b.4) The gross capital formation of the institutional sectors could be recorded by activity in $t_{a,dik}$. In the basic structure, gross capital formation is recorded by product in $t_{p,dik}$.

b.5) The financial transactions between institutional sectors could be included, allowing for the disaggregation of $t_{dif,dif}$, $t_{dif,rw}$ and $t_{rw,dif}$. As mentioned above, the "from whom to whom" matrices of these transactions are not usually available; however, some more work needs to be done in order to underline the importance of this information.

c) Outside the scope of the SNA, working either within or outside the framework of the satellite accounts, the inclusion of the following aspects could be considered[12].

c.1) The expansion of the production boundary, for example recording the services that households deliver to themselves, associated or not with a subsistence output. The extension to unpaid household activity is presented by the SNA as an example of satellite accounts (ISWGNA, 2008: 542-543). On the other hand, the SNA dedicates its Chapter 25 to the consideration of informal aspects of the economy (ISWGNA, 2008: 471-482). In these cases, it is suggested that a possible distinction should be made between income in cash and income in kind. The former is already identified in section 3.

c.2) (Re-)analysis of the imputations that were made, their underlying methodologies and their possible adjustments. The output produced for own final use and other non-market output, included in the output of goods and services, is at the top of the author's list of interests. This priority is also influenced by the author's intention to eliminate the assumption adopted in the *master* model that all domestically produced output is market output and her interest in identifying the above-mentioned income in kind.

c.3) The rethinking of the way in which the factors of production are worked upon and the possible consideration of natural resources and their relationship with the society's activity. The extension to environmental accounting is presented by the SNA as an example of satellite accounts (ISWGNA, 2008: 534-538).

c.4) Stocks of capital and wealth.

c.5) Demography and the activity of the population of working age, their time use, skills, etc.

At the level of the *master* model, research will also be undertaken into the flexibility of the fixed parameters and the exogenous variables, as well as into the development of the valuation system, a subject that was first dealt with in Santos, 2009. Such study, supported (or not) by time series for national accounting transactions, will involve the following aspects: calculating marginal propensities and elasticities; attempting to make at least some transactions with the rest of the world endogenous; carrying out tests with structural change; etc.

It is considered that the implementation and study of some of these topics, especially those referred to in subsection c), could become valuable research projects, and, in fact, some of them already

[12] Some of the aspects referred to in this paragraph were also referred to by Pyatt (1991a) when he argued in favour of a radical revision of the 1968 SNA, and by Round (2003) when he discussed the problematic compilation issues under the scope of the 1993 SNA.

form part of the SNA's research agenda. However, the aim here is to identify guidelines for future research and, at the same time, to show that, while the SAM can be a complete and credible measurement tool, it also has great potential for other uses and even more can still be done to improve its usefulness as a working tool to support the policy decision process.

5. Concluding Remarks

A SAM-based approach to the study of the economy incorporates two versions of the SAM: a numerical version that describes the activity of a society empirically and an algebraic version that describes that same activity theoretically. Each cell of the numerical version has a specific numerical value, with the sums of the rows being equal to the sums of the columns. In turn, each cell of the algebraic version contains algebraic expressions that, together with those of all the other cells, make up a SAM-based model, the calibration of which involves a replication of the numerical version.

Having been constructed from the SNA, the numerical version of the SAM presented in this work provided us not only with the data needed to take a snapshot of the reality under study, but also with a consistent database for use in the constructed algebraic versions or SAM-based models – in this case, the study of scenarios based on the use of accounting multipliers and the *master* model.

The existence of many fixed parameters in the *master* model and of fixed average expenditure propensities in the multipliers can be considered to be amongst the SAM's strongest and most limitative assumptions. On the other hand, in the case of accounting multipliers, the origin of the flows in which shocks (representing the effects of policy measures, for instance) can be introduced into the model has to be regarded as exogenous, and therefore, at the level of that account, all that can be measured is the direct influence of that shock, since the global effect of the same shock on the destination account is not considered. This does not happen with the *master* model, in which shocks can be introduced using specific parameters (and exogenous variables) within specific SAM cells and not within SAM accounts. Therefore, more impacts can be measured with the *master* model.

Since our concern was to quantify the effects of policy measures, while also paying close attention to income distribution and redistribution, the accounts of the institutional sectors and their associated transactions assumed a central role. The production and rest of the world accounts were not, however, neglected, but their associated transactions were treated at a different level of specification from the one that is found in models affording them a central role.

An application of a SAM to Portugal in 2005 allowed us to test the reliability of our working tool and to better identify its limitations.

In analysing the constructed numerical version, it was possible to see that the relatively high share of intermediate consumption in the structure of production costs penalises those (institutional and activity) sectors that most contribute to domestic production (in terms of their relative contribution to the gross domestic product), as is the case, for example, with non-financial corporations and industry, including energy. This has obvious repercussions on what is produced, and some care should be taken in dealing with the values calculated at basic and at market prices, since the net taxes on products (the difference between the two) can seriously bias the analysis.

Thus, the snapshot showing who produces and what is produced in the economy can be very different, depending on whether the focus is on domestic production or on the gross domestic product (gross added value). This difference has to do with the structure of production costs and with the greater influence of intermediate consumption in the latter case. On the other hand, the valuation of the gross domestic product can also introduce some differences with the influence of the net taxes on products, which are added to basic prices in order to convert them into market prices.

The destination of domestic production helps to complete the snapshot of the use that is made of products in the economy or abroad (exports). Thus, domestic demand will be partly satisfied by domestic production and partly by imports. In our application, 83% of domestic demand was satisfied by products with a domestic origin, with the remaining 17% being imported goods.

The composition of domestic demand (by institutions and by products) identifies the relative importance of intermediate and final consumption (in terms of both expenditure and actual consumption), as well as of gross capital formation. In our application, the latter accounted for 11% of domestic demand, whereas intermediate and final consumption had shares of 48 and 41%, respectively. Households and non-financial corporations are the relevant institutional sectors in total demand, with the former being more prominent in final consumption and the latter being more prominent in intermediate consumption. The importance of households in domestic demand is even greater if, instead of final consumption expenditure, we consider actual final consumption. It is mainly products originating from industry, including energy, that are most in demand.

The origin, use and distribution of income by institutional sectors is an aspect that can be particularly well described by the SAM. With the national income, representing the compensation of labour (employees), own account labour and capital received by institutional sectors, from the domestic economy and from the rest of the world, and the net indirect taxes, the so-called primary distribution of income is identified. Households are the only recipients of the compensation of

labour (employees). The government, in turn, is the only recipient of the net indirect taxes (taxes on products and production). In our application, 73% of the gross national income belongs to households, with the other two main parts, 13% and 10%, belonging to the government and the non-financial corporations, respectively. Those three positions change to 82%, 14% and 1% respectively, if we consider net national income. The so-called income in cash was calculated by adding to the gross national income the current and capital transfers received by the institutional sectors. In our application, 61% of the total income in cash is gross national income, with 35% and 4% being the shares of current and capital transfers, respectively. Households have a share of 59% of income in cash, 75% of which originates in the gross national product and 23% in current transfers. The government has the second most important share, being represented by 27% of the income in cash, 64% of which originates in current transfers and 26% in the gross national product (net indirect taxes). The other three institutional sectors have less important positions, with the non-financial corporations having only 8% of the total income in cash.

On the other hand, the so-called cash needs was calculated by adding together current and capital transfers, final consumption expenditure and gross capital formation. In our application, 50% of the total cash needs was for final consumption and 33% for current transfers; gross capital formation represented 13% and capital transfers 3%. In turn, households and the government represent 54% and 29%, respectively, of the cash needs. In the case of households, 67% of income is needed for final consumption expenditure and 27% for current transfers. In the case of the government, those same needs represent 44% and 46%, respectively. Attention is drawn in particular to the position of non-financial corporations, with a share of 11% of cash needs, 67% of which is for gross capital formation. In the gross capital formation of non-financial corporations, 98% of income is used for gross fixed capital formation, 74% of which is used to cover the consumption of fixed capital.

The coverage of the cash needs by income in cash identifies the net lending or borrowing of the institutional sectors and the economy as a whole. In our application, the households, financial corporations and the NPISH have net lending, with the income in cash exceeding the cash needs, by 3%, 6% and 1% respectively. In turn, non-financial corporations and the government have net borrowing, with the cash needs exceeding income in cash by 30% and 12% respectively. Therefore, the economy as a whole is led into a situation of net borrowing, with the total cash needs exceeding 5% of the total income in cash.

The experiment conducted with a 1% reduction in the rate of the direct taxes paid by households to the government directly involved reductions of 1% in the households' cash needs and 2% in the general government's income in cash. The models were then tested with the introduction of a shock of 1385 million euros.

Scenarios AC and MM were generated from the use of accounting multipliers (AC) and the *master* model (MM). Although they have some common assumptions, they are different mainly because AC works with endogenous and exogenous accounts (and fixed average expenditure propensities) while MM works with endogenous and exogenous parameters and variables. Thus, despite the limitations of the fixed parameters and variables of Scenario-MM, when shocks are introduced into certain flows of money, this model can measure (at least in part) effects that are not measured by Scenario-AC. In our experiment, the (current and capital) accounts of the households were set as exogenous in the AC model. Consequently, if we take into account the importance of households in the distribution of income (as identified in the snapshot of "Portugal-05"), this means that important impacts were not measured in Scenario-AC, which explains the lower global impacts of the above-mentioned shock measured by Scenario-AC. In both scenarios, cash needs and income in cash decreased globally, although the effects at the level of net lending and borrowing were more evident and more clearly felt by all the institutional sectors in Scenario-MM. That is why, in Scenario-AC, the net borrowing of the economy as a whole decreases, and in Scenario-MM it increases.

In specifying the impacts on cash needs and income in cash in Scenario-AC, the main emphasis is laid on current transfers paid and received respectively. However, in Scenario-MM, the main emphasis is laid on final consumption and gross national income respectively. These differences tend to confirm the finding that the impacts on households' accounts (and the consequent repercussions on the accounts of the other sectors, namely the government) are not measured in Scenario-AC.

The negative global impacts identified at the level of income have similar repercussions at the levels of demand and production, particularly in the case of the products from mining and quarrying, manufactured products and energy products and other services.

The consequences of the negative global impacts on the GDP caused by a reduction of 1385 million euros in the direct taxes paid by households to the government were obvious, with reductions of 732 and 2915 million euros being recorded in Scenario-AC and Scenario-MM, respectively.

Therefore, a policy measure that could be thought of as "good" for households, to the extent that it represented an (indirect) increase in their income, turned out to be "bad", not only for households, but also for all the other institutional sectors, or for the economy as a whole. This resulted from the fact that the impact of the corresponding decrease in the government's income matched the eventual positive impact of the (indirect) increase in the households' income. Such a situation is more evident in Scenario-MM, which measures more impacts than Scenario-AC, because in Scenario-MM more effects were captured.

Our working tool, namely the Social Accounting Matrix, in both its numerical and algebraic versions, based on the SNA, showed itself to be adequate not only for the study of the realities of countries, but also for the study of possible scenarios resulting from the adoption of policy measures.

However, both within and outside the scope of the SNA, there are important aspects that still need to be studied in greater detail and readjusted. The study of those aspects would improve the numerical version of the SAM proposed in this paper and the possible algebraic versions derived from it, namely the *master* model. The author's research work will therefore continue with the study of the SAM-based approach and its use in defining a suitable framework for explaining the reality of countries and supporting the policy decision process.

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Appendices

Table A.1. Portuguese basic SAM (Social Accounting Matrix) for 2005 (in 10^6 euros)

	p	*a*	f	dic	dik	dif	rw	total
p – products	0	148 312		126 644	33 649		42 567	351 173
a – activities	276 675							276 675
f – factors		129 626					7 822	137 447
dic – (domestic) institutions' current account	20 899	- 854	126 179	78 861			4 603	1 229 688
dik – (domestic) institutions' capital account				19 025	8 174	12 335	2 404	41 937
dif – (domestic) institutions' financial account						37 825	31 113	68 938
rw – rest of the world	53 599	- 409	11 269	5 158	114	18 779		88 509
total	351 173	276 675	137 447	1 229 688	41 937	68 938	88 509	

Source: Integrated Economic Accounts Table for Portugal in 2005 (Appendix A.5).

Table A.2. Portuguese SAM (Social Accounting Matrix) for 2005 (in 10^6 euros)

Outlays (expenditures) / Incomes (receipts)				PRODUCTION																
				PRODUCTS							ACTIVITIES							FACTORS		
				Products of agriculture, hunting, forestry …	Products from mining and quarrying …	Construction work	Wholesale and retail trade services…	Financial intermediation services, real estate…	Other services	Total	Agriculture, hunting and foresty …	Industry, including energy	Construction	Wholesale and retail trade …	Financial, real-estate, renting …	Other service activities	Total	Labour - employees	Own Account Labour and Capital	Total
				1	2	3	4	5	6		7	8	9	10	11	12		13	14	
PRODUCTION	PRODUCTS	Products of agriculture …	1	0	0	0	0	0	0	0	1 041	4 779	0	631	40	176	6 666	0	0	0
		Products from mining and …	2	0	0	0	0	0	0	0	2 038	46 816	8 915	11 595	1 912	5 994	77 270	0	0	0
		Construction work	3	0	0	0	0	0	0	0	93	735	8 729	771	1 010	326	11 663	0	0	0
		Wholesale and retail trade…	4	2 216	22 919	0	-25 139	0	4	0	157	2 285	244	8 232	1 519	2 605	15 043	0	0	0
		Financial intermediation…	5	0	0	0	0	0	0	0	428	5 690	1 236	9 422	12 411	4 528	33 714	0	0	0
		Other services	6	0	0	0	0	0	0	0	33	267	21	464	610	2 560	3 955	0	0	0
		Total		2 216	22 919	0	-25 139	0	4	0	3 790	60 571	19 145	31 115	17 503	16 189	148 312	0	0	0
	ACTIVITIES	Agriculture, hunting and forest	7	6 949	406	16	28	33	0	7 432	0	0	0	0	0	0	0	0	0	0
		Industry, including energy	8	0	81 560	376	704	507	121	83 268	0	0	0	0	0	0	0	0	0	0
		Construction	9	0	72	27 507	127	234	0	27 940	0	0	0	0	0	0	0	0	0	0
		Wholesale and retail trade…	10	0	1 392	184	58 303	2 479	0	62 357	0	0	0	0	0	0	0	0	0	0
		Financial, real-estate, renting ..	11	1	106	73	319	44 556	2	45 057	0	0	0	0	0	0	0	0	0	0
		Other service activities	12	5	211	333	296	2 079	47 698	50 622	0	0	0	0	0	0	0	0	0	0
		Total		6 955	83 747	28 489	59 776	49 888	47 821	276 675	0	0	0	0	0	0	0	0	0	0
	FACTORS	Labour - employees	13	0	0	0	0	0	0	0	826	13 022	6 029	18 325	8 830	28 327	75 358	0	0	0
		Own Account Labour and Capital	14	0	0	0	0	0	0	0	3 482	9 900	2 840	13 271	18 352	6 422	54 267	0	0	0
		Total		0	0	0	0	0	0	0	4 308	22 922	8 869	31 596	27 182	34 749	129 626	0	0	0
INSTITUTIONS	CURRENT ACCOUNT	Households	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75 198	31 058	106 255
		Nonfinancial corporations	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15 009	15 009
		Financial corporations	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4 638	4 638
		Government	18	- 216	13 547	786	2 340	3 596	846	20 899	- 450	- 153	- 50	- 239	252	- 214	- 854	0	- 707	- 707
		Non Profit Institutions Serving Households (NPISH)	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	984	984
		Total		- 216	13 547	786	2 340	3 596	846	20 899	- 450	- 153	- 50	- 239	252	- 214	- 854	75 198	50 981	126 179
	CAPITAL ACCOUNT	Households	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Nonfinancial corporations	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Financial corporations	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Government	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Non Profit Institutions Serving Households (NPISH)	24	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
	FINANCIAL ACCOUNT		25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
REST OF THE WORLD			26	2 220	47 255	- 5	1 606	2 132	391	53 599	- 215	- 73	- 24	- 114	120	- 102	- 409	350	10 919	11 269
TOTAL				11 174	167 468	29 271	38 583	55 615	49 062	351 173	7 432	83 268	27 940	62 357	45 057	50 622	276 675	75 547	61 900	137 447

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

(Integrated Economic Accounts Table (Table A.5); Supply and Use Table; "from whom to whom matrices" for transactions D39 and D5-9 – see Table 2).

Table A.2. Portuguese SAM (Social Accounting Matrix) for 2005 (in 10^6 euros) (continued)

Outlays (expenditures) / Incomes (receipts)				INSTITUTIONS														REST OF THE WORLD	TOTAL
				CURRENT ACCOUNT						CAPITAL ACCOUNT						FINANCIAL ACCOUNT			
				Households	Nonfinancial corporations	Financial corporations	Government	Non Profit Institutions Serving Households (NPISH)	Total	Households	Nonfinancial corporations	Financial corporations	Government	Non Profit Institutions Serving Households (NPISH)	Total				
				15	16	17	18	19		20	21	22	23	24		25	26		
PRODUCTION	PRODUCTS	Products of agriculture …	1	3 670	0	0	0	0	3 670	215	44	0	0	0	259	0	579	11 174	
		Products from mining and …	2	47 418	0	0	1 550	48	49 016	786	8 511	273	861	305	10 735	0	30 445	167 468	
		Construction work	3	116	0	0	0	0	116	5 827	7 313	663	3 448	241	17 491	0	0	29 271	
		Wholesale and retail trade…	4	13 213	0	0	143	0	13 356	109	239	6	5	5	363	0	9 820	38 583	
		Financial intermediation…	5	15 675	0	0	151	150	15 976	1 307	2 888	73	59	56	4 383	0	1 542	55 615	
		Other services	6	11 565	0	0	30 130	2 814	44 509	123	227	21	7	39	417	0	181	49 062	
		Total		91 658	0	0	31 974	3 012	126 644	8 366	19 221	1 037	4 380	645	33 649	0	42 567	351 173	
	ACTIVITIES	Agriculture, hunting and forest	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7 432	
		Industry, including energy	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83 268	
		Construction	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27 940	
		Wholesale and retail trade…	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62 357	
		Financial, real-estate, renting ..	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45 057	
		Other service activities	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50 622	
		Total		0	0	0	0	0	0	0	0	0	0	0	0	0	0	276 675	
	FACTORS	Labour - employees	13	0	0	0	0	0	0	0	0	0	0	0	0	0	189	75 547	
		Own Account Labour and Capital	14	0	0	0	0	0	0	0	0	0	0	0	0	0	7 633	61 900	
		Total		0	0	0	0	0	0	0	0	0	0	0	0	0	7 822	137 447	
INSTITUTIONS	CURRENT ACCOUNT	Households	15	856	1 753	3 466	22 781	20	28 875	0	0	0	0	0	0	0	3 413	138 544	
		Nonfinancial corporations	16	1 745	119	1 013	5	0	2 883	0	0	0	0	0	0	0	84	17 975	
		Financial corporations	17	3 383	1 045	102	20	26	4 577	0	0	0	0	0	0	0	62	9 277	
		Government	18	27 258	4 416	429	7 944	37	40 084	0	0	0	0	0	0	0	1 044	60 466	
		Non Profit Institutions Serving Households (NPISH)	19	946	550	44	873	31	2 443	0	0	0	0	0	0	0	0	3 426	
		Total		34 188	7 882	5 054	31 622	114	78 861	0	0	0	0	0	0	0	4 603	229 688	
	CAPITAL ACCOUNT	Households	20	9 544	0	0	0	0	9 544	0	0	1 929	246	0	2 174	-4 725	152	7 145	
		Nonfinancial corporations	21	0	9 884	0	0	0	9 884	0	0	0	1 361	0	1 361	8 758	630	20 633	
		Financial corporations	22	0	0	4 072	0	0	4 072	0	75	2 195	5	0	2 275	- 681	4	5 670	
		Government	23	0	0	0	-4 775	0	-4 775	122	34	94	1 866	7	2 124	9 023	1 466	7 838	
		Non Profit Institutions Serving Households (NPISH)	24	0	0	0	0	300	300	0	0	57	183	0	240	- 41	152	652	
		Total		9 544	9 884	4 072	-4 775	300	19 025	122	109	4 275	3 661	7	8 174	12 335	2 404	41 937	
	FINANCIAL ACCOUNT		25	0	0	0	0	0	0	0	0	0	0	0	0	37 825	31 113	68 938	
REST OF THE WORLD			26	3 154	209	151	1 644	0	5 158	-1 344	1 303	358	- 203	0	114	18 779		88 509	
TOTAL				138 544	17 975	9 277	60 466	3 426	229 688	7 145	20 633	5 670	7 838	652	41 937	68 938	88 509		

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

(Integrated Economic Accounts Table (in Appendix); Supply and Use Table; "from whom to whom matrices" for transactions D39 and D5-9 – see Table 2).

A.3. Accounting multipliers for Portugal in 2005

Table A.3.1. Average expenditure propensities matrices

	p1	p2	p3	p4	p5	p6	a1	a2	a3	a4	a5	a6	fle	foa	dicnfc	dicfc	**dicg**	dicnp	diknfc	dikfc	dikg	diknp
$A_n = N_* \hat{y}_n^{-1}$																						
p1	0	0	0	0	0	0	0,14	0,06	0	0,01	0	0	0	0	0	0	**0**	0	0	0	0	0
p2	0	0	0	0	0	0	0,27	0,56	0,32	0,19	0,04	0,12	0	0	0	0	**0,03**	0	0,41	0,05	0,11	0,47
p3	0	0	0	0	0	0	0,01	0	0,31	0,01	0,02	0,01	0	0	0	0	**0**	0	0,35	0,12	0,44	0,37
p4	0,20	0,14	0	-0,65	0	0	0,02	0	0	0,13	0,03	0,1	0	0	0	0	**0**	0	0,01	0	0	0,01
p5	0	0	0	0	0	0	0,06	0,1	0	0,15	0,28	0,09	0	0	0	0	**0**	0	0,14	0,01	0,01	0,09
p6	0	0	0	0	0	0	0	0	0	0,01	0,01	0,1	0	0	0	0	**0,50**	0,82	0,01	0	0	0,06
a1	0,62	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
a2	0	0,49	0,01	0,02	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
a3	0	0	0,94	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
a4	0	0,01	0,01	1,51	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
a5	0	0	0,00	0,01	0,80	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
a6	0	0	0,01	0,01	0,04	0,97	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
fle	0	0	0	0	0	0	0,11	0,2	0,2	0,29	0,20	0,56	0	0	0	0	**0**	0	0	0	0	0
foa	0	0	0	0	0	0	0,47	0,1	0,1	0,21	0,41	0,13	0	0	0	0	**0**	0	0	0	0	0
dicnfc	0	0	0	0	0	0	0	0	0	0	0	0	0	0,24	0,01	0,11	**0**	0	0	0	0	0
dicfc	0	0	0	0	0	0	0	0	0	0	0	0	0	0,07	0,06	0	**0**	0	0	0	0	0
dicg	-0,02	0,08	0,03	0,06	0,06	0,02	-0,06	0	0	0	0	0	0	-0,01	0,25	0,05	**0,13**	0	0	0	0	0
dicnp	0	0	0	0	0	0	0	0	0	0	0	0	0	0,02	0,03	0	**0,01**	0	0	0	0	0
diknfc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,55	0	**0**	0	0	0	0,17	0
dikfc	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,44	**0**	0	0	0,39	0	0
dikg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**-0,08**	0	0	0,02	0,24	0,01
diknp	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0,09	0	0,01	0,02	0
$A_1 = L_* \hat{y}_n^{-1}$																						
dich	0	0	0	0	0	0	0	0	0	0	0	0	1	0,50	0,10	0,37	**0,38**	0,01	0	0	0	0
dikh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0,34	0,03	0
dif	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**	0	0	0	0	0
rw	0,20	0,28	0	0,04	0	0,01	-0,03	0	0	0	0	0	0	0,18	0,01	0,02	**0,03**	0	0,06	0,06	-0,03	0
Sum																						
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	**1**	1	1	1	1	1

Source: Table A.1.

Table A. 3.2. Accounting multipliers matrix

	p1	p2	p3	p4	p5	p6	a1	a2	a3	a4	a5	a6	fle	foa	dicnfc	dicfc	**dicg**	dicnp	diknfc	dikfc	dikg	diknp
p1	1,11	0,05	0,03	0,03	0,01	0,01	0,17	0,10	0,03	0,03	0,01	0,01	0,00	0,01	0,02	0,01	**0,007**	0,02	0,04	0,01	0,03	0,04
p2	0,44	1,53	0,72	0,40	0,23	0,26	0,58	0,94	0,74	0,42	0,23	0,26	0,00	0,16	0,57	0,20	**0,120**	0,34	0,93	0,30	0,88	1,03
p3	0,06	0,03	1,44	0,06	0,08	0,03	0,08	0,05	0,47	0,06	0,09	0,04	0,00	0,09	0,29	0,17	**-0,067**	0,08	0,54	0,32	0,98	0,57
p4	0,21	0,17	0,10	0,75	0,06	0,07	0,11	0,14	0,10	0,15	0,06	0,07	0,00	0,02	0,08	0,03	**0,039**	0,08	0,13	0,04	0,12	0,13
p5	0,16	0,15	0,17	0,27	1,37	0,17	0,17	0,20	0,17	0,29	0,42	0,17	0,00	0,06	0,21	0,07	**0,090**	0,23	0,32	0,08	0,21	0,26
p6	0,03	0,11	0,09	0,09	0,12	1,10	0,05	0,09	0,08	0,07	0,09	0,09	0,00	0,07	0,25	0,08	**0,642**	0,94	0,11	0,04	0,10	0,16
a1	0,69	0,04	0,02	0,02	0,01	0,01	1,11	0,06	0,02	0,02	0,01	0,01	0,00	0,00	0,02	0,01	**0,005**	0,01	0,02	0,01	0,02	0,03
a2	0,22	0,75	0,37	0,21	0,13	0,13	0,29	1,46	0,37	0,21	0,12	0,13	0,00	0,08	0,28	0,10	**0,061**	0,17	0,46	0,15	0,45	0,51
a3	0,06	0,03	1,36	0,06	0,08	0,03	0,08	0,05	1,45	0,06	0,09	0,03	0,00	0,08	0,28	0,16	**-0,063**	0,08	0,51	0,30	0,92	0,53
a4	0,33	0,28	0,17	1,14	0,16	0,12	0,18	0,23	0,16	1,24	0,12	0,12	0,00	0,04	0,14	0,05	**0,064**	0,13	0,21	0,07	0,20	0,23
a5	0,13	0,12	0,14	0,22	1,09	0,14	0,14	0,16	0,14	0,23	1,34	0,14	0,00	0,05	0,17	0,05	**0,072**	0,18	0,26	0,07	0,17	0,21
a6	0,04	0,11	0,11	0,11	0,17	1,08	0,05	0,09	0,09	0,09	0,11	1,10	0,00	0,08	0,26	0,08	**0,627**	0,93	0,12	0,05	0,12	0,18
fle	0,27	0,30	0,49	0,49	0,40	0,69	0,29	0,40	0,50	0,51	0,39	0,70	1,00	0,09	0,32	0,12	**0,380**	0,64	0,37	0,15	0,43	0,40
foa	0,49	0,23	0,30	0,39	0,53	0,24	0,66	0,33	0,30	0,41	0,61	0,24	0,00	1,06	0,20	0,07	**0,126**	0,25	0,28	0,10	0,28	0,28
dicnfc	0,12	0,06	0,08	0,10	0,13	0,06	0,17	0,08	0,08	0,10	0,16	0,06	0,00	0,27	1,06	0,13	**0,032**	0,07	0,07	0,03	0,07	0,07
dicfc	0,04	0,02	0,03	0,04	0,05	0,02	0,06	0,03	0,03	0,04	0,06	0,02	0,00	0,10	0,08	1,02	**0,012**	0,03	0,03	0,01	0,03	0,03
dicg	0,03	0,18	0,15	0,13	0,17	0,07	0,04	0,13	0,12	0,09	0,11	0,05	0,00	0,09	0,39	0,12	**1,187**	0,10	0,15	0,05	0,15	0,16
dicnp	0,01	0,01	0,01	0,01	0,02	0,01	0,02	0,01	0,01	0,01	0,02	0,01	0,00	0,03	0,04	0,01	**0,020**	1,02	0,01	0,00	0,01	0,01
diknfc	0,07	0,03	0,04	0,05	0,07	0,03	0,09	0,04	0,04	0,06	0,08	0,03	0,00	0,15	0,58	0,07	**-0,004**	0,03	1,04	0,02	0,27	0,04
dikfc	0,03	0,02	0,02	0,03	0,03	0,02	0,04	0,02	0,02	0,03	0,04	0,02	0,00	0,07	0,06	0,73	**0,008**	0,02	0,02	1,64	0,02	0,02
dikg	0,00	-0,02	-0,01	-0,01	-0,02	-0,01	0,00	-0,01	-0,01	-0,01	-0,01	-0,01	0,00	-0,01	-0,04	0,00	**-0,123**	-0,01	-0,01	0,03	1,30	0,00
diknp	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	**-0,001**	0,09	0,00	0,02	0,03	1,00

Source: Tables A.1 and A.3.1.

A.4. *Master* model - conventions and declarations

***Sets** (set indices: lower-case subscripts)*

p ε Products [products of agriculture, hunting, forestry, fisheries and aquaculture (group 1, **p1**); products from mining and quarrying, manufactured products and energy products (group 2, **p2**); construction work (group 3, **p3**); wholesale and retail trade services, repair services, hotel and restaurant services, transport and communication services (group 4, **p4**); financial intermediation services, real estate, renting and business services (group 5, **p5**); other services (group 6, **p6**)]

***a* ε Activities** [agriculture, hunting and forestry; fishing and operation of fish hatcheries and fish farms (group1, ***a*1**); industry, including energy (group 2, ***a*2**); construction (group 3, ***a*3**); wholesale and retail trade, repair of motor vehicles and household goods, hotels and restaurants; transport and communications (group 4, ***a*4**); financial, real-estate, renting and business activities (group 5, ***a*5**); other service activities (group 6, ***a*6**)]

f ε Factors of production

- Labour – employees (**fle**)
- Own account labour and capital (**foa**)

di **ε Domestic Institutions**

- **dic** (current account of di) [households (**dich**); non-financial corporations (**dicnfc**); financial corporations (**dicfc**); general government (**dicg**); non-profit institutions serving households (**dicnp**-NPISHs)]
- **dik** (capital account of di) [households (**dikh**), non-financial corporations (**diknfc**), financial corporations (**dikfc**), general government (**dikg**), and non-profit institutions serving households (**diknp**-NPISHs)]
- **dif** (financial account of di)

rw ε rest of the world

In variables and parameters with **two indices**, the **first** represent the **row** and the **second** the **column accounts** (both indices may be equal).

***Parameters** (lower-case, italics)*

α .. share of the production of each group of activities in the value of production of each group of products

β .. proportion of gross added value in the value of production of each group of activities

γ ..	proportion of intermediate consumption in the value of production of each group of activities
adv..	share of the value of acquisitions less disposals of valuables of each group of products by each group of domestic institutions in the total value of acquisitions less disposals of valuables by these institutions
advc ..	coefficient of acquisitions less disposals of valuables: amount expended by each group of domestic institutions on acquisitions less disposals of valuables per unit of gross saving
apc ..	average propensity to consume of each group of domestic institutions: amount of final consumption per unit of (gross) disposable income
cf..	share of compensation of factors received by domestic institutions
cgfcf ..	rate of coverage of gross fixed capital formation of each group of domestic institutions by investment grants received by these institutions
chinv ..	share of the value of changes in inventories of each group of products by each group of domestic institutions in the total value of changes in inventories of that group of products
chinvc ..	coefficient of changes in inventories: amount of change in inventories of each group of products per unit of supply
dbs..	share of compensation of factors (compensation of employees, gross operating surplus and gross mixed income) in the gross added value
d5s ..	share of current tax on income, wealth, etc. paid by each group of domestic institutions to each group of domestic institutions (Portuguese general government), in the total of current tax on income, wealth, etc. paid by the former
d5rws..	share of current tax on income, wealth, etc. paid by each group of domestic institutions to the rest of the world in the total of current tax on income, wealth, etc. paid by the former
d61s ..	share of social contributions paid by each group of domestic institutions to each group of domestic institutions in the total of social contributions paid by the former
d61rws..	share of social contributions paid by each group of domestic institutions to the rest of the world in the total of social contributions paid by the former
d62s ..	share of social benefits other than social transfers in kind paid by each group of domestic institutions to each group of domestic institutions in the total of social benefits other than social transfers in kind paid by the former

d62rws.. share of social benefits other than social transfers in kind paid by each group of domestic institutions to the rest of the world in the total of social benefits other than social transfers in kind paid by the former

d7 .. share of other current transfers paid by each group of domestic institutions to each group of domestic institutions in the total of other current transfers paid by the former

d7rws .. share of other current transfers paid by each group of domestic institutions to the rest of the world in the total of social benefits other than social transfers in kind paid by the former

d91 .. share of capital taxes paid by each group of domestic institutions (households) to each group of domestic institutions (Portuguese general government) in the total of capital taxes paid by the former

d92.. share of investment grants paid by each group of domestic institutions (Portuguese general government) to each group of domestic institutions in the total of investment grants received by the latter

d92rw.. share of investment grants paid by the rest of the world to each group of domestic institutions in the total of investment grants received by the latter

d99.. share of other capital transfers paid by each group of domestic institutions to each group of domestic institutions in the total of other capital transfers received by the latter

d99rw.. share of other capital transfers paid by the rest of the world to each group of domestic institutions in the total of other capital transfers received by the latter

fcs .. proportion of expenditure on final consumption in each group of products in the total value of the final consumption of each group of domestic institutions

fcsrw .. proportion of expenditure on final consumption in the rest of the world in the total value of the final consumption of each group of domestic institutions

gfcf .. share of the value of gross fixed capital formation in each group of products by each group of domestic institutions in the total value of gross fixed capital formation by these institutions

icp .. coefficient of the intermediate consumption of products: proportion of intermediate consumption of each group of products per unit of intermediate consumption of each group of activities

ntag .. share of net taxes on production paid by each group of activities and received by domestic institutions (Portuguese general government)

ntarw .. share of net taxes on production paid by each group of activities and received by the rest of the world (European Union institutions)

ntpg .. share of net taxes on each group of products received by domestic institutions (Portuguese general government)

ntprw .. share of net taxes on each group of products received by the rest of the world (European Union institutions)

sc .. social contribution rate: social contributions paid by domestic institutions, per unit of received gross national income

si .. saving identity special

ti .. rate of direct taxes: current taxes on income, wealth, etc. paid by domestic institutions, per unit of received aggregate income

tk .. rate of capital tax levied on other capital transfers received by domestic institutions

tmr .. rate of trade and transport margins on each group of domestically transacted products: amount of trade and transport margins per unit of value of domestically transacted products

tp .. (net) tax rate on each group of products: amount of (net) taxes on products per unit of the value of domestically transacted products

Exogenous variables ***(upper-case, at least the first letter, italics)***

CFR.. compensation of the factors of production received from the rest of the world

CFS.. compensation of the factors of production sent to the rest of the world

D5RW .. current taxes on income, wealth, etc. (transaction D5 of the National Accounts) received by domestic institutions from the rest of the world

D61RW .. social contributions (transaction D61 of the National Accounts) received by domestic institutions from the rest of the world

D62P .. social benefits other than social transfers in kind (transaction D62 of the National Accounts) paid by domestic institutions

D62RW .. social benefits other than social transfers in kind (transaction D62 of the National Accounts) received by domestic institutions from the rest of the world

D7P .. other current transfers (transaction D7 of the National Accounts) paid by domestic institutions

D7RW .. other current transfers (transaction D7 of the National Accounts) received by domestic institutions from the rest of the world

D8 .. adjustment made for the change in the net equity of households in pension fund reserves (transaction D8 of the National Accounts)

D92P .. investment grants (transaction D92 of the National Accounts) paid by domestic institutions (Portuguese general government) to the rest of the world

D99P .. other capital transfers (transaction D99 of the National Accounts) paid by domestic institutions to the rest of the world

D99R .. other capital transfers (transaction D99 of the National Accounts) received by domestic institutions

EX .. value of exports (transaction P6 of the National Accounts, at f.o.b. prices)

FT .. financial transactions (transactions F1 to F7 of the National Accounts), except those received from the rest of the world

IM .. value of imports (transaction P7 of the National Accounts, at c.i.f. prices)

K2 .. acquisitions less disposals of non-financial non-produced assets (transaction K2 of the National Accounts)

NTAA .. net taxes on production paid by each group of activities

P51 .. value of gross fixed capital formation (transaction P51 of the National Accounts)

Endogenous variables *(upper-case, at least the first letter, normal)*

AD .. value of aggregate demand (at market prices)

AFIP .. aggregate factors income (paid)

AFIR .. aggregate factors income (received)

AI .. aggregate income (received)

AINV .. aggregate investment

AIP .. aggregate income (paid)

AS .. aggregate supply (value at market prices)

CT .. current transfers

CTP .. (total) current transfers paid by each group of domestic institutions to (all) domestic institutions

CTR .. (total) current transfers received by each group of domestic institutions from (all) domestic institutions

DI .. (gross) disposable income

Didi .. percentage of gross disposable income received by domestic institutions

Digav .. percentage of income generated by the factors production

Digni.. percentage of generated income (gross national income) received by domestic institutions

DT.. value of domestically transacted products, at basic-c.i.f. prices

DTmp .. value of domestically transacted products, at market prices

D5 .. current taxes on income, wealth, etc. (transaction D5 of the National Accounts)

D61 .. social contributions (transaction D61 of the National Accounts)

D91P .. capital taxes (transaction D91 of the National Accounts) paid by domestic institutions

D92R .. investment grants (transaction D92 of the National Accounts) received by domestic institutions

FC .. value of final consumption (transaction P3 of the National Accounts), at market prices

FTRW .. financial transactions (transactions F1 to F7 of the National Accounts) received by domestic institutions from the rest of the world

GAV .. gross added value, at factor cost

GCF .. value of gross capital formation (transaction P5 of the National Accounts), at market prices

GDP.. gross domestic product, at market prices

GNI .. gross national income, at factor cost

GNIMP.. gross national income, at market prices

INVF .. investment funds

KT .. capital transfers

KTP .. (total) capital transfers paid by each group of domestic institutions to (all) domestic institutions

KTR .. (total) capital transfers received by each group of domestic institutions from (all) domestic institutions

NLB .. net lending / borrowing

NTA .. net taxes on production (transaction D29-D39 of the National Accounts)

NTP .. net taxes on products (transaction D21-D31 of the National Accounts)

P52 .. value of changes in inventories (transaction P52 of the National Accounts)

P53 .. value of acquisitions less disposals of valuables (transaction P53 of the National Accounts)

S .. gross saving

TFTP .. total financial transactions (paid)

TFTR .. total financial transactions (received)

TM.. trade and transport margins on transacted products p

TMP.. trade and transport margins on transacted products p - total

TVRWP .. value of transactions to the rest of the world

TVRWR .. transactions value from the rest of the world

UdiFC .. percentage of gross disposable income used in final consumption by domestic institutions

UdiS .. percentage of gross disposable income used in (gross) saving by domestic institutions

VCT .. value of total costs (at basic prices)

VIC .. value of intermediate consumption (transaction P2 of the National Accounts) at market prices

VP .. value of production (transaction P1 of the National Accounts), at basic prices

VPT.. total production value (at basic prices)

Table A.5. Integrated Economic Accounts Table for Portugal in 2005 (in 10^6 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	55 774	55 774								P.7	Imports of goods and services
	42 567		42 567							P.6	Exports of goods and services
	276 675	276 675								P.1	Output of goods and services
	148 312			148 312	3 708	19 847	6 316	4 635	113 807	P.2	Intermediate consumption
	20 761	20 761								D.21-D.31	Net taxes on products
	149 123			**149 123**	**2 573**	**26 661**	**23 962**	**8 221**	**66 946**	**B.1g/B.1*g**	**Gross added value/gross domestic product**
	24 753			24 753	556	6 807	2 622	588	14 181	K.1	Consumption of fixed capital
	124 370			**124 370**	**20 761**	**2 017**	**19 854**	**21 341**	**7 633**	**B.1n/B.1***	**Value added, net/Net domestic product**
	13 207		**13 207**							**B.11**	**External balance of goods and services**
II.1.1. Generation of income account	75 547		189	75 358	2 086	4 297	21 541	3 642	43 792	D.1	Compensation of employees
	19 498			19 498	- 42	- 225	- 131	- 4	- 860	D.2-D.3	Net taxes on production and imports
	20 761			20 761						D.21-D.31	Net taxes on products
	- 1 263			- 1 263	- 42	- 225	- 131	- 4	- 860	D.29-D.39	Net taxes on production
	31 678			**31 678**	**529**		**2 552**	**4 583**	**24 014**	**B.2g**	**Gross operating surplus**
	22 589			**22 589**		**22 589**				**B.3g**	**Gross mixed income**
	13 732			**13 732**	**- 27**		**- 70**	**3 995**	**9 833**	**B.2n**	**Net operating surplus**
	15 783			**15 783**		**15 783**				**B.3n**	**Net mixed income**
II.1.2. Allocation of primary income account	40 424		7 633	32 791	128	2 239	4 119	12 541	13 764	D.4	Property income
										P.119	Adjustment to the FISIM (Financial Intermediation Services Indirectly Measured)
	146 224			**146 224**	**984**	**106 255**	**19 339**	**4 638**	**15 009**	**B.5g**	**Gross national income/ Gross balance of primary incomes**
	121 470			**121 470**	**428**	**99 448**	**16 717**	**4 050**	**828**	**B.5n**	**Net national income/ Net balance of primary incomes**
II.2. Secondary distribution income account	12 594		29	12 566	2	8 275		391	3 897	D.5	Current taxes on income, wealth, etc
	23 154		98	23 056		23 056				D.61	Social contributions
	26 040		34	26 005	20	51	22 250	1 932	1 753	D.62	Social benefits other than social transfers in kind
	23 962		4 442	19 520	92	3 924	11 017	2 047	2 441	D.7	Other current transfers
	147 706			**147 706**	**3 312**	**102 404**	**27 199**	**4 907**	**9 884**	**B.6g**	**Gross disposable income**
	122 953			**122 953**	**2 756**	**95 597**	**24 577**	**4 319**	**- 4 297**	**B.6n**	**Net disposable income**
II.3. Redistribution of income in kind account	22 133			22 133	3 012		19 121			D.63	Social transfers in kind
	147 706			**147 706**	**300**	**124 537**	**8 078**	**4 907**	**9 884**	**B.7g**	**Gross adjusted disposable income**
	122 953			**122 953**	**- 256**	**117 730**	**5 456**	**4 319**	**- 4 297**	**B.7n**	**Net adjusted disposable income**
II.4. Use of income account	**147 706**			**147 706**	**3 312**	**102 404**	**27 199**	**4 907**	**9 884**	**B.6g**	**Gross disposable income**
	122 953			**122 953**	**2 756**	**95 597**	**24 577**	**4 319**	**- 4 297**	**B.6n**	**Net disposable income**
	128 681			128 681		115 828	12 853			P.4	Actual Final Consumption
	128 681			128 681	3 012	93 695	31 974			P.3	Final consumption expenditure
	835			835				835		D.8	Adjustment for the change in the net equity of households in pension funds reserves
	19 025			**19 025**	**300**	**9 544**	**- 4 775**	**4 072**	**9 884**	**B.8g**	**Gross saving**
	- 5 728			**- 5 728**	**- 256**	**2 737**	**- 7 397**	**3 484**	**- 4 297**	**B.8n**	**Net saving**
	14 624		**14 624**							**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.8g**	**Gross saving**
										B.8n	**Net saving**
										B.12	**Current external balance**
										D.9	Capital transfers, receivable
										D.9	Capital transfers, payable (-)
	8 896		**12 383**	**- 3 487**	**130**	**4 848**	**- 7 500**	**1 488**	**- 2 452**	**B.10.1**	**Changes in net worth due to saving and capital transfers**
III.1.2 Acquisitions of non-financial assets account	33 098			33 098	569	8 252	4 374	1 002	18 901	P.51	Gross fixed capital formation
	- 24 753			- 24 753	- 556	- 6 807	- 2 622	- 588	- 14 181	K.1	Consumption of fixed capital (-)
	382			382		63			318	P.52	Changes in inventories
	170			170	77	51	6	35	1	P.53	Acquisitions less disposals of valuables
			49	- 49		- 1 437	- 236	358	1 266	K.2	Acquisitions less disposals of non-produced non-financial assets
			12 335	**- 12 335**	**41**	**4 725**	**- 9 023**	**681**	**- 8 758**	**B.9**	**Net lending (+) /borrowing (-)**

			S.2	S.1	S.15 + S.14	S.13	S.12	S.11		
III.2 Financial account	87 810		31 113	56 697	15 454	579	34 233	6 431		Net acquisition of financial assets\
										Net incurrence of liabilities
			507	- 507			- 507		F.1	Monetary gold and SDRs
	20 302		9 172	11 130	991	880	5 039	4 220	F.2	Currency and deposits
	25 430		10 148	15 282	88	520	15 768	- 1 094	F.3	Securities other than shares
	18 095		3 859	14 236	4	281	12 267	1 684	F.4	Loans
	17 890		7 427	10 463	6 589	- 523	2 948	1 449	F.5	Shares and other equity
	8 132		11	8 121	7 842	2	82	195	F.6	Insurance technical reserves
	- 2 039		- 11	- 2 028	- 60	- 581	- 1 364	- 23	F.7	Other accounts receivable/payable
									B.9 F	**Net lending (+) /borrowing (-)**
										Statistical discrepancy

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

Table A.5. Integrated Economic Accounts Table for Portugal in 2005 (in 10^6 Euros) (continued)

Current accounts

Resources

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
P.7	Imports of goods and services							55 774		55 774	I. Production / external account of goods and services
P.6	Exports of goods and services								42 567	42 567	
P.1	Output of goods and services	180 752	12 856	30 278	46 508	6 282	276 675			276 675	
P.2	Intermediate consumption								148 312	148 312	
D.21-D.31	Net taxes on products						20 761			20 761	
B.1g/B.1*g	**Gross added value/gross domestic product**	**66 946**	**8 221**	**23 962**	**26 661**	**2 573**	**149 123**			**149 123**	II.1.1. Generation of income account
K.1	Consumption of fixed capital										
B.1n/B.1*	**Value added, net/Net domestic product**	**7 633**	**21 341**	**19 854**	**2 017**	**20 761**	**124 370**			**124 370**	
B.11	**External balance of goods and services**							**13 207**		**13 207**	
D.1	Compensation of employees				75 198		75 198	350		75 547	II.1.2. Allocation of primary income account
D.2-D.3	Net taxes on production and imports			20 045			20 045	- 547		19 498	
D.21-D.31	Net taxes on products			20 899			20 899	- 139		20 761	
D.29-D.39	Net taxes on production			- 854			- 854	- 409		- 1 263	
B.2g	**Gross operating surplus**	**24 014**	**4 583**	**2 552**		**529**	**31 678**			**31 678**	
B.3g	**Gross mixed income**				**22 589**		**22 589**			**22 589**	
B.2n	**Net operating surplus**	**9 833**	**3 995**	**- 70**		**- 27**	**13 732**			**13 732**	
B.3n	**Net mixed income**				**15 783**		**15 783**			**15 783**	
D.4	Property income	4 759	12 595	861	10 707	582	29 505	10 919		40 424	
P.119	Adjustment to the FISIM (Financial Intermediation Services Indirectly Measured)		- 3 688								
B.5g	**Gross national income/ Gross balance of primary incomes**	**15 009**	**4 638**	**19 339**	**106 255**	**984**	**146 224**			**146 224**	II.2. Secondary distribution income account
B.5n	**Net national income/ Net balance of primary incomes**	**828**	**4 050**	**16 717**	**99 448**	**428**	**121 470**			**121 470**	
D.5	Current taxes on income, wealth, etc			12 574			12 574	20		12 594	
D.61	Social contributions	1 753	2 589	18 697	51	20	23 109	45		23 154	
D.62	Social benefits other than social transfers in kind				25 910		25 910	129		26 040	
D.7	Other current transfers	1 214	2 050	9 857	5 492	2 423	21 036	2 926		23 962	
B.6g	**Gross disposable income**	**9 884**	**4 907**	**27 199**	**102 404**	**3 312**	**147 706**			**147 706**	II.3. Redistribution of income in kind account
B.6n	**Net disposable income**	**- 4 297**	**4 319**	**24 577**	**95 597**	**2 756**	**122 953**			**122 953**	
D.63	Social transfers in kind				22 133		22 133			22 133	
B.7g	**Gross adjusted disposable income**	**9 884**	**4 907**	**8 078**	**124 537**	**300**	**147 706**			**147 706**	II.4. Use of income account
B.7n	**Net adjusted disposable income**	**- 4 297**	**4 319**	**5 456**	**117 730**	**- 256**	**122 953**			**122 953**	
B.6g	**Gross disposable income**	**9 884**	**4 907**	**27 199**	**102 404**	**3 312**	**147 706**			**147 706**	
B.6n	**Net disposable income**	**- 4 297**	**4 319**	**24 577**	**95 597**	**2 756**	**122 953**			**122 953**	
P.4	Actual Final Consumption								128 681	128 681	
P.3	Final consumption expenditure								128 681	128 681	
D.8	Adjustment for the change in the net equity of households in pension funds reserves				835		835			835	
B.8g	**Gross saving**										
B.8n	**Net saving**										
B.12	**Current external balance**										

Accumulation accounts

Changes in liabilities and net worth

B.8g	**Gross saving**	**9 884**	**4 072**	**- 4 775**	**9 544**	**300**	**19 025**			**19 025**	III.1.1. Change in net worth due to saving and capital transfers account
B.8n	**Net saving**	**- 4 297**	**3 484**	**- 7 397**	**2 737**	**- 256**	**- 5 728**			**- 5 728**	
B.12	**Current external balance**							**14 624**		**14 624**	
D.9	Capital transfers, receivable	1 991	2 279	3 589	2 326	392	10 578	162		10 740	
D.9	Capital transfers, payable (-)	- 146	- 4 275	- 3 693	- 216	- 7	- 8 336	- 2 404		- 10 740	
B.10.1	**Changes in net worth due to saving and capital transfers**	**- 2 452**	**1 488**	**- 7 500**	**4 848**	**130**	**- 3 487**	**12 383**		**8 896**	III.1.2 Acquisitions of non-financial assets account
P.51	Gross fixed capital formation								33 098	33 098	
K.1	Consumption of fixed capital (-)										
P.52	Changes in inventories								382	382	
P.53	Acquisitions less disposals of valuables								170	170	
K.2	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	14 850	33 798	9 604	10 686	68 938	18 872		87 810	
F.1	Monetary gold and SDRs									
F.2	Currency and deposits		16 393	538		16 931	3 371		20 302	
F.3	Securities other than shares	5 328	- 4 490	10 313	- 65	11 086	14 344		25 430	
F.4	Loans	5 731	3 285	- 174	11 627	20 469	- 2 373		18 096	
F.5	Shares and other equity	6 178	9 762			15 940	1 949		17 889	
F.6	Insurance technical reserves	- 101	8 151			8 050	82		8 132	
F.7	Other accounts receivable/payable	- 2 286	697	- 1 073	- 876	- 3 538	1 499		- 2 039	
B.9 F	**Net lending (+) /borrowing (-)**	**- 8 419**	**435**	**- 9 025**	4 768	**- 12 241**	**12 241**			
	Statistical discrepancy	339	- 246	- 2	2	94	- 94			

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

A.6. "Portugal-05"- Snapshot Details

Table A.6.1. "Portugal-05": Origin and distribution of the disposable income

	Gross National Income (10^6 euros)	Current Transfers (10^6 euros)			Disposable income	
		Received	Paid	Net	10^6 euros	%
Institutions						
Households	106 255	32 288	37 342	- 5 054	101 202	69
Nonfinancial corporations	15 009	2966,4	8091,1	- 5 125	9 884	7
Financial corporations	4 638	4639	5204,9	- 566	4 072	3
Government	19 338	41127,5	33266,8	7 861	27 199	19
NPISH	984	2442,8	114,1	2 329	3 312	2
Total	146 223	83 464	84 019	- 555	145 669	100

Source: Table A.2.

Table A.6.2. "Portugal-05": Origin and distribution of the income available for consumption and investment

	Disposable income (10^6 euros)	Capital Transfers (10^6 euros)			Income available to consume and invest	
		Received	Paid	Net	10^6 euros	%
Institutions						
Households	101 202	2 326	- 1 222	3 548	104 750	71
Nonfinancial corporations	9 884	1 991	1 412	579	10 463	7
Financial corporations	4 072	2 279	4 633	- 2 354	1 718	1
Government	27 199	3 590	3 457	132	27 331	18
NPISH	3 312	392	7	386	3 698	2
Total	145 669	10 578	8 288	2 290	147 959	100

Source: Table A.2.

Note: Income available for consumption and investment = income in cash + current transfers (paid) + capital transfers (paid)

Table A.6.3. "Portugal-05": Net fixed capital formation

	Gross Fixed Capital Formation		Consumption of Fixed Capital		Net Fixed Capital Formation		Gross Capital Formation		
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	%
Institutions									
Households	8 252	99	6 807	81	1 445	17	8 366	100	25
Nonfinancial corporations	18 901	98	14 181	74	4 720	25	19 221	100	57
Financial corporations	1 002	97	588	57	414	40	1 037	100	3
Government	4 374	100	2 622	60	1 753	40	4 380	100	13
NPISH	569	88	556	86	13	2	645	100	2
Total	33 098	98	24 753	74	8 345	25	33 649	100	100

Sources: Tables A.2 e A.5.

Table A.6.4. "Portugal-05": Institutional balance of nonfinancial corporations

	Resources, Receipts,Changes in Liabilities and net Worth				Uses, Expenditure,Changes in Assets				Balance	
	[SAM row(f)]	10^6 euros	(%)(d)	(%) (e)	[SAM column(f)]	10^6 euros	(%)(d)	(%) (e)	10^6 euros	(%) (e)
1. Current Account (a)		17 975	90	8		8 091	28	4	9 884	52
	Gross National Income at factor cost	15 009	75	12						
	Current transfers from domestic institutions	2 883	14	4	Current transfers to domestic institutions	7 882	27	10		
	Current transfers from the RW	84	0	2	Current transfers to the RW	209	1	4		
2. Capital Account		1 991	10	19		20 633	72	49	- 18 642	59
					Gross Capital Formation	19 221	67	57		
	Capital transfers from domestic institutions	1 361	7	17	Capital transfers to domestic institutions	109	0	1		
	Capital transfers from the RW	630	3	26	Capital transfers to the RW	1 303	5	1146		
3 = 1 + 2 (b)		19 966	100	8		28 724	100	11	- 8 758	71
Production Account (c)	Production	180 752	---	65	Intermediate Consumption	113 807	---	77	66 946	52
Financial Account (g)		15 189	100	22		6 431	100	11	8 758	71
	Monetary gold and SDRs; Currency and deposits	0	0	0	Monetary gold and SDRs; Currency and deposits	4 220	66	40		
	Securities other than shares	5 328	35	48	Securities other than shares	- 1 094	-17	-7		
	Loans	5 731	38	28	Loans	1 684	26	12		
	Shares and other equity	6 178	41	39	Shares and other equity	1 449	23	14		
	Insurance technical reserves	- 101	-1	-1	Insurance technical reserves	195	3	2		
	Other accounts receivable/payable	- 2 286	-15	65	Other accounts receivable/payable	- 23	0	1		
	Statistical discrepancy	339	2	363						

Sources: Table A.2 (rows/columns 16 and 21); Table A.5 (column S.11)

(a) Balance = Gross saving.
(b) Resources..= Income in Cash; Uses,..= Cash Needs; Balance = Net lending (+)/borrowing (-).
(c) Balance = Gross Domestic Product at basic prices.
(d) Regarding the total of the institution.
(e) Regarding the total of all institutions.
(f) In the case of current and capital accounts.
(g) Balance = Net lending (-)/borrowing (+).

Table A.6.5. "Portugal-05": Institutional balance of financial corporations

	Resources, Receipts,Changes in Liabilities and net Worth				Uses, Expenditure,Changes in Assets				Balance	
	[SAM row(f)]	10^6 euros	(%)(d)	(%) (e)	[SAM column(f)]	10^6 euros	(%)(d)	(%) (e)	10^6 euros	(%) (e)
1. Current Account (a)		9 277	80	4		5 205	48	2	4 072	21
	Gross National Income at factor cost	4 638	40	4						
	Current transfers from domestic institutions	4 577	40	6	Current transfers to domestic institutions	5 054	46	6		
	Current transfers from the RW	62	1	1	Current transfers to the RW	151	1	3		
2. Capital Account		2 279	20	22		5 670	52	14	- 3 391	11
					Gross Capital Formation	1 037	10	3		
	Capital transfers from domestic institutions	2 275	20	28	Capital transfers to domestic institutions	4 275	39	52		
	Capital transfers from the RW	4	0	0	Capital transfers to the RW	358	3	315		
3 = 1 + 2 (b)		11 556	100	5		10 875	100	4	681	-6
Production Account (c)	Production	12 856	---	5	Intermediate Consumption	4 635	---	3	8 221	6
Financial Account (g)		33 552	100	49		34 233	100	60	- 681	-6
	Monetary gold and SDRs; Currency and deposits	16 393	49	97	Monetary gold and SDRs; Currency and deposits	4 532	13	43		
	Securities other than shares	- 4 490	-13	-41	Securities other than shares	15 768	46	103		
	Loans	3 285	10	16	Loans	12 267	36	86		
	Shares and other equity	9 762	29	61	Shares and other equity	2 948	9	28		
	Insurance technical reserves	8 151	24	101	Insurance technical reserves	82	0	1		
	Other accounts receivable/payable	697	2	-20	Other accounts receivable/payable	- 1 364	-4	67		
	Statistical discrepancy	- 246	-1	-263						

Sources: Table A.2 (rows/columns 17 and 22); Table A.5 (column S.12)

(a) Balance = Gross saving.
(b) Resources..= Income in Cash; Uses,..= Cash Needs; Balance = Net lending (+)/borrowing (-).
(c) Balance = Gross Domestic Product at basic prices.
(d) Regarding the total of the institution.
(e) Regarding the total of all institutions.
(f) In the case of current and capital accounts.
(g) Balance = Net lending (-)/borrowing (+).

Table A.6.6. "Portugal-05": Institutional balance of non-profit institutions serving households

	Resources, Receipts,Changes in Liabilities and net Worth				Uses, Expenditure,Changes in Assets				Balance	
	[SAM row(f)]	10^6 euros	(%)(d)	(%) (e)	[SAM column(f)]	10^6 euros	(%)(d)	(%) (e)	10^6 euros	(%) (e)
1. Current Account (a)		3 426	90	1		3 126	83	1	300	2
	Gross National Income at factor cost	984	26	1	Final Consumption	3 012	80	2		
	Current transfers from domestic institutions	2 443	64	3	Current transfers to domestic institutions	114	3	0		
	Current transfers from the RW	0	0	0	Current transfers to the RW	0	0	0		
2. Capital Account		392	10	4		652	17	2	- 260	1
					Gross Capital Formation	645	17	2		
	Capital transfers from domestic institutions	240	6	3	Capital transfers to domestic institutions	7	0	0		
	Capital transfers from the RW	152	4	6	Capital transfers to the RW	0	0	0		
3 = 1 + 2 (b)		3 819	100	2		3 778	100	1	40	0
Production Account (c)	Production	6 282	---	2	Intermediate Consumption	3 708	---	3	2 573	2
Financial Account (g) (with households)										
	Monetary gold and SDRs; Currency and deposits				Monetary gold and SDRs; Currency and deposits					
	Securities other than shares				Securities other than shares					
	Loans				Loans					
	Shares and other equity				Shares and other equity					
	Insurance technical reserves				Insurance technical reserves					
	Other accounts receivable/payable				Other accounts receivable/payable					

Sources: Table A.2 (rows/columns 19 and 24); Table A.5 (column S.15)

(a) Balance = Gross saving.
(b) Resources..= Income in Cash; Uses,..= Cash Needs; Balance = Net lending (+)/borrowing (-).
(c) Balance = Gross Domestic Product at basic prices.
(d) Regarding the total of the institution.
(e) Regarding the total of all institutions.
(f) In the case of current and capital accounts.
(g) Balance = Net lending (-)/borrowing (+).

Table A.6.7. "Portugal-05": Institutional balance of domestic Institutions (total)

	Resources, Receipts,Changes in Liabilities and net Worth				Uses, Expenditure,Changes in Assets				Balance	
	[SAM row(f)]	10^6 euros	(%)(d)	(%) (e)	[SAM column(f)]	10^6 euros	(%)(d)	(%) (e)	10^6 euros	(%) (e)
1. Current Account (a)		229 688	96	100		210 663	83	100	19 025	100
	Gross National Income at factor cost	126 179	53	100	Final Consumption	126 644	50	100		
	Net taxes on production	- 854	0	100						
	Net taxes on products	20 899	9	100						
	Current transfers from domestic institutions	78 861	33	100	Current transfers to domestic institutions	78 861	31	100		
	Current transfers from the RW	4 603	2	100	Current transfers to the RW	5 158	2	100		
2. Capital Account		10 578	4	100		41 937	17	100	- 31 359	100
					Gross Capital Formation	33 649	13	100		
	Capital transfers from domestic institutions	8 174	3	100	Capital transfers to domestic institutions	8 174	3	100		
	Capital transfers from the RW	2 404	1	100	Capital transfers to the RW	114	0	100		
3 = 1 + 2 (b)		240 266	100	100		252 600	100	100	- 12 335	100
Production Account (c)	Production	276 675	---	100	Intermediate Consumption	148 312	---	100	128 363	100
Financial Account (g)		69 031	100	100		56 697	100	100	12 335	100
	Monetary gold and SDRs; Currency and deposits	16 931	25	100	Monetary gold and SDRs; Currency and deposits	10 623	19	100		
	Securities other than shares	11 086	16	100	Securities other than shares	15 282	27	100		
	Loans	20 469	30	100	Loans	14 236	25	100		
	Shares and other equity	15 940	23	100	Shares and other equity	10 463	18	100		
	Insurance technical reserves	8 050	12	100	Insurance technical reserves	8 121	14	100		
	Other accounts receivable/payable	- 3 538	-5	100	Other accounts receivable/payable	- 2 028	-4	100		
	Statistical discrepancy	93	0	100						

Sources: Tables A.2 and A.5.

(a) Balance = Gross saving.
(b) Resources..= Income in Cash; Uses,..= Cash Needs; Balance = Net lending (+)/borrowing (-).
(c) Balance = Gross Domestic Product at basic prices.
(d) Regarding the total of the institution.
(e) Regarding the total of all institutions.
(f) In the case of current and capital accounts.
(g) Balance = Net lending (-)/borrowing (+).

A.7. "Scenarios"- Impact Details

Table A.7.1. "Scenarios": Impacts on National Income

	Compensation of Labour (employees) (10^6 euros)	Compensation of Own Account Labour and Capital (10^6 euros)	Net Taxes on Products and Pruduction (10^6 euros)	Gross National Income	
				10^6 euros	%
Scenario AC					
Households	- 524	- 87		- 612	-0,1
Nonfinancial corporations		- 42		- 42	0,0
Financial corporations		- 13		- 13	0,0
Government		2	- 34	- 32	0,0
NPISH		- 3		- 3	0,0
Total	- 524	- 143	- 34	- 701	0,0
Scenario MM					
Households	- 2 018	- 541		- 2 559	-0,2
Nonfinancial corporations		- 261		- 261	0,0
Financial corporations		- 81		- 81	0,0
Government		12	- 266	- 254	0,1
NPISH		- 17		- 17	0,0
Total	- 2 018	- 887	- 266	- 3 172	0,0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 11 (similar tables were constructed for both scenarios).

Table A.7.2. "Scenarios": Impacts on Domestic Production by activity sectors

	Production		Gross Domestic Product			
	at basic prices (*)				at factor cost (*)	
	10^6 euros	%	10^6 euros	%	10^6 euros	%
Scenario AC						
Agriculture, hunting and foresty..	- 7	0,0	- 3	0,0	- 4	0,0
Industry, including energy	- 84	0,1	- 23	0,1	- 23	0,1
Construction	87	0,1	27	0,1	28	0,1
Wholesale and retail trade...	- 89	0,1	- 44	0,1	- 45	0,1
Financial, real-estate, renting ..	- 100	0,0	- 61	0,1	- 60	0,1
Other service activities	- 868	-0,2	- 591	-0,3	- 596	-0,3
Total	- 1 061	0,0	- 695	0,0	- 701	0,0
Scenario MM						
Agriculture, hunting and foresty..	- 94	0,0	- 46	0,0	- 54	0,0
Industry, including energy	- 1 080	0,2	- 294	0,2	- 297	0,2
Construction	- 73	0,2	- 23	0,1	- 23	0,1
Wholesale and retail trade...	- 626	0,2	- 314	0,3	- 317	0,3
Financial, real-estate, renting ..	- 558	0,1	- 342	0,2	- 337	0,2
Other service activities	- 2 733	-0,7	- 1 859	-0,9	- 1 876	-0,9
Total	- 5 165	0,0	- 2 878	0,0	- 2 905	0,0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 5 (similar tables were constructed for both scenarios).

Table A.7.3. "Scenarios": Impacts on costs with Domestic Production by activity sectors

	Compensation of Factors of Production				Intermediate Consumption		Net Taxes on Production		Total Costs (at basic prices)	
	Labour (employees)		Own Account Labour and Capital							
	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%	10^6 euros	%
Scenario AC										
Agriculture, hunting and foresty..	- 1	0,0	- 3	0,0	- 3	0,0	1	0,0	- 7	0,0
Industry, including energy	- 13	0,0	- 10	0,0	- 61	0,0	0	0,0	- 84	0,0
Construction	19	0,0	9	0,0	60	0,0	0	0,0	87	0,0
Wholesale and retail trade…	- 26	0,0	- 19	0,0	- 44	0,0	1	0,0	- 89	0,0
Financial, real-estate, renting ..	- 20	0,0	- 41	0,0	- 39	0,0	- 1	0,0	- 100	0,0
Other service activities	- 486	0,0	- 110	0,0	- 278	0,0	5	0,0	- 868	0,0
Total	- 527	-0,1	- 174	0,0	- 366	0,1	6	0,0	- 1 061	0,0
Scenario MM										
Agriculture, hunting and foresty..	- 10	0,0	- 44	0,1	- 48	0,1	0	-0,1	- 102	0,0
Industry, including energy	- 169	0,0	- 128	0,0	- 785	0,0	0	0,0	- 1 083	0,0
Construction	- 16	0,0	- 7	0,0	- 50	0,0	0	0,0	- 73	0,0
Wholesale and retail trade…	- 184	0,0	- 133	0,0	- 313	0,0	0	0,0	- 630	0,0
Financial, real-estate, renting ..	- 109	0,0	- 227	0,0	- 217	0,0	0	0,0	- 554	0,0
Other service activities	- 1 529	0,0	- 347	0,0	- 874	0,0	0	0,0	- 2 750	0,0
Total	- 2 018	-0,2	- 887	0,0	- 2 287	0,2	0	0,0	- 5 192	0,0

Sources: Table A.2; SAMs replicated after running the accounting multipliers (AC) and the master model (MM).

Note: This table shows the simple differences between each scenario and Portugal-05, represented in Table 6 (similar tables were constructed for both scenarios).