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**Distribution of aggregate income in Portugal within the framework of a Social Accounting Matrix. Modelling the household sector.**

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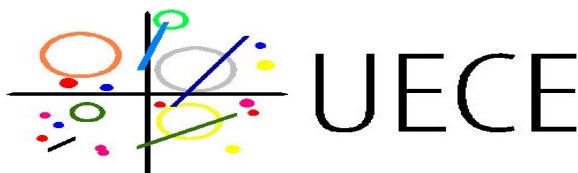
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## **Abstract**

Based on the principle that the study of a sector should be carried out under a general equilibrium approach, and moving beyond the context of partial equilibrium, the Social Accounting Matrix, usually referred to as SAM, is one possibility for meeting such needs, in that it provides a complete account of the circular flows in the economy.

The economic flows associated with households, enterprises, government and other institutions from 1995 to 2000 will be analysed from aggregated SAMs, based on the country's national accounts statistics. Accounting multipliers will be calculated to facilitate the study of the effects resulting from changes in household income. Therefore, SAMs are modelled, and structural path analysis will be used for the decomposition of the calculated multipliers. At the end, general guidelines will be established for studying income distribution and poverty in Portugal.

***Key Words:*** Social Accounting Matrix; Income distribution.

***JEL Classification:*** D57; H31; O52

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## 1. INTRODUCTION

The Social Accounting Matrix, usually known as SAM, is the working instrument used in this paper<sup>1</sup> to study the effects on the economy of changes in the income of Portuguese households from 1995 to 2000.

Compiled from the Portuguese System of National Accounts (SNA), the SAMs constructed for the Portuguese economy from 1995 to 2000 can be seen as its matrix representation, showing the entire circular flow of income. This particular technique of economic accounting will be used here. It is one which dates back to a number of different sources, starting with F. Quesnay's "tableau économique" (18th century). Sir Richard Stone pioneered the development of the SAM framework with his 1954 article "Input-Output and the Social Accounts," working on it for over roughly four decades. The general shape of a SAM framework was first described by Pyatt and Thorbecke (1976). Afterwards, Pyatt and Roe (1977) published a book giving a detailed description of the example of Sri Lanka. Since then, SAMs have been applied in a wide variety of (developed and developing) countries and regions, and with a wide variety of goals.

With different goals, SAMs have been constructed for Portugal since 1986 (Santos, 1999, 2001, 2003a, 2003b).

As will be seen in section 2, the SAM is a square matrix in which the entries made in rows specify incomes or receipts, whilst the entries made in columns specify outlays or expenditures. Its design was established with the intention of emphasising the household institutional sector and, in its treatment, attention was centred on analysing the households' expenditures and receipts.

Section 3 shows that the SAM can be understood as a general equilibrium data system, the modelling of which will help to quantify and analyse the effects of exogenous shocks or changes introduced into the households' receipts. At the same time, the whole network through which some influences or effects of exogenous shocks are transmitted will be identified and partly specified through the use of *structural path analysis*. This analytical technique was introduced into a SAM framework by Defourny and Thorbecke (1984), being used to analyse intersectoral linkages between the individual accounts of the SAM by means of the *paths* along which effects travel. The technique is seen as an alternative to the so-called

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<sup>1</sup> Based on the author's papers presented to the *Economic Policies in the New Millennium Conference* and the *Department of Economics Seminar*, which were held respectively at the University of Coimbra on 16 April 2004 and at the Higher Institute of Economics and Business Administration (Lisbon) on 6 July 2004.

traditional decomposition of multipliers, defined by Stone (1985) and Pyatt and Round (1985), which is also used here.

Section 4 ends the article with some concluding remarks.

## 2. THE PORTUGUESE SAM STRUCTURE AND THE IMPORTANCE OF THE HOUSEHOLD SECTOR

Based on the works of Graham Pyatt and his associates (Pyatt, 1988, 1991a; Pyatt and Roe, 1977; Pyatt and Round, 1985) and on the author's own previous experience (Santos, 1999, 2001, 2003a, 2003b), the constructed SAMs (see the Appendixes), compiled from the Portuguese System of National Accounts, have the basic structure that is shown in Table 1.

**Table 1.** Basic Portuguese SAM

			Outlay (expenditure)						Total	
			Institutions		Production			Rest of the World (RW)		Errors and Omissions
			Current Account	Capital Account	Factors	Activities	Products			
			(1, ...4)	(5, ...8)	(9, 10)	(11)	(12)	(13)		(14)
Incomes (receipts)	Institutions	Current Account	CT	0	NP	nta	ntp	CT← <sup>rw</sup>	0	Inc
		Capital Account	DS	KT	0	0	0	KT← <sup>rw</sup>	nL/B	I
	Production	Factors	0	0	0	AV	0	CF← <sup>rw</sup>	0	CF
		Activities	0	0	0	0	P	0	0	P
		Products	FC	GCF	0	IC	0	EX	0	D
		Rest of the World	CT→ <sup>rw</sup>	KT→ <sup>rw</sup>	CF→ <sup>rw</sup>	nta→ <sup>rw</sup>	IM		0	TV→ <sup>rw</sup>
		Errors and Omissions	0	0	0	0	tm	nL/B		nL/B
	Total	Inc	I	CF	TC	S	TV← <sup>rw</sup>	nL/B		

Note: account numbers are shown in brackets

Key:

AV = (gross) added value<sup>2</sup>

KT = capital transfers

<sup>2</sup> In accordance with the SNA's production account, this is equal to GDP at market prices minus net indirect taxes (on products and production) (Santos 2003a, pp. 11-12).

CF = compensation of factors	nL/B = net lending/borrowing <sup>3</sup>
CT = current transfers	NP = national product <sup>4</sup>
D = aggregate demand	nta = other net taxes on production
DS = (gross) domestic saving	ntp = net taxes on products
EX = exports	P = production value
FC = final consumption	S = aggregate supply
GCF = gross capital formation	TC = total costs
I = aggregate investment / investment funds	tm = trade margins
IC = intermediate consumption	TV = transactions value
IM = imports	... → <sup>rw</sup> = ... to the rest of the world
Inc = aggregate income <sup>5</sup>	... ← <sup>rw</sup> = ... from the rest of the world

Because the National Accounts were the information source from which the SAMs were constructed, almost all their (non-financial<sup>6</sup>) flows are included in them. The European System of National and Regional Accounts in the European Community of 1995 - ESA 95, which is based on the 1993 version of the United Nations System of National Accounts - SNA 93, made it possible, in a more direct way than before (SNA 68), to construct aggregated SAMs that are in perfect harmony with this.

Being a numerical representation of the cycle of production – income – expenditure, the SAM “incorporates all major transactions within a socio-economic system” (Thorbecke, 2001), as can be seen in Figure 1, where, following the flows of money, the connections that can be established between the various Portuguese SAM accounts are represented.

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<sup>3</sup> This has the opposite mathematical sign to the net lending/borrowing of the SNA’s capital account, which considers capital transfers as uses of that capital (Santos 2003a, pp. 15-16).

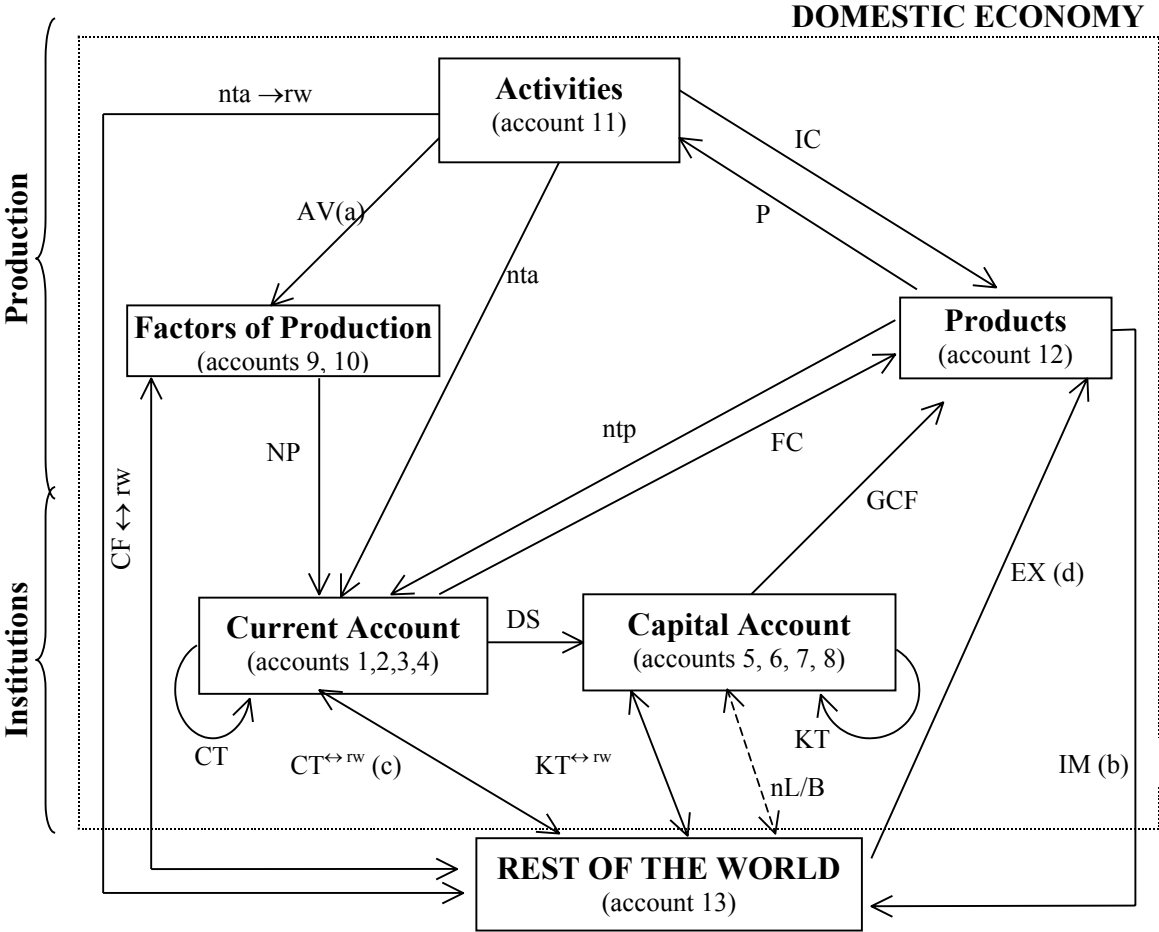
<sup>4</sup> In accordance with the SNA’s primary distribution of income accounts, this is equal to gross national income minus taxes on production and imports received by national institutions, net of subsidies paid by national institutions (Santos 2003a, pp. 12-13).

<sup>5</sup> In accordance with the SNA’s secondary distribution of income accounts, the redistribution of income in kind and the use of disposable income accounts, this is equal to gross national income plus current transfers within national institutions and current transfers from the rest of the world. Or, alternatively, it is equal to gross disposable income plus current transfers within national institutions and current transfers to the rest of the world (Santos 2003a, pp. 13-15).

<sup>6</sup> In a previous work (Santos, 1999), financial flows, reflecting financial activities in capital accounts (King 1981), were also included. When SAMs began to be constructed with data from the European System of National and Regional Accounts in the European Community of 1995 (ESA 95), this proved to be impossible due to a lack of available information.

This outline “makes it clear that, within the macro-economy, there is a circular flow process and that what happens at one point on the circuit will have implications for experience at other junctures. This observation translates into the notion that, at some point, there is a need for being equally concerned with all the different aspects of technology and behaviour that together describe the circular flow and the connections (or lack thereof) that characterise an economy” (Pyatt, 1991a).

**Figure 1.** Flows of money between the Basic Portuguese SAM accounts



Notes:

- (a) Gross Added Value at factor cost.
- (b) Includes net taxes on products that are receipts from European Union institutions.
- (c) Current transfers to the rest of the world include direct purchases abroad by residents.
- (d) Includes direct purchases in the domestic market by non-residents.

See the key to Table 1 for the meaning of the flows.

Centring our attention on institutions, it is possible in Figure 2 to see how the incomes (receipts) and the outlays (expenditures) were distributed among Portuguese institutions between 1995 and 2000.

From this same figure, it is also clear that the households lead other institutions in terms of total and current incomes and outlays, although their relative importance in terms of capital incomes and outlays is much less important, as is also shown by Table 2.

**Table 2.** Evolution of the relative importance of household current and capital income/expenditure

	(A)/(B)	(C)/(D)
1995	61.0%	20.7%
1996	59.7%	20.2%
1997	58.2%	20.7%
1998	57.9%	19.4%
1999	57.2%	19.7%
2000	57.9%	20.1%

Source: Portuguese SAMs (Appendixes)

Key:

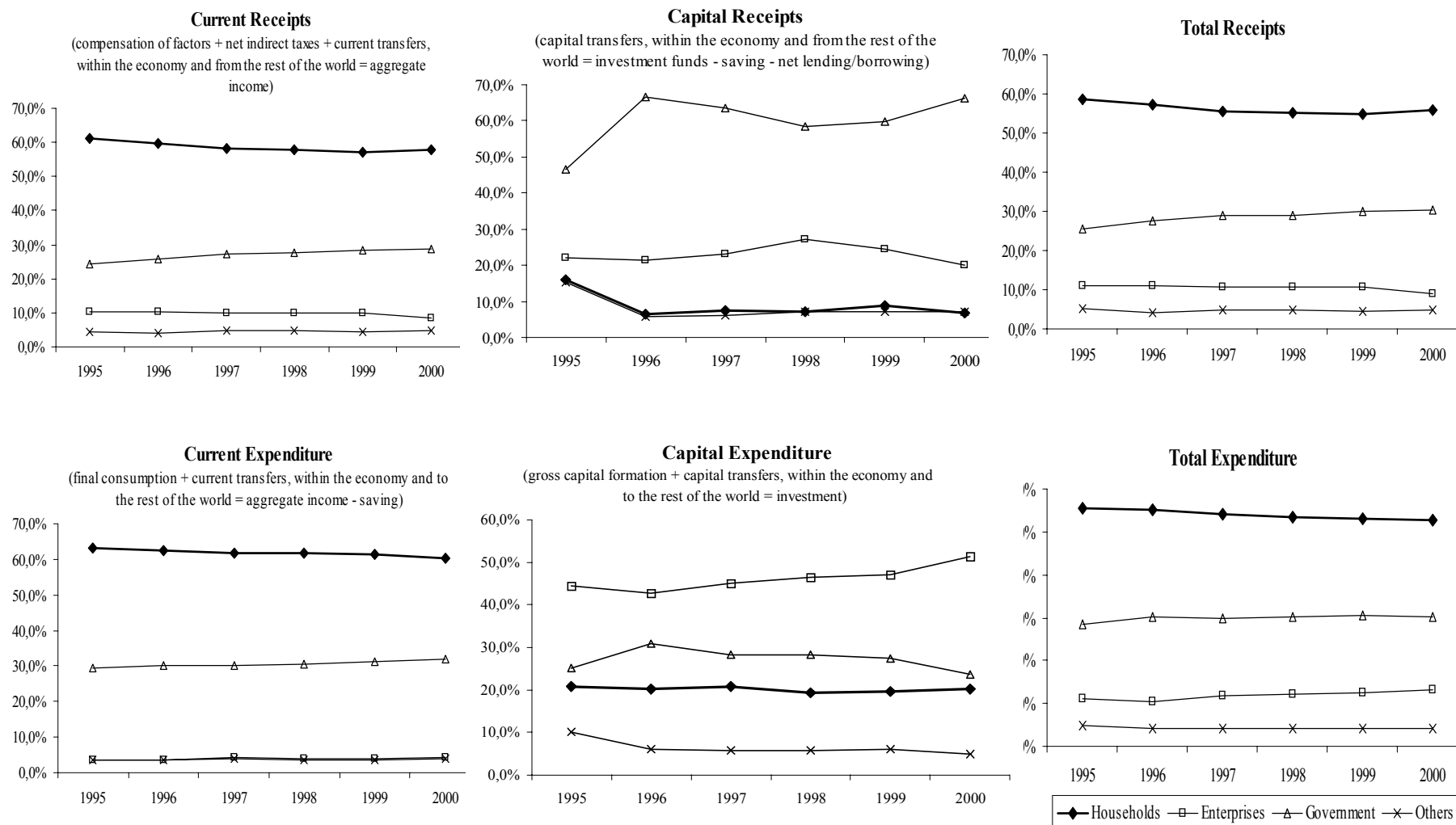
- (A) Aggregate household income (current receipts/expenditure of households)
- (B) Total aggregate income (total current receipts/expenditure)
- (C) Aggregate household investment funds/investment (capital receipts/expenditure of households)
- (D) Total aggregate investment/investment funds (total current receipts/expenditure)

Therefore, aggregate household income was more than half of total aggregate income, although its relative importance decreased, especially from 1995 to 1999. On the other hand, aggregate household investment/investment funds was less than a quarter of the total and its relative importance also decreased, especially from 1995 to 1998. These decreases would only have been relative if the average growth rates had not been as shown in Table 3.

As a matter of fact, the total amounts (of aggregate income and aggregate investment/investment funds) grew at a higher rate than the household amounts.



**Figure 2.** Distribution of incomes (receipts) and outlays (expenditures) among Portuguese Institutions from 1995 to 2000



Source: Portuguese SAMs (Appendixes)

**Table 3.** Average growth rates (between 1995 and 2000) of total and household receipts and expenditure

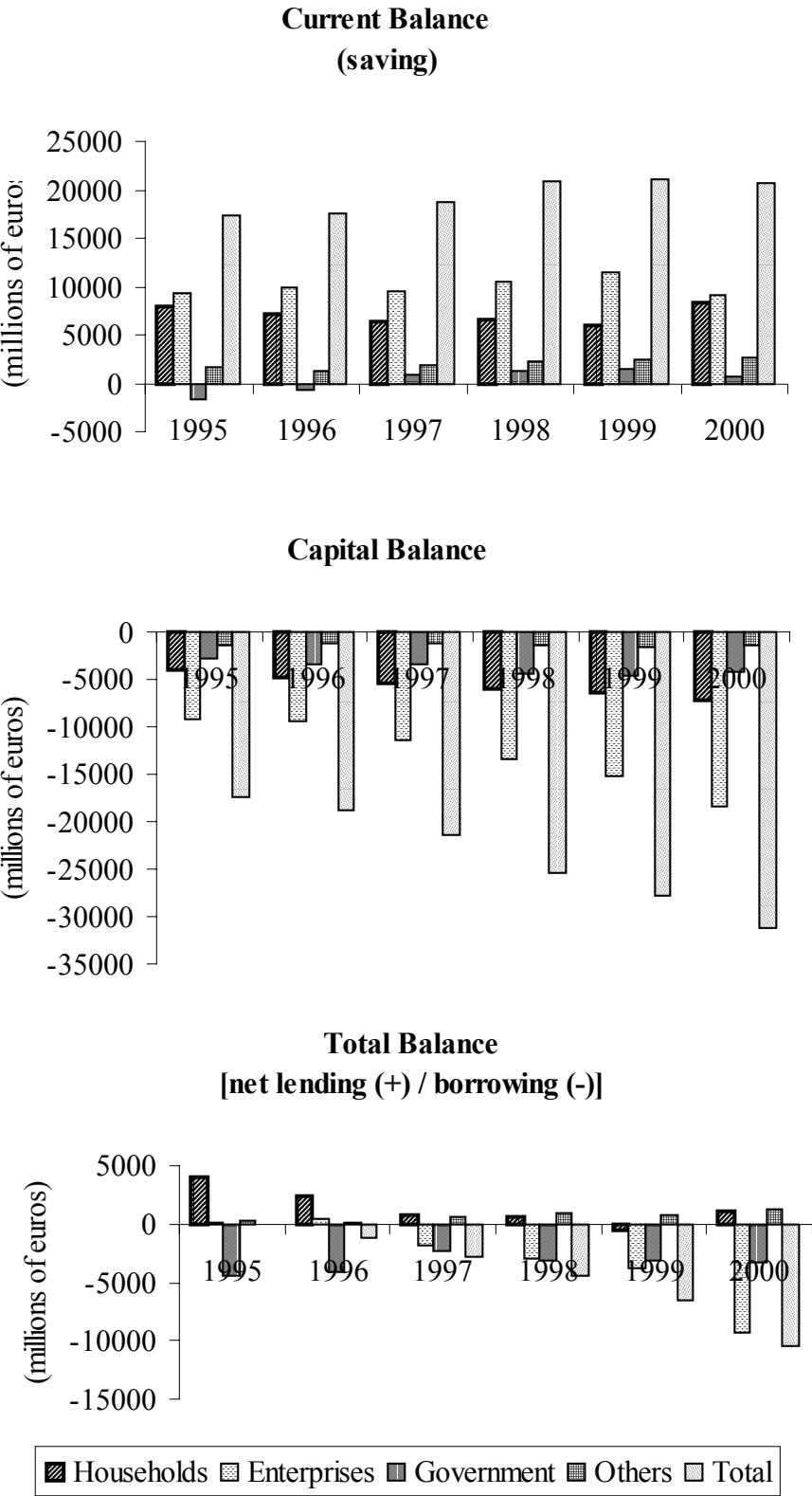
Aggregate household income (current receipts/expenditure of households)	6.7%
Total aggregate income (total current receipts/expenditure)	7.8%
Aggregate household investment funds/investment (capital receipts/expenditure of households)	8.9%
Total aggregate investment/investment funds (total current receipts/expenditure)	9.6%

Source: Portuguese SAMs (Appendixes)

The position of Portuguese institutions in terms of the balance between receipts and expenditure can be seen in Figure 3, where households show a positive current balance, i.e. saving, although the capital balance is negative, as it is for all other institutions. The total balance of households was always positive, except in 1999, although its value has shown a significant decrease. We can therefore say that, generally speaking, Portuguese households have tended to enjoy financing ability although this ability has begun to decrease. This may be an aspect to explore in any attempt made to reduce the observed increase in the net borrowing of the Portuguese economy, shown by the last (total) column for each year in the bottom graph, whose approximate share in the GDP<sup>7</sup> was: 0% in 1995; 1.3% in 1996; 3% in 1997; 4.5% in 1998; 6.1% in 1999 and 9.1% in 2000.

<sup>7</sup> Approximate GDP (in millions of euros) = Added value + other net taxes on production + net taxes on products (does not include net taxes on products that are receipts from European Union institutions, which are included in imports) = 86,211 in 1996; 92,857 in 1997; 100,815 in 1998; 107,901 in 1999 and 115,361 in 2000.

**Figure 3.** Balances between receipts and expenditures of the Portuguese economy and its institutions, between 1995 and 2000



Source: Portuguese SAMs (Appendixes)

As the beginning of an ambitious project for studying income distribution and poverty in Portugal, we will study the effects on aggregate household income and aggregate investment/investment funds resulting from changes in their current and capital receipts.

The SAM will be modelled in keeping with this aim, for the six years of our series.

### 3. THE SAM MODELLING

#### 3.1. Methodology

In keeping with the work of G. Pyatt and A. Roe (1977), G. Pyatt and J. Round (1985) and J. Defourny and E. Thorbecke (1984), the base methodology of the multipliers and their decomposition will be used, considering the current and capital accounts of households, as well as the production accounts, as endogenous.

**Table 4.** SAM in endogenous and exogenous accounts

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

Key:

- Endogenous accounts in the Portuguese SAMs, see the Appendixes (number of the accounts in brackets): current and capital accounts of households (1 and 5); factors of production (9 and 10); activities (11) and products (12).
- Exogenous accounts in the Portuguese SAMs: current and capital accounts of enterprises or non-financial corporations (2 and 6), government (3 and 7), and other institutions or financial corporations and non-profit institutions serving households (4 and 8); the rest of the world (13); and errors and omissions (14).

- L = leakages from endogenous into exogenous accounts
- X = injections from exogenous into endogenous accounts

From Table 4, 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. In other words, in aggregate terms, total injections from the exogenous into the endogenous accounts, i.e. the column sum of “x”, are equal to total leakages from the endogenous into the exogenous accounts, i.e. considering  $i'$  to be the unitary vector (row), the column sum of “1” is:  $x * i' = l * i'$ . (3)

#### a) Deduction of the accounting multipliers

In the structure of Table 4, 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 same accounts. Calling this matrix  $A_n$ , it can be written that

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

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

$$\text{Considering equation (1), } y_n = A_n * y_n + x \quad (6)$$

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

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 within the exogenous accounts or of the use of resources from the endogenous accounts within the exogenous accounts. Calling this matrix  $A_l$ , it can be written that

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

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

$$\text{Considering equation (2), } y_x = A_l * y_n + r \quad (11)$$

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

So, with the accounting multipliers, the impact of changes in receipts is analysed at the moment, assuming that the structure of expenditure in the economy does not change. This type of methodology allows for a static analysis to be made, assuming also that there is excess capacity, prices remain constant and the production technology and resource endowment are given.

To have an idea about the level of veracity of the calculated accounting multipliers, a test was carried out in accordance with such a methodology, for the beginning of our series. In order to do this, accounting multipliers were first calculated from the Portuguese SAM for 1995, whilst the changes that really occurred from 1995 to 1996 were also considered, i.e. the “x” vector of the Portuguese SAM for 1996, and the new vector of receipts of the endogenous accounts ( $y_n$ ) was calculated. From this, and with the aid of the matrices of average expenditure propensities ( $A_n$  and  $A_l$ ) for 1995, the endogenous part of the SAM was recalculated for 1996, where the value of aggregate household income showed a percentage difference in relation to the real SAM values of 1.12%, whilst the difference in investment/investment funds was 29.62%. The corresponding percentage difference, i.e. the difference between the calculated and the real total values, was 1.12% for account 9 (labour), 2.20% for account 10 (capital), 1.54% for account 11 (activities), and 1.53% for account 12 (products).

In previous studies (Santos, 1999, 2003b), lower differences were obtained, probably due to a higher level of disaggregation of the SAM accounts.

Taking into account these results and the assumptions referred to before, we will analyse our results in an indicative fashion.

#### b) Decomposition of the accounting multipliers

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

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

Thus, from equation (6):

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

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

The accounting multiplier matrix is thus decomposed into multiplicative components, each of which relates to a particular kind of connection in the system as a whole (Stone, 1985)<sup>9</sup>.

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

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

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

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

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

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

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

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

Where I represents the initial injection and the remaining components the additional effects associated, respectively, with the three components described above (M<sub>1</sub>, M<sub>2</sub> and M<sub>3</sub>).

Defourny and Thorbecke (1984) introduced an alternative to the above decomposition, namely *structural path analysis*, which makes it possible to identify and quantify the links between the pole (account) of origin and the pole (account) of destination of the impulses resulting from injections. According to this technique, the accounting multiplier is considered

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<sup>8</sup>  $y_n = A_n * y_n + x = B_n * y_n + C_n * y_n + x \Leftrightarrow y_n - B_n * y_n = C_n * y_n + x \Leftrightarrow y_n = (I - B_n)^{-1} * C_n * y_n + (I - B_n)^{-1} * x \Leftrightarrow y_n - (I - B_n)^{-1} * C_n * y_n = (I - B_n)^{-1} * x \Leftrightarrow y_n * [I - (I - B_n)^{-1} * C_n] = (I - B_n)^{-1} * x \Leftrightarrow y_n = [I - (I - B_n)^{-1} * C_n]^{-1} * (I - B_n)^{-1} * x.$

<sup>9</sup> For a detailed deduction and explanation of these components, see, for example, Stone (1985, pp. 156-162); Pyatt and Round (1985, pp. 192-197); Santos (1999, pp. 67-69).

as a “global influence”, which is decomposed into a series of “total influences”. These, in turn, are decomposed into “direct influences” multiplied by the “path multiplier”:

$$ma_{ji} = I_{(i \rightarrow j)}^G = \sum_{p=1}^n I_{(i \rightarrow j)p}^T = \sum_{p=1}^n I_{(i \rightarrow j)p}^D * Mp \quad (20)$$

Where:

$ma_{ji}$  is the  $(j,i)^{th}$  element of the  $M_a$  (accounting multipliers) matrix, which quantifies the full effect of a unitary injection  $x_j$  on the endogenous variable  $y_j$ ;

$I_{(i \rightarrow j)}^G$  is the *Global Influence* of pole  $i$  on pole  $j$ ;

$p$  is the  $n^{th}$  elementary *path* - the arc linking two different poles, oriented in the direction of the expenditure, located between  $i$  and  $j$ , with  $i$  being the pole of origin of the elementary *path 1* (the first) and  $j$  the pole of destination of the elementary *path n* (the last);

$I_{(i \rightarrow j)p}^T$  is the *Total Influence* transmitted from  $i$  to  $j$  along the elementary *path p*;

$I_{(i \rightarrow j)p}^D$  is the *Direct Influence* of  $i$  on  $j$  transmitted along the elementary *path p*, which measures the magnitude of the influence transmitted between its two poles through the average expenditure propensity;

$Mp$  is the *Multiplier* of the *path p*, or the *path Multiplier*, which expresses the extent to which the influence along elementary *path p* is amplified through the effects of adjacent feedback circuits<sup>10</sup>:

$$Mp = \frac{\Delta p}{\Delta} \quad (21)$$

where:  $\Delta$  = the determinant of matrix  $|I-A_n|$  of the structure represented by the SAM,

$\Delta p$  = the determinant of the submatrix of  $|I-A_n|$  obtained by removing the row and the column associated with the poles of the elementary *path p*.

<sup>10</sup> A circuit is a path for which the first pole (pole of origin) coincides with the last pole (pole of destination) (Defourny and Thorbecke, 1984, p. 119).



### 3.2. Evaluation with changes in household income

#### a) Effects of changes in household current income

In keeping with what was seen before, the items that can be changed in household current receipts (the items in row 1 of the X matrix, presented in Table 4 or cells (1,2), (1,3), (1,4) and (1,13), of the SAMs (in the Appendixes, see also the description of the cell contents) are:

1. social benefits other than social transfers in kind from non-financial corporations, government, financial corporations, non-profit institutions serving households and the rest of the world;
2. social transfers in kind from government and non-profit institutions serving households;
3. non-life insurance claims from financial corporations and the rest of the world;
4. miscellaneous current transfers from non-financial corporations, government and the rest of the world;

Average expenditure propensities show that households spent a unit of their current receipts as follows (column 1 of  $A_n$  and  $A_l$  matrices):

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
- Current transfers within households, to government, other institutions and the rest of the world.....	0.15	0.15	0.15	0.15	0.15	0.15
- Gross savings .....	0.10	0.09	0.07	0.07	0.06	0.08
- Final consumption .....	0.75	0.76	0.77	0.78	0.79	0.77

Therefore, three quarters or more of a unit of household current receipts go towards final consumption. Its relative share increased from 1995 to 1999, recording a slight decrease in 2000, but nonetheless always changing by the same amount as the decrease (increase in 2000) in gross savings. The current transfers, within households, to government, other institutions and the rest of the world, remained unaltered in the expenditure structure of Portuguese households in the period studied.

These values can be understood as reflecting the direct influence of a unitary change in the (above-described) household current receipts, whereas the global influence is quantified by the values of the accounting multipliers and their components, as shown in Tables 5, 6 and 7.

**Table 5:** Global influences of unitary changes in the exogenous current receipts of households

	1995	1996	1997	1998	1999	2000
Aggregate income of households	1.662	1.638	1.584	1.569	1.557	1.545
Aggregate investment /investment funds of households	0.168	0.140	0.115	0.112	0.093	0.118
Compensation of labour	0.508	0.501	0.473	0.467	0.465	0.464
Compensation of capital	0.424	0.413	0.388	0.383	0.371	0.348
Production value/total costs	2.034	1,999	1,907	1,863	1,816	1.816
Aggregate demand/supply	2.543	2.500	2.400	2.367	2.322	2.330

Source: Portuguese accounting multiplier matrices ( $M_a$ ) from 1995 to 2000.

Apart from the effect on the aggregate income of households, where 1 is the initial injection of income, the greatest effects of unitary changes in the current receipts of households were felt on production values and aggregate demand, reflecting the great importance of final consumption for the total current outlays of households, as noted earlier.

On the other hand, the predominance of additional extragroup influences, shown by Table 6, means that most of the repercussions originating from the current account of households (1) do not return to it, with the additional intergroup influences, shown by Table 7, representing those repercussions that do in fact return. Additional intragroup effects were felt only at the level of the aggregate income of households, with a constant value of 0.005. In turn, the positive values of all these influences represent changes that have the same mathematical sign as the initial change – for instance, increases in the exogenous current receipts of households will result in increases in the items presented in the rows of Tables 5, 6 or 7.

**Table 6:** Additional extragroup influences of unitary changes in the exogenous current receipts of households

	1995	1996	1997	1998	1999	2000
Aggregate income of households	0.552	0.537	0.495	0.483	0.476	0.462
Aggregate investment /investment funds of households	0.143	0.119	0.098	0.096	0.079	0.102
Compensation of labour	0.410	0.404	0.380	0.376	0.374	0.373
Compensation of capital	0.342	0.333	0.311	0.308	0.299	0.280
Production value/total costs	1.824	1.798	1.725	1.688	1.652	1.647
Aggregate demand/supply	2.129	2.090	2.007	1.982	1.943	1.957

Source: Additional extragroup effects matrices ( $(M_3-I)*M_2*M_1$ ) from 1995 to 2000.

**Table 7:** Additional intergroup influences of unitary changes in the exogenous current receipts of households

	1995	1996	1997	1998	1999	2000
Aggregate income of households	0.104	0.096	0.083	0.081	0.076	0.078
Aggregate investment /investment funds of households	0.025	0.021	0.017	0.016	0.014	0.017
Compensation of labour	0.098	0.097	0.093	0.091	0.091	0.091
Compensation of capital	0.082	0.080	0.076	0.075	0.073	0.068
Production value/total costs	0.210	0.201	0.182	0.174	0.165	0.169
Aggregate demand/supply	0.414	0.410	0.393	0.385	0.380	0.374

Source: Additional intergroup effects matrices  $((M_2-I)*M_1)$  from 1995 to 2000.

The general decrease in the global influence (and its components) from 1995 to 2000, sometimes with a slight increase in 2000, is in keeping with what was seen in Tables 2 (see also the three left hand graphs of Figure 1A, in the Appendix), namely the decrease in the relative share of aggregate household income in total aggregate income.

#### b) Effects of changes in household capital income

The items that can be changed in household capital income (the items in row 5 of the X matrix, presented in Table 4, or cells (5,7), (5,8), (5,13) and (5,14), of the SAMs) are:

1. investment grants from government and the rest of the world;
2. (other) capital transfers from financial corporations and the rest of the world;
3. net lending.

As was seen before, average expenditure propensities show that households spent a unit of their (now) capital receipts as follows (column 5 of  $A_n$  and  $A_l$  matrices):

	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
- Gross Capital Formation.....	1.13	1.14	1.08	1.13	1.12	1.14
- Capital taxes and (other) capital transfers to government.....	0.01	0.01	0.06	0.01	0.01	0.01
- Acquisitions minus disposals of non-produced non-financial assets and (other) capital transfers to the rest of the world. ....	-0.14	-0.16	-0.13	-0.14	-0.13	-0.15

The predominance of gross capital formation is evident, with a slight fluctuation from 1995 to 2000. Once again, the direct influence of a unitary change in the (now capital) receipts of households was most noted in the products account (12).

Table 8 shows the global influences of a similar change.

**Table 8:** Global influences of unitary changes in the exogenous capital receipts of households

	1995	1996	1997	1998	1999	2000
Aggregate income of households	0.853	0.837	0.727	0.735	0.718	0.713
Aggregate investment /investment funds of households	1.087	1.071	1.053	1.053	1.043	1.055
Compensation of labour	0.661	0.663	0.595	0.609	0.605	0.612
Compensation of capital	0.551	0.546	0.487	0.499	0.483	0.460
Production value/total costs	2.645	2.642	2.398	2.428	2.363	2.396
Aggregate demand/supply	3.307	3.304	3.018	3.085	3.021	3.075

Source: Portuguese accounting multiplier matrices ( $M_a$ ) from 1995 to 2000.

Therefore, apart from the effect on the investment funds/aggregate investment of households, where 1 is the initial injection of income, the greatest effects of unitary changes in the capital receipts of households were felt in production values and aggregate demand, just as in the case of current receipts, but now with higher values, reflecting the large share of gross capital formation in the total capital outlays of households.

**Table 9:** Additional extragroup influences of unitary changes in the exogenous capital receipts of households

	1995	1996	1997	1998	1999	2000
Aggregate income of households	0.752	0.738	0.643	0.651	0.638	0.633
Aggregate investment /investment funds of households	0.051	0.042	0.030	0.030	0.024	0.031
Compensation of labour	0.526	0.527	0.473	0.484	0.482	0.486
Compensation of capital	0.439	0.434	0.388	0.397	0.385	0.365
Production value/total costs	2.412	2.411	2.196	2.229	2.171	2.204
Aggregate demand/supply	2.731	2.730	2.499	2.558	2.507	2.554

Source: Additional extragroup effects matrices ( $(M_3-I)*M_2*M_1$ ) from 1995 to 2000.

**Table 10:** Additional intergroup influences of unitary changes in the exogenous capital receipts of households

	1995	1996	1997	1998	1999	2000
Aggregate income of households	0.101	0.099	0.084	0.083	0.081	0.080
Aggregate investment /investment funds of households	0.036	0.030	0.022	0.023	0.019	0.024
Compensation of labour	0.135	0.135	0.122	0.124	0.123	0.126
Compensation of capital	0.112	0.111	0.100	0.102	0.098	0.094
Production value/total costs	0.233	0.231	0.202	0.199	0.192	0.192
Aggregate demand/supply	0.576	0.574	0.519	0.527	0.515	0,521

Source: Additional intergroup effects matrices  $((M_2-I)*M_1)$  from 1995 to 2000.

Once again, we have positive values for all the additional influences and a predominance of extragroup influences, as can be seen in Tables 9 and 10, meaning that most of the repercussions originating from the capital account of households (5) do not return to it.

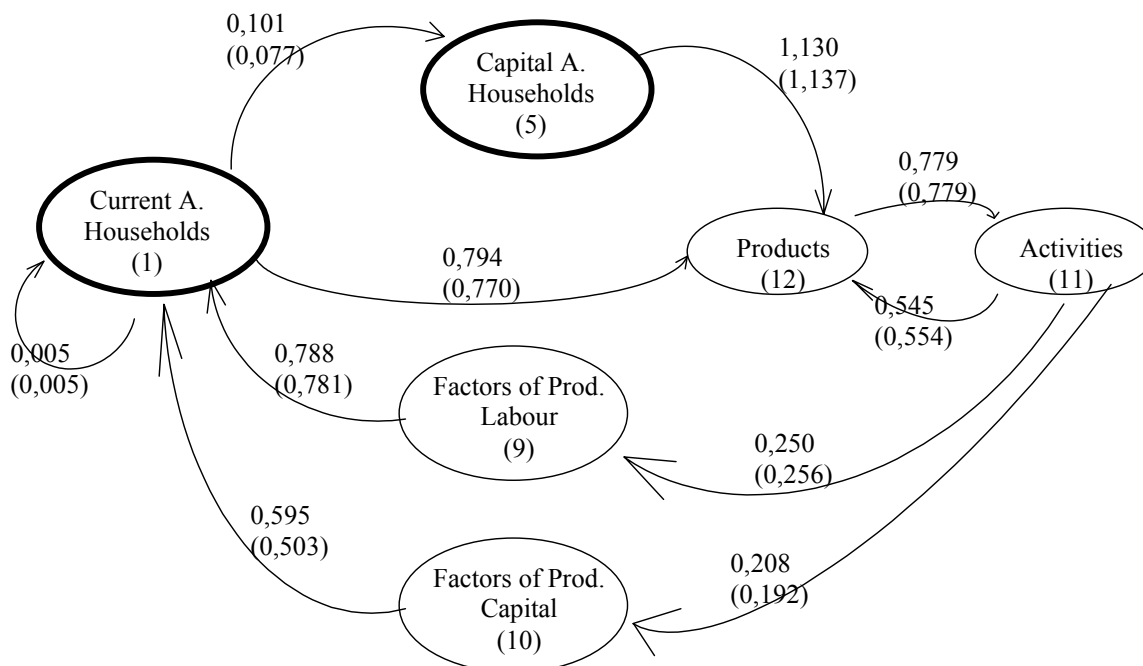
As was seen in the case of changes in household current income, and also in the case of household capital income, there is a general decrease in the global influence (and its components) from 1995 to 2000, sometimes with a slight increase in 2000 - see also the three right hand graphs of Figure 1A, in the Appendix.

#### c) Network of linkages between endogenous accounts

Figure 4 helps us to understand the importance of the additional extragroup influences of changes taking place in the current or capital accounts of households (Tables 6 and 9), as well as the values of the global influences (Tables 5 and 8) of changes in the current and capital receipts of households on production accounts (9-12).

Considering the importance of final consumption for households, the cells (12,1) of the accounting multiplier matrices ( $M_a$ ) were decomposed, from 1995 to 2000, through *structural path analysis*, in keeping with equation (20). Table 11 shows the results of this analysis.

**Figure 4.** Network of elementary paths and adjacent circuits linking endogenous accounts



Note: This outline represents only the *paths* whose poles of origin and destination are the endogenous accounts of our model.

Source:  $A_n$  (average expenditure propensity) matrices, calculated from the Portuguese SAMs for 1995 and 2000 (values in brackets)

**Table 11:** *Structural path analysis* of the global influences on aggregate demand of unitary changes in the exogenous current receipts of households

	1995	1996	1997	1998	1999	2000
Accounting Multiplier	2.543	2.500	2.400	2.367	2.322	2.330
$I_{(1 \rightarrow 12)1}^T$	0.337	0.283	0.220	0.222	0.181	0.237
$I_{(1 \rightarrow 12)2}^T$	2.206	2.216	2.180	2.145	2.141	2.093
$I_{(1 \rightarrow 12)1}^D$	0.115	0.097	0.078	0.081	0.067	0.087
$I_{(1 \rightarrow 12)2}^D$	0.749	0.762	0.774	0.778	0.790	0.770
$Mp$	2.944	2.909	2.817	2.756	2.711	2.718

Source: Portuguese accounting multiplier matrices ( $M_a$ ) from 1995 to 2000.

As can be seen from Figure 4, *path 1*, represented by the arc above, links account 1 to account 12 through account 5, while *path 2* makes the same link, but in this case directly. The total influence of the first is significantly lower than that of the second, whilst the high values of the *path multipliers* show that the most important influences are those of adjacent feedback circuits, a feature that is in keeping with what was noted in relation to the amounts of the additional extragroup and intergroup influences.

A general decrease can be noted here in all the influences from 1995 to 2000, sometimes with a slight increase in 2000. Positive values can also be noted.

#### 4. CONCLUDING REMARKS

The SAM approach has shown itself to be a practical working instrument of considerable value as an accounting framework that includes all non-financial transactions within the economy and thereby provides a quantitative basis for analysis.

It was possible to see that Portuguese aggregate household income amounted to more than half of the total aggregate income of Portugal and that the relative share of the former in the latter decreased from 1995 to 2000, with the average growth rates in that period being lower for household current and capital income than for the total.

Changes in social benefits and transfers, non-life insurance claims and miscellaneous current transfers (current incomes), received by households, mostly affected aggregate demand through final consumption and the production value in direct and global terms. Almost the same effect was produced by changes in investment grants and (other) capital transfers (capital incomes), but this time through gross capital formation. In the case of such impacts, additional extragroup effects predominated, meaning that most of the repercussions of those changes do not return to the account where they were originally felt, and that the additional intergroup effects represent those repercussions that do return (additional intragroup effects were not felt). This fact was confirmed by the high values of the calculated *path multipliers* for the impact of a unitary change in households' current receipts (account 1) on the products account (12).

In all the experiments carried out with the built model, the effects had the same mathematical sign as the initial change and their amounts were, generally speaking, less

important in 2000 than in 1995 but revealing a stable tendency (shown by the various tables and graphs presented).

Therefore, the SAM-based study that was carried out has made it possible to describe some structural features of the Portuguese economy from 1995 to 2000 with an emphasis on households. Through its modelling with the use of accounting multipliers, it was possible to set limits for the quantitative impact (i.e. the limits within which the impact could be noted) of various types of interventions relating to household income on the economy as a whole, with their importance for production accounts and the stability of these limits being evident.

Despite its limiting assumptions, the SAM can be understood as a useful working instrument for improving our basic knowledge of all socio-economic mechanisms, as well as for constructing short-term scenarios involving changes in certain flows that it represents. Besides the test on the veracity of the results, undertaken in this study, many others could be undertaken, involving other years, to confirm the usefulness of the SAM. Other studies could also be undertaken, changing, for instance, the position of the dividing line between endogenous and exogenous accounts (using the words of Stone, 1981) or the expenditure structure.

We hope that the present study has been a good starting point for a study that we plan to carry out into income distribution and poverty in Portugal, using the SAM<sup>11</sup>. The next stage will be the disaggregation of the household sector, identifying the poor, and research into other modelling methodologies (based on SAMs), with less limiting assumptions.

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<sup>11</sup> The set of articles about the special issue “Accounting for poverty and income distribution analysis”, published in June 2003 in Vol. 15(2) of *Economic Systems Research*, and, in a more indirect way, the book by Duchin, F. (1998) “Structural Economics: Measuring Changes in Technologies, Lifestyles, and the Environment” (New York, Oxford University Press) have been useful guides.



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## APPENDIXES

Portuguese Social Accounting Matrix for 1995 (in millions of euros)

		Outlays (Expenditures)		INSTITUTIONS										PRODUCTION					REST OF THE WORLD	Errors and Omissions	TOTAL
				Current Account					Capital Account					Factors of Production			Activities	Products			
				Households	Enterprises	Government	Others	Sum	Households	Enterprises	Government	Others	Sum	Labour	Capital	Sum					
1	2	3	4	5	6	7	8	9	10	11	12	13	14								
INSTITUTIONS	Current Account	Households	1	428	1.349	18.512	3.337	23.626	0	0	0	0	0	30.489	20.994	51.483	0	0	3.308	0	78.417
		Enterprises	2	0	58	0	376	434	0	0	0	0	0	1.339	11.561	12.900	0	0	10	0	13.344
		Government	3	8.074	2.108	6.866	235	17.284	0	0	0	0	0	5.809	-2.558	3.251	-346	10.283	609	0	31.081
		Others	4	1.398	443	881	83	2.804	0	0	0	0	0	983	1.924	2.908	0	0	33	0	5.746
		Sum		9.901	3.957	26.259	4.031	44.148	0	0	0	0	0	38.620	31.922	70.542	-346	10.283	3.960	0	128.587
	Capital Account	Households	5	7.952	0	0	0	7.952	0	0	206	812	1.018	0	0	0	0	0	147	-4.023	5.095
		Enterprises	6	0	9.342	0	0	9.342	0	0	707	0	707	0	0	0	0	0	896	-49	10.896
		Government	7	0	0	-1.661	0	-1.661	63	161	1.870	7	2.100	0	0	0	0	0	1.275	4.423	6.136
		Others	8	0	0	0	1.659	1.659	0	484	293	328	1.105	0	0	0	0	0	1	-310	2.455
		Sum		7.952	9.342	-1.661	1.659	17.291	63	645	3.075	1.147	4.930	0	0	0	0	0	2.320	40	24.582
PRODUCTION	Factors of Production	Labour	9	0	0	0	0	0	0	0	0	0	0	0	0	38.563	0	120	0	38.683	
		Capital	10	0	0	0	0	0	0	0	0	0	0	0	0	32.161	0	3.123	0	35.285	
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	70.725	0	3.243	0	73.968	
	Activities	11	0	0	0	0	0	0	0	0	0	0	0	0	0	154.394	0	0	0	154.394	
	Products	12	58.755	0	6.143	0	64.898	5.755	9.562	3.018	1.288	19.623	0	0	0	84.102	0	24.433	0	193.056	
REST OF THE WORLD	13	1.810	45	339	56	2.249	-723	689	43	20	29	64	3.363	3.426	-87	28.379	X	0	33.996		
Errors and Omissions	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	41	X	41		
TOTAL		78.417	13.344	31.081	5.746	128.587	5.095	10.896	6.136	2.455	24.582	38.683	35.285	73.968	154.394	193.056	33.996	40	X		

Source: Portuguese National Accounts

## Portuguese Social Accounting Matrix for 1996 (in millions of euros)

		Outlays (Expenditures)		INSTITUTIONS										PRODUCTION				REST OF THE WORLD	Errors and Omissions	TOTAL	
				Current Account					Capital Account					Factors of Production			Activities				Products
				Households	Enterprises	Government	Others	Sum	Households	Enterprises	Government	Others	Sum	Labour	Capital	Sum					
1	2	3	4		5	6	7	8		9	10		11	12	13	14					
Incomes(Receipts)																					
INSTITUTIONS	Current Account	Households	1	428	1.411	20.450	3.641	25.931	0	0	0	0	0	32.790	21.181	53.971	0	0	3.133	0	83.036
		Enterprises	2	0	67	1	423	490	0	0	0	0	0	1.404	12.533	13.937	0	0	13	0	14.441
		Government	3	8.763	2.523	8.422	301	20.009	0	0	0	0	6.209	-1.984	4.225	-508	11.293	883	0	35.902	
		Others	4	1.566	465	1.064	87	3.182	0	0	0	0	1.001	1.596	2.597	0	0	44	0	5.822	
		Sum		10.757	4.466	29.937	4.453	49.612	0	0	0	0	41.404	33.327	74.730	-508	11.293	4.073	0	139.201	
	Capital Account	Households	5	7.088	0	0	0	7.088	0	0	234	48	282	0	0	0	0	0	151	-2.380	5.141
		Enterprises	6	0	9.926	0	0	9.926	0	0	901	0	901	0	0	0	0	0	527	-490	10.864
		Government	7	0	0	-730	0	-730	71	88	2.664	9	2.832	0	0	0	0	0	1.614	4.115	7.831
		Others	8	0	0	0	1.313	1.313	0	0	334	48	382	0	0	0	0	0	2	-131	1.566
		Sum		7.088	9.926	-730	1.313	17.598	71	88	4.134	104	4.397	0	0	0	0	0	2.294	1.113	25.401
PRODUCTION	Factors of Production	Labour	9	0	0	0	0	0	0	0	0	0	0	0	0	41.367	0	114	0	41.482	
		Capital	10	0	0	0	0	0	0	0	0	0	0	0	0	34.059	0	3.361	0	37.420	
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	75.426	0	3.476	0	78.902	
	Activities	11	0	0	0	0	0	0	0	0	0	0	0	0	0	164.951	0	0	0	164.951	
	Products	12	63.256	0	6.267	0	69.523	5.868	10.031	3.596	1.411	20.907	0	0	0	90.107	0	25.731	0	206.268	
REST OF THE WORLD		13	1.934	49	428	56	2.468	-798	745	101	50	98	78	4.093	4.171	-74	30.023	X	0	36.687	
Errors and Omissions		14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.113	X	1.113	
TOTAL			83.036	14.441	35.902	5.822	139.201	5.141	10.864	7.831	1.566	25.401	41.482	37.420	78.902	164.951	206.268	36.687	1.113	X	

Source: Portuguese National Accounts

Portuguese Social Accounting Matrix for 1997 (in millions of euros)

Outlays (Expenditures)			INSTITUTIONS										PRODUCTION					REST OF THE WORLD	Errors and Omissions	TOTAL	
			Current Account					Capital Account					Factors of Production			Activities	Products				
			Households	Enterprises	Government	Others	Sum	Households	Enterprises	Government	Others	Sum	Labour	Capital	Sum						
																1	2				3
Incomes (Receipts)																					
INSTITUTIONS	Current Account	Households	1	451	1.465	21.525	3.885	27.326	0	0	0	0	0	35.157	20.930	56.087	0	0	3.270	0	86.683
		Enterprises	2	0	78	4	460	542	0	0	0	0	0	1.457	12.945	14.402	0	0	18	0	14.962
		Government	3	9.322	3.291	9.058	484	22.155	0	0	0	0	0	6.829	-925	5.904	-366	12.207	537	0	40.437
		Others	4	1.687	516	1.132	117	3.452	0	0	0	0	0	1.119	2.318	3.437	0	0	43	0	6.932
		Sum		11.460	5.350	31.719	4.946	53.475	0	0	0	0	0	44.562	35.268	79.830	-366	12.207	3.868	0	149.014
	Capital Account	Households	5	6.281	0	0	0	6.281	0	0	307	96	403	0	0	0	0	0	184	-804	6.064
		Enterprises	6	0	9.566	0	0	9.566	0	0	736	0	736	0	0	0	0	0	1.056	1.839	13.197
		Government	7	0	0	961	0	961	334	69	2.754	9	3.166	0	0	0	0	0	1.762	2.380	8.269
		Others	8	0	0	0	1.913	1.913	0	0	364	96	460	0	0	0	0	0	2	-650	1.725
		Sum		6.281	9.566	961	1.913	18.721	334	69	4.161	201	4.765	0	0	0	0	0	3.004	2.765	29.255
PRODUCTION	Factors of Production	Labour	9	0	0	0	0	0	0	0	0	0	0	0	0	44.537	0	126	0	44.663	
		Capital	10	0	0	0	0	0	0	0	0	0	0	0	0	36.479	0	3.497	0	39.976	
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	81.016	0	3.623	0	84.639	
	Activities	11	0	0	0	0	0	0	0	0	0	0	0	0	0	179.440	0	0	0	179.440	
	Products	12	67.097	0	7.214	0	74.311	6.530	12.272	4.051	1.523	24.376	0	0	0	98.853	0	28.291	0	225.831	
REST OF THE WORLD	13	1.845	46	543	73	2.507	-800	856	57	1	114	101	4.708	4.809	-63	34.184	X	0	41.551		
Errors and Omissions	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.765	X	2.765		
TOTAL		86.683	14.962	40.437	6.932	149.014	6.064	13.197	8.269	1.725	29.255	44.663	39.976	84.639	179.440	225.831	41.551	2.765	X		

Source: Portuguese National Accounts

## Portuguese Social Accounting Matrix for 1998 (in millions of euros)

		Outlays (Expenditures)		INSTITUTIONS										PRODUCTION			REST OF THE WORLD	Errors and Omissions	TOTAL		
				Current Account					Capital Account					Factors of Production							
				Households	Enterprises	Government	Others	Sum	Households	Enterprises	Government	Others	Sum	Labour	Capital	Sum				Activities	Products
Incomes (Receipts)		1	2	3	4	5	6	7	8	9	10	11	12	13	14						
INSTITUTIONS	Current Account	Households	1	482	1.578	23.513	3.958	29.531	0	0	0	0	37.965	22.156	60.121	0	0	3.455	0	93.107	
		Enterprises	2	0	123	6	465	594	0	0	0	0	1.578	13.737	15.315	0	0	20	0	15.929	
		Government	3	9.735	3.119	9.829	544	23.227	0	0	0	0	7.606	-583	7.023	-604	13.602	920	0	44.168	
		Others	4	1.630	483	1.209	115	3.437	0	0	0	0	1.186	2.806	3.992	0	0	77	0	7.506	
		Sum		11.847	5.303	34.557	5.082	56.789	0	0	0	0	48.335	38.116	86.451	-604	13.602	4.472	0	160.710	
	Capital Account	Households	5	6.666	0	0	0	6.666	0	0	238	220	458	0	0	0	0	0	196	-672	6.648
		Enterprises	6	0	10.572	0	0	10.572	0	0	1.292	0	1.292	0	0	0	0	0	1.152	2.912	15.928
		Government	7	0	0	1.249	0	1.249	92	57	3.660	8	3.817	0	0	0	0	0	1.431	3.201	9.698
		Others	8	0	0	0	2.316	2.316	0	0	420	220	640	0	0	0	0	0	3	-931	2.028
		Sum		6.666	10.572	1.249	2.316	20.803	92	57	5.610	448	6.207	0	0	0	0	0	2.782	4.510	34.302
PRODUCTION	Factors of Production	Labour	9	0	0	0	0	0	0	0	0	0	0	0	0	48.266	0	153	0	48.419	
		Capital	10	0	0	0	0	0	0	0	0	0	0	0	0	39.550	0	3.990	0	43.540	
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	87.816	0	4.143	0	91.959	
	Activities	11	0	0	0	0	0	0	0	0	0	0	0	0	0	192.561	0	0	0	192.561	
	Products	12	72.444	0	7.705	0	80.149	7.480	14.905	3.984	1.606	27.975	0	0	0	105.403	0	31.135	0	244.662	
REST OF THE WORLD		13	2.150	54	657	108	2.969	-924	966	104	-26	120	84	5.424	5.508	-54	38.499	X	0	47.042	
Errors and Omissions		14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4.510	X	4.510	
TOTAL			93.107	15.929	44.168	7.506	160.710	6.648	15.928	9.698	2.028	34.302	48.419	43.540	91.959	192.561	244.662	47.042	4.510	X	

Source: Portuguese National Accounts

Portuguese Social Accounting Matrix for 1999 (in millions of euros)

Outlays (Expenditures)		INSTITUTIONS										PRODUCTION				REST OF THE WORLD	Errors and Omissions	TOTAL			
		Current Account					Capital Account					Factors of Production			Activities				Products		
		Households	Enterprises	Government	Others	Sum	Households	Enterprises	Government	Others	Sum	Labour	Capital	Sum		11	12	13		14	
1	2	3	4	Sum	5	6	7	8	Sum	9	10	Sum	11	12	13	14					
INSTITUTIONS	Current Account	Households	1	520	1.550	25.813	4.053	31.936	0	0	0	0	0	41.242	22.389	63.631	0	0	3.647	0	99.214
		Enterprises	2	0	134	3	517	654	0	0	0	0	0	1.550	15.229	16.779	0	0	11	0	17.444
		Government	3	10.514	3.790	11.047	660	26.011	0	0	0	0	0	8.174	-557	7.617	-832	15.025	1.088	0	48.909
		Others	4	1.650	507	1.349	115	3.621	0	0	0	0	0	1.154	2.971	4.125	0	0	81	0	7.827
		Sum		12.684	5.981	38.212	5.345	62.222	0	0	0	0	0	52.120	40.032	92.152	-832	15.025	4.827	0	173.394
	Capital Account	Households	5	5.916	0	0	0	5.916	0	0	259	313	572	0	0	0	0	0	266	552	7.306
		Enterprises	6	0	11.401	0	0	11.401	0	0	1.283	0	1.283	0	0	0	0	0	1.019	3.717	17.420
		Government	7	0	0	1.404	0	1.404	103	91	3.704	7	3.905	0	0	0	0	0	1.719	3.100	10.128
		Others	8	0	0	0	2.423	2.423	0	0	344	313	657	0	0	0	0	0	4	-799	2.285
		Sum		5.916	11.401	1.404	2.423	21.144	103	91	5.590	633	6.417	0	0	0	0	0	3.008	6.570	37.139
	PRODUCTION	Factors of Production	Labour	9	0	0	0	0	0	0	0	0	0	0	0	0	52.092	0	147	0	52.239
			Capital	10	0	0	0	0	0	0	0	0	0	0	0	0	41.616	0	3.975	0	45.591
			Sum		0	0	0	0	0	0	0	0	0	0	0	0	93.708	0	4.122	0	97.830
		Activities	11	0	0	0	0	0	0	0	0	0	0	0	0	0	203.614	0	0	0	203.614
Products		12	78.353	0	8.511	0	86.864	8.185	16.298	4.481	1.621	30.585	0	0	0	110.801	0	32.089	0	260.339	
REST OF THE WORLD	13	2.261	62	782	59	3.164	-982	1.031	57	31	137	119	5.559	5.678	-63	41.700	X	0	50.616		
Errors and Omissions	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.570	X	6.570		
TOTAL		99.214	17.444	48.909	7.827	173.394	7.306	17.420	10.128	2.285	37.139	52.239	45.591	97.830	203.614	260.339	50.616	6.570	X		

Source: Portuguese National Accounts

Portuguese Social Accounting Matrix for 2000 (in millions of euros)

Outlays (Expenditures)		INSTITUTIONS										PRODUCTION					REST OF THE WORLD	Errors and Omissions	TOTAL		
		Current Account					Capital Account					Factors of Production			Activities	Products					
		Households	Enterprises	Government	Others	Sum	Households	Enterprises	Government	Others	Sum	Labour	Capital	Sum							
1	2	3	4	5	6	7	8	9	10	11	12	13	14								
Incomes(Receipts)																					
INSTITUTIONS	Current Account	Households	1	533	1.678	28.663	4.779	35.652	0	0	0	0	0	44.716	24.052	68.769	0	0	4.110	0	108.531
		Enterprises	2	0	138	6	671	814	0	0	0	0	0	1.678	13.456	15.134	0	0	34	0	15.982
		Government	3	11.685	4.438	12.362	694	29.179	0	0	0	0	9.136	-496	8.639	-216	15.673	607	0	53.882	
		Others	4	1.825	622	1.544	146	4.137	0	0	0	0	1.559	3.212	4.770	0	0	68	0	8.975	
		Sum		14.044	6.876	42.574	6.289	69.783	0	0	0	0	57.088	40.224	97.312	-216	15.673	4.818	0	187.370	
	Capital Account	Households	5	8.321	0	0	0	8.321	0	0	47	175	222	0	0	0	0	0	285	-1.042	7.786
		Enterprises	6	0	9.038	0	0	9.038	0	0	1.183	0	1.183	0	0	0	0	0	329	9.375	19.925
		Government	7	0	0	781	0	781	115	40	3.390	5	3.550	0	0	0	0	0	1.497	3.348	9.175
		Others	8	0	0	0	2.628	2.628	0	0	319	175	494	0	0	0	0	0	39	-1.227	1.935
		Sum		8.321	9.038	781	2.628	20.767	115	40	4.939	356	5.449	0	0	0	0	0	2.150	10.455	38.821
PRODUCTION	Factors of Production	Labour	9	0	0	0	0	0	0	0	0	0	0	0	0	57.061	0	166	0	57.227	
		Capital	10	0	0	0	0	0	0	0	0	0	0	0	0	42.843	0	4.970	0	47.812	
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	99.904	0	5.135	0	105.039	
	Activities	11	0	0	0	0	0	0	0	0	0	0	0	0	0	223.324	0	0	0	223.324	
	Products	12	83.570	0	9.676	0	93.246	8.851	18.411	4.445	1.535	33.242	0	0	0	123.700	0	36.449	0	286.637	
REST OF THE WORLD	13	2.596	68	852	58	3.574	-1.179	1.474	-209	44	129	139	7.589	7.727	-64	47.640	X	0	59.007		
Errors and Omissions	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10.455	X	10.455		
TOTAL		108.531	15.982	53.882	8.975	187.370	7.786	19.925	9.175	1.935	38.821	57.227	47.812	105.039	223.324	286.637	59.007	10.455	X		

Source: Portuguese National Accounts



## Description of the SAM cell contents

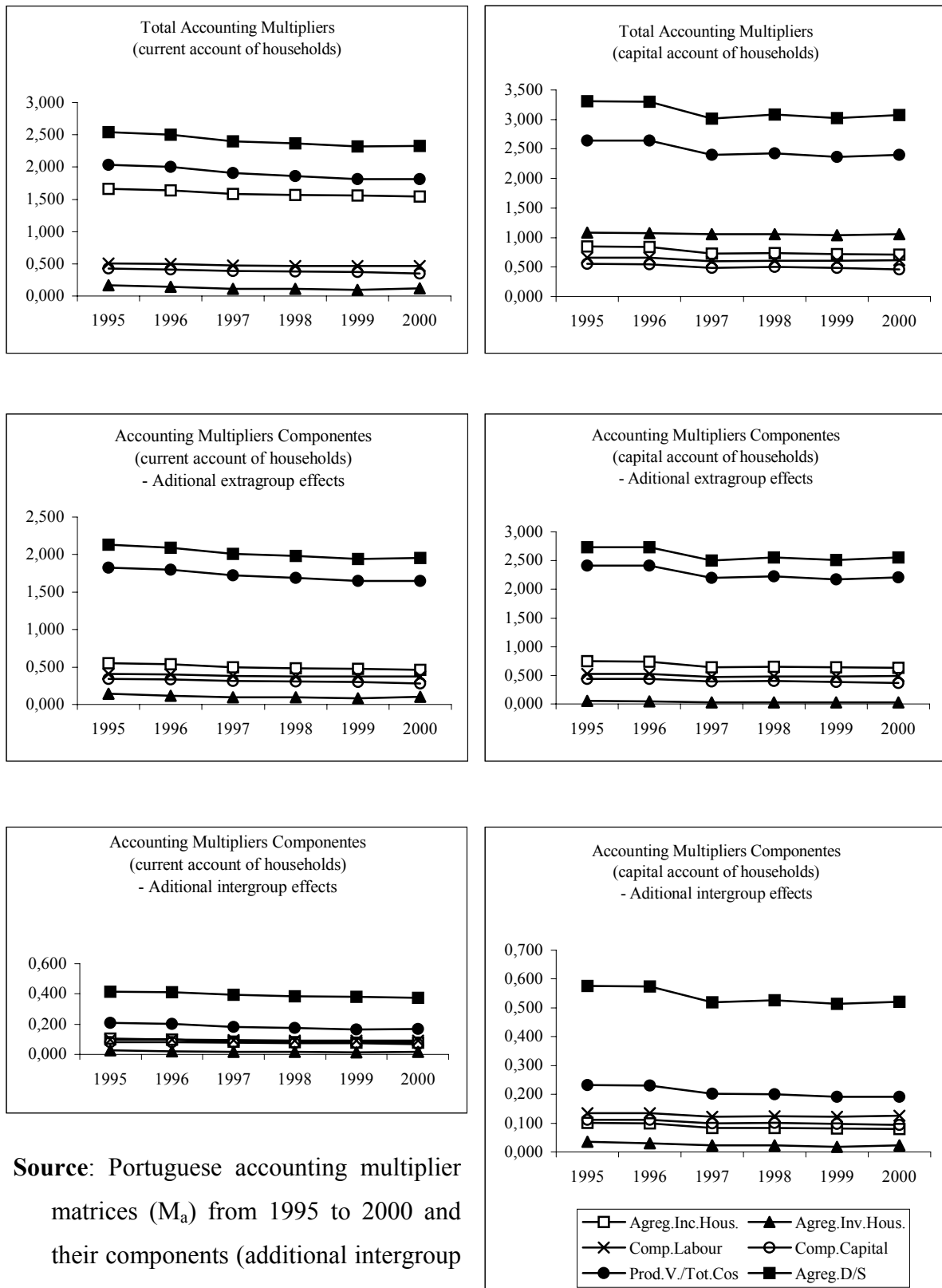
Row	Col.	Contents
1	1	Social benefits other than social transfers in kind and miscellaneous current transfers within households
1	2	Social benefits other than social transfers in kind and miscellaneous current transfers from non-financial corporations to households
1	3	Social benefits other than social transfers in kind, social transfers in kind and miscellaneous current transfers from government to households
1	4	Social benefits other than social transfers in kind received by households from financial corporations and non-profit institutions serving households; social transfers in kind from non-profit institutions serving households to households; non-life insurance claims from financial corporations to households; adjustment for the change in the net equity of households in pension funds
1	9	Wages and salaries plus imputed social contributions received by the households
1	10	Gross mixed income plus net property income received by the households
1	13	Social benefits other than social transfers in kind, non-life insurance claims and miscellaneous current transfers received by households from the rest of the world
2	2	Miscellaneous current transfers within non-financial corporations
2	3	Miscellaneous current transfers from government to non-financial corporations
2	4	Non-life insurance claims and miscellaneous current transfers from financial corporations to non-financial corporations
2	9	Imputed social contributions received by non-financial corporations
2	10	Gross operating surplus plus net property income received by non-financial corporations
2	13	Non-life insurance claims received by non-financial corporations from the rest of the world
3	1	Current taxes on income, wealth, etc., employees' social contributions, social contributions by self-employed and non-employed persons and miscellaneous current transfers received by government from households
3	2	Current taxes on income, wealth, etc., and miscellaneous current transfers received by government from non-financial corporations
3	3	Current transfers and miscellaneous current transfers within government
3	4	Current taxes on income, wealth, etc. paid by financial corporations and non-profit institutions serving households to government; non-life insurance claims paid by financial corporations to government; miscellaneous current transfers from financial corporations and non-profit institutions serving households to government
3	9	Imputed social contributions received by general government plus employers' actual social contributions received by social security funds
3	10	Gross operating surplus plus net property income received by general government

Row	Col.	Contents
3	11	Other taxes on production net of subsidies (on production)
3	12	Taxes on products paid by the national institutions net of subsidies (on products) received by the same institutions
3	13	Current international cooperation and miscellaneous current transfers received by government from the rest of the world
4	1	Employees' social contributions, social contributions by self-employed and non-employed persons and net non-life insurance premiums received by financial corporations from households; miscellaneous current transfers from households to non-profit institutions serving households
4	2	Net non-life insurance premiums received by financial corporations from non-financial corporations; miscellaneous current transfers from non-financial corporations to financial corporations and non-profit institutions serving households
4	3	Net non-life insurance premiums received by financial corporations from government; miscellaneous current transfers from government to non-profit institutions serving households
4	4	Net non-life insurance premiums paid by financial corporations and non-profit institutions serving households to financial corporations; non-life insurance claims paid by financial corporations to themselves and to non-profit institutions serving households; miscellaneous current transfers from financial corporations to non-profit institutions serving households and within the latter
4	9	Imputed social contributions received by financial corporations and non-profit institutions serving households
4	10	Gross operating surplus plus net property income received by financial corporations and non-profit institutions serving households
4	13	Net non-life insurance premiums and non-life insurance claims received by financial corporations from the rest of the world
5	1	Gross savings of households
5	7	Investment grants and other capital transfers from local government to households
5	8	Other capital transfers from financial corporations to households
5	13	Investment grants and other capital transfers from the rest of the world to households
5	14	Net lending (-)/borrowing (+) of households
6	2	Gross savings of non-financial corporations
6	7	Investment grants and other capital transfers from government to non-financial corporations
6	8	Other capital transfers from social security funds to non-financial corporations
6	13	Investment grants and other capital transfers from the rest of the world to non-financial corporations
6	14	Net lending (-)/borrowing (+) of non-financial corporations
7	3	Gross savings of government

Row	Col.	Contents
7	5	Capital taxes and other capital transfers received by government from households
7	6	Other capital transfers from non-financial corporations to government
7	7	Investment grants and other capital transfers within central government
7	8	Other capital transfers from financial corporations and non-profit institutions serving households to government
7	13	Investment grants and other capital transfers from the rest of the world to government
7	14	Net lending (-)/borrowing (+) of government
8	4	Gross savings of financial corporations and non-profit institutions serving households
8	6	Other capital transfers from non-financial corporations to financial corporations
8	7	Investment grants and other capital transfers from government to non-profit institutions serving households
8	8	Other capital transfers within financial corporations
8	13	Investment grants from the rest of the world to non-profit institutions serving households
8	14	Net lending (-)/borrowing (+) of financial corporations and non-profit institutions serving households
9	11	Compensation of employees paid by the activities
9	13	Compensation of employees paid by the rest of the world (from non-resident employers)
10	11	Gross operating surplus of activities
10	13	Property income paid by the rest of the world
11	12	Output of goods and services
12	1	Actual household final consumption
12	3	Actual government final consumption
12	5	Gross Capital Formation by the enterprises classified in the household institutional sector
12	6	Gross Capital Formation by non-financial corporations
12	7	Gross Capital Formation by government
12	8	Gross Capital Formation by financial corporations and non-profit institutions serving households
12	11	Intermediate consumption
12	13	Exports plus direct purchases in domestic market by non-residents and the c.i.f./f.o.b. adjustment
13	1	Net non-life insurance premiums and miscellaneous current transfers received by the rest of the world from households; direct purchases abroad by residents
13	2	Net non-life insurance premiums received by the rest of the world from

Row	Col.	Contents
		non-financial corporations
13	3	Net non-life insurance premiums, current international cooperation, miscellaneous current transfers and social benefits other than social transfers in kind received by the rest of the world from government
13	4	Net non-life insurance premiums received by the other countries of the rest of the world from financial corporations and non-profit institutions serving households; non-life insurance claims received by the rest of the world from financial corporations
13	5	Acquisitions minus disposals of non-produced non-financial assets and other capital transfers from households to the rest of the world
13	6	Acquisitions minus disposals of non-produced non-financial assets and other capital transfers from non-financial corporations to the rest of the world
13	7	Acquisitions minus disposals of non-produced non-financial assets, investment grants and other capital transfers from government to the rest of the world
13	8	Acquisitions minus disposals of non-produced non-financial assets from financial corporations to the rest of the world
13	9	Compensation of employees received by the rest of the world (paid to non-resident employees)
13	10	Property income received by the rest of the world
13	11	Minus other subsidies on production received, by activities, from the institutions and other countries of the European Union
13	12	Imports plus the part of taxes on products received by the institutions of the European Union net of the subsidies (on products) received from the same institutions
14	13	Net lending of the rest of the world /Net borrowing of the Portuguese economy

**Figure 1A:** Accounting multipliers and additional extragroup and intergroup components from 1995 to 2000



**Source:** Portuguese accounting multiplier matrices ( $M_a$ ) from 1995 to 2000 and their components (additional intergroup effects  $((M_2-I)*M_1)$  and additional extragroup effects  $((M_3-I)*M_2*M_1)$ ).