

***International Conference on Policy Modelling (EcoMod2003)***

***Istanbul, July 3-5, 2003***

**The Social Accounting Matrix as a working instrument for defining economic policy. Application in Portugal with emphasis on the general government sector**

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*(May 2003)*

## ABSTRACT

The study of the Social Accounting Matrix, usually known as SAM, arises from the need to place sectors within the general context of the economy, as well as the need to find out more about the effects of macroeconomic policies at the sectoral level and sectoral policies at the macroeconomic level.

Based on the principle that the study of a sector should be carried out under a general equilibrium approach, moving beyond the context of partial equilibrium, the SAM is one possibility for meeting such needs, in that it provides a complete account of the circular flow in the economy.

After presenting the general characteristics of their framework, three SAMs (1997-1999) will be constructed, with emphasis on the General Government sector. These will be created from the more recent data of the Portuguese System of National Accounts, the harmony between them both being demonstrated for the first year by identifying the identities and balances of the system's various internal accounts on the constructed matrix.

The modelling of the constructed SAMs will begin with the deduction and decomposition of accounting multipliers, which will be used to study the impact of Economic Policy measures, namely Budget Policy, on the Portuguese economy. Tests will be performed to check the veracity of the SAMs, using both accounting and fixed-price multipliers.

It will be concluded that the SAM is a working instrument providing a database that can be specially designed for specific economic analysis, as well as decision-making purposes.

*Key Words:* Social Accounting Matrix; Economic Planning; Economic Modelling; Economic Policy; Sectoral Studies; Macroeconomic Studies

*JEL Classification:* E66; O11; O50

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## 1. Introduction

The Social Accounting Matrix, usually known as SAM, is the working instrument used in this paper to study the effects on the economy of changes in the receipts of the different Portuguese government subsectors in 1998.

Compiled from the Portuguese System of National Accounts (SNA), the SAMs constructed for the Portuguese economy from 1997 to 1999 can be seen as its matrix representation (as will be shown in section 3), showing the entire circular flow of income. This particular method of accounting for economic activity 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 an 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 different goals. SAMs have been used to study income distribution and redistribution (e.g. Pyatt & Roe, 1977 and Keuning, 1996), growth strategies in developing economies (e.g. Pyatt & Round, 1985a and Robinson, 1986), the decomposition of activity multipliers that shed light on the circuits comprising the circular flow of income (e.g. Stone, 1981 and Pyatt & Round, 1985), as well as a combination of social, technological/environmental and economic issues (e.g. Resosudarmo & Thorbecke, 1996, Khan, 1997, Duchin<sup>1</sup>, 1998 and Alarcón & others, 2000).

In Portugal, studies have been undertaken using SAMs for 1974 (Norton & others, 1986), 1977 (Dionizio, 1983), from 1986 to 1997 (Santos, 1999, 2001 and 2003) and now for 1998 and 1999, also using 1997, this time with a test on the veracity of the results, an analysis of government flows and fixed-price multipliers calculated without estimated elasticities, which we have never seen treated before in an SAM framework.

As will be seen in section 2, square matrices will be used, in which each transaction is recorded only once in a cell of its own – it is conventionally agreed that the entries made in rows represent incomes or receipts, whilst the entries made in columns represent outlays or expenditures. These figures will include both production

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<sup>1</sup> Her very elucidating paper entitled "Global Environmental Degradation in the 21st Century: A Challenge for Input-Output Economics", presented at the *14th International Conference on Input-Output Techniques* (Montreal - Canada, October 2002), stresses the importance of the SAM framework.

and institutional accounts, which are subdivided into yet other accounts, defined in accordance with the goal of the study, as specified in the first paragraph. Thus, the constructed SAMs consist of a set of interrelated subsystems that, on the one hand, give an analytical picture of the Portuguese economy from 1997 to 1999 and, on the other hand, as will be seen in section 4, serve as an instrument for assessing the effects of changes in government receipts (injections into the system), which might be the result of policy measures. Section 5 ends the paper with a summary, largely of section 4, and some concluding remarks.

## **2. The Portuguese SAM structure**

The SAMs used here were constructed with the aim of studying the effects of changes in the Portuguese government's receipts. Other influences affecting their construction were the available data and previous experience in the construction of SAMs (Santos, 1999, 2001 and 2003), basically inspired by the works of Graham Pyatt and his associates (Pyatt, 1988 and 1991; Pyatt & Roe, 1977; Pyatt & Round, 1985).

Our concern was to adopt a mutually exclusive and, to some extent, exhaustive classification, so that in the disaggregation of the Portuguese SAM accounts we have: production, divided into factors of production, activities and products; and institutions, divided into current and capital accounts<sup>2</sup>. Besides the rest of the world account, an "errors and omissions" account was also considered, which assumes values that are perfectly justified by the national accounting system. We therefore respected, on the one hand, the functional criterion (describing the production processes and pointing out the existing technical-economic relationships between the various productive units) and, on the other hand, the institutional criterion (describing distribution, accumulation and financing activities and showing the relationships involved in economic behaviour). The criterion used for ordering the accounts was the one that underlies the "generic Portuguese SAM", presented in Table 1.

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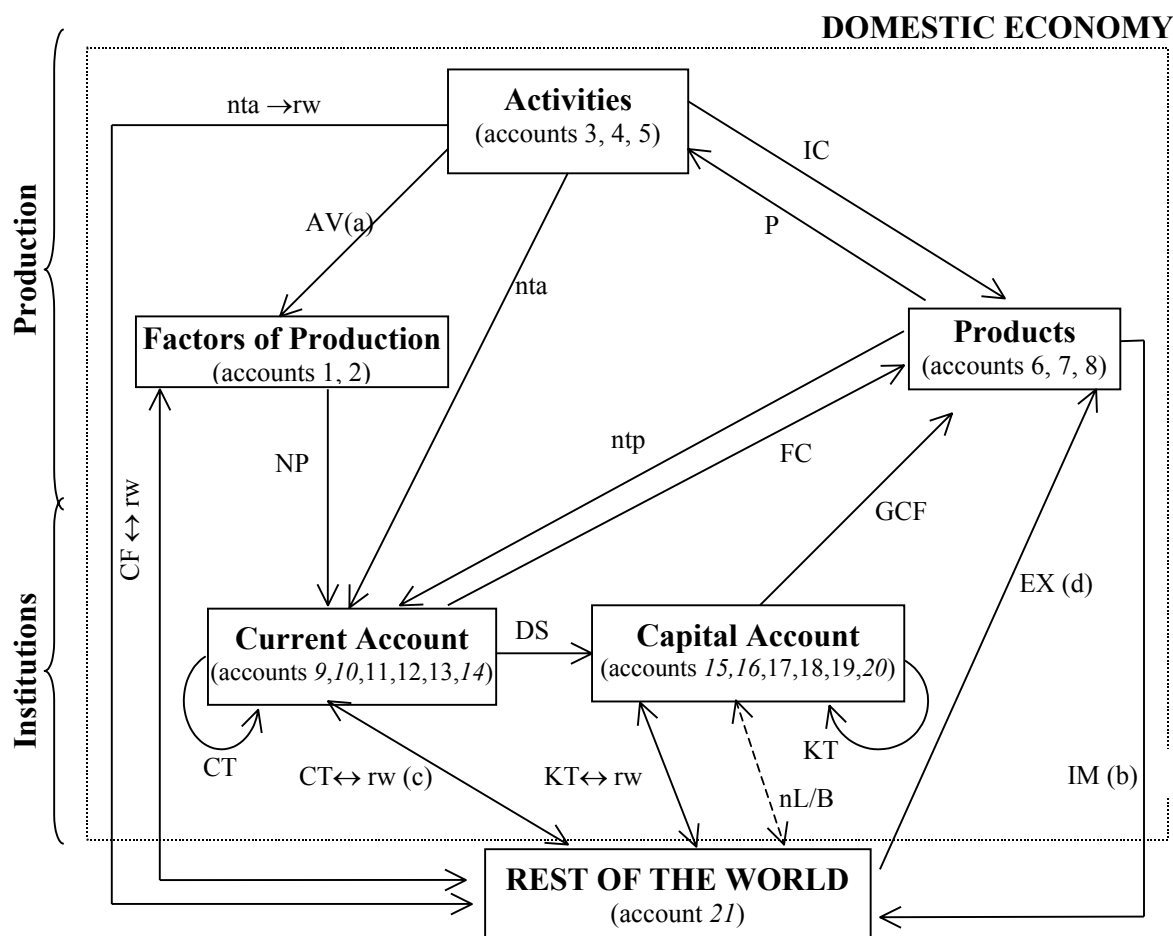
<sup>2</sup> In previous works, a financial account was also included. In this case, however, it was not possible to produce such an account due to a lack of available information.

Table 1. Generic Portuguese SAM

Outlays (expenditures)		Production			Institutions		Rest of the World (RW)	Errors and Omissions	TOTAL	
		Factors	Activities	Products	Current A.	Capital A.				
Incomes (receipts)		1, 2	3, 4, 5	6, 7, 8	9, ... 14	15, ... 20	21	22		
Production	Factors	1, 2	0	Added Value [AV]	0	0	0	Compensation of Factors from the RW [CF←rw]	0	Aggregate Factor income [CF]
	Activities	3, 4, 5	0	0	Production [P]	0	0	0	0	Production Value [P]
	Products	6, 7, 8	0	Intermediate Consumption [IC]	0	Final Consumption [FC]	Gross Capital Formation [GCF]	Exports [EX]	0	Aggregate Demand [D]
Institutions	Current Account	9, ... 14	National Product [NP]	Other net taxes on production [nta]	Net taxes on products [ntp]	Current Transfers [CT]	0	Current Transfers from the RW [CT←rw]	0	Aggregate Income [Inc]
	Capital Account	15, ... 20	0	0	0	Domestic Saving [DS]	Capital Transfers [KT]	Capital Transfers from the RW [KT←rw]	Net lending/ borrowing [nL/B]	Investment Funds [IF]
Rest of the World		21	Compensation of Factors to the RW [CF→rw]	Other net taxes on production [nta→rw]	Imports [IM]	Current Transfers to the RW [CT→rw]	Capital Transfers to the RW [KT→rw]		0	Transactions Value to the RW [TV→rw]
Errors and Omissions		22	0	0	Commercial Margins [cm]	0	0	Net lending / borrowing [nL/B]		Net lending/ borrowing [nL/B]
TOTAL			Aggregate Factor income [CF]	Total Costs [TC]	Aggregate Supply [S]	Aggregate Income [Inc]	Aggregate Investment [I]	Transactions Value from the RW [TV←rw]	Net lending / borrowing [nL/B]	

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 Outline 1, where, following the flows of money, the connections that can be established between the various Portuguese SAM accounts are represented.

Outline 1: Flows of money between the generic 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 Table 1 for the meaning of the flows.

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).

The SAM therefore offers a more or less disaggregated view of value flows, detailing the direct linkages between accounts, but also indicating the scope of the underlying indirect interactions. For instance, inflows from exogenous accounts that stimulate the level of activity of a production sector will also induce additional factor income that, once distributed among households, will be used to finance a new final demand for producer goods and services (Roland-Holst & Sancho, 1995).

As is shown by the numbers of the accounts, further disaggregation was undertaken of the framework described above, always respecting the National Accounts Nomenclature. So, in the constructed matrices, Tables 2, 3 and 4 (see the description of their cell contents in the annex), the factors of production were disaggregated into labour and capital, whilst the activities and products accounts were disaggregated into primary, secondary and tertiary groups<sup>3</sup>. On the other hand, the current and capital accounts of institutions were divided into households, enterprises (non-financial corporations), central and local government and social security funds (which constitute the general government), and other institutions (financial corporations and non-profit institutions serving households).

Because particular attention was being given to the general government flows, advantage was taken of a crucial feature of the SAM, i.e. the wide range of possibilities that it offers for expanding or condensing it in accordance with specific circumstances and needs (ISWG, 1993, paragraph 20.6), without, however, losing sight of the consistency of the whole system.

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<sup>3</sup> The primary group includes agriculture, forestry and fishing (activities/products 01 to 05 of the National Accounts System). The secondary group includes industry, which in turn includes energy and construction (activities/products 10 to 45 of the National Accounts System). The tertiary group includes the rest of the economy (activities/products 50 to 95 of the National Accounts System).



**Table 2. Portuguese Social Accounting Matrix for 1997 (in millions of euros)**

Outlays (Expenditures)		PRODUCTION											INSTITUTIONS				
		Factors of Production			Activities				Products				Current Account				
		Labour	Capital	Sum	Primary	Secondary	Tertiary	Sum	Primary	Secondary	Tertiary	Sum	Households	Enterprises	Gov(Central)		
Incomes(Receipts)		1	2	Sum	3	4	5	Sum	6	7	8	Sum	9	10	11		
PRODUCTION	Factors of Production	Labour	1	0	0	0	640	13.788	30.157	44.585	0	0	0	0	0	0	0
		Capital	2	0	0	0	3.058	11.828	21.750	36.635	0	0	0	0	0	0	0
		Sum		0	0	0	3.697	25.615	51.907	81.220	0	0	0	0	0	0	0
	Activities	Primary	3	0	0	0	0	0	0	0	5.965	391	19	6.376	0	0	0
		Secondary	4	0	0	0	0	0	0	0	0	80.396	587	80.983	0	0	0
		Tertiary	5	0	0	0	0	0	0	0	4	208	92.062	92.274	0	0	0
		Sum		0	0	0	0	0	0	0	5.970	80.995	92.668	179.633	0	0	0
	Products	Primary	6	0	0	0	583	4.843	479	5.905	0	0	0	0	2.634	0	16
		Secondary	7	0	0	0	1.935	44.150	14.774	60.859	0	0	0	0	31.304	0	658
		Tertiary	8	0	0	0	317	6.428	25.333	32.078	0	0	0	0	33.158	0	4.208
		Sum		0	0	0	2.835	55.421	40.586	98.842	0	0	0	0	67.097	0	4.883
	INSTITUTIONS	Current Account	Households	9	35.157	20.991	56.149	0	0	0	0	0	0	0	0	451	1.465
Enterprises			10	1.457	13.042	14.500	0	0	0	0	0	0	0	0	0	78	2
Gov(Central)			11	607	-1.834	-1.227	-88	-6	-341	-435	1	7.815	2.931	10.748	5.552	2.751	5.338
Gov(Local)			12	45	804	850	-3	75	265	338	-6	598	222	814	226	223	886
Gov(SSF)			13	6.224	104	6.329	-6	-120	-143	-269	5	323	123	452	3.471	20	1.791
Others			14	1.118	2.317	3.436	0	0	0	0	0	0	0	0	1.687	516	562
Sum				44.610	35.426	80.035	-96	-50	-219	-366	1	8.737	3.276	12.014	11.387	5.053	19.067
Capital Account		Households	15	0	0	0	0	0	0	0	0	0	0	0	6.417	0	0
		Enterprises	16	0	0	0	0	0	0	0	0	0	0	0	0	9.961	0
		Gov(Central)	17	0	0	0	0	0	0	0	0	0	0	0	0	0	-565
		Gov(Local)	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Gov(SSF)	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Others	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum			0	0	0	0	0	0	0	0	0	0	0	6.417	9.961	-565	
REST OF THE WORLD		21	101	4.707	4.808	-60	-3	0	-63	1.685	28.647	3.841	34.173	1.845	46	500	
Errors and Omissions		22	0	0	0	0	0	0	0	1.309	17.500	-18.809	0	0	0	0	
TOTAL			44.711	40.133	84.843	6.376	80.983	92.274	179.633	8.965	135.878	80.976	225.819	86.745	15.060	23.885	

Source: Portuguese National Accounts

**Table 2.** Portuguese Social Accounting Matrix for 1997 (in millions of euros) (continued)

Outlays (Expenditures)				INSTITUTIONS										REST OF THE WORLD	Errors and Omissions	TOTAL		
				Current Account				Capital Account										
Incomes(Receipts)				Gov(Local)	Gov(SSF)	Others	Sum	Households	Entreprises	Gov(Central)	Gov(Local)	Gov(SSF)	Others	Sum	21	22		
				12	13	14		15	16	17	18	19	20	Sum				
PRODUCTION	Factors of Production	Labour	1	0	0	0	0	0	0	0	0	0	0	0	126	0	44.711	
		Capital	2	0	0	0	0	0	0	0	0	0	0	0	3.497	0	40.133	
		Sum		0	0	0	0	0	0	0	0	0	0	0	3.623	0	84.843	
	Activities	Primary	3	0	0	0	0	0	0	0	0	0	0	0	0	0	6.376	
		Secondary	4	0	0	0	0	0	0	0	0	0	0	0	0	0	80.983	
		Tertiary	5	0	0	0	0	0	0	0	0	0	0	0	0	0	92.274	
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	0	179.633	
	Products	Primary	6	3	0	0	2.654	134	4	1	1	0	0	140	265	0	8.965	
		Secondary	7	130	17	0	32.110	5.560	10.461	1.964	2.049	22	1.331	21.387	21.523	0	135.878	
		Tertiary	8	1.937	244	0	39.547	836	1.807	6	7	0	192	2.848	6.503	0	80.976	
		Sum		2.070	261	0	74.311	6.530	12.272	1.972	2.057	22	1.523	24.376	28.291	0	225.819	
	INSTITUTIONS	Current Account	Households	9	860	10.177	3.885	27.326	0	0	0	0	0	0	0	3.270	0	86.745
			Entreprises	10	2	0	460	542	0	0	0	0	0	0	0	18	0	15.060
			Gov(Central)	11	7	609	404	14.661	0	0	0	0	0	0	0	138	0	23.885
Gov(Local)			12	418	10	35	1.798	0	0	0	0	0	0	0	23	0	3.823	
Gov(SSF)			13	0	0	0	5.281	0	0	0	0	0	0	0	376	0	12.169	
Others			14	161	409	117	3.452	0	0	0	0	0	0	0	43	0	6.931	
Sum				1.447	11.205	4.901	53.061	0	0	0	0	0	0	0	3.869	0	148.613	
Capital Account		Households	15	0	0	0	6.417	0	0	290	17	0	96	403	184	-941	6.063	
		Entreprises	16	0	0	0	9.961	0	0	1.021	98	0	0	1.120	1.056	1.060	13.197	
		Gov(Central)	17	0	0	0	-565	72	36	1.126	8	519	5	1.766	1.112	3.366	5.679	
		Gov(Local)	18	306	0	0	306	8	32	914	164	0	4	1.122	530	429	2.387	
		Gov(SSF)	19	0	660	0	660	254	0	23	0	0	0	277	120	-470	587	
		Others	20	0	0	1.956	1.956	0	0	251	67	46	96	460	2	-694	1.724	
		Sum		306	660	1.956	18.734	334	69	3.625	355	565	201	5.148	3.005	2.750	29.637	
REST OF THE WORLD		21	0	43	73	2.507	-800	856	82	-25	0	1	114	X	0	41.538		
Errors and Omissions		22	0	0	0	0	0	0	0	0	0	0	0	2.750	X	2.750		
TOTAL				3.823	12.169	6.931	148.613	6.063	13.197	5.679	2.387	587	1.724	29.637	41.538	2.750	X	

Source: Portuguese National Accounts

**Table 3. Portuguese Social Accounting Matrix for 1998 (in millions of euros)**

Outlays (Expenditures)				PRODUCTION										INSTITUTIONS					
				Factors of Production			Activities				Products				Current Account				
				Labour	Capital	Sum	Primary	Secondary	Tertiary	Sum	Primary	Secondary	Tertiary	Sum	Households	Enterprises	Gov(Central)		
Incomes(Receipts)				1	2		3	4	5		6	7	8		9	10	11		
PRODUCTION	Factors of Production	Labour	1	0	0	0	652	14.895	32.718	48.266	0	0	0	0	0	0	0	0	
		Capital	2	0	0	0	3.093	12.371	24.086	39.551	0	0	0	0	0	0	0	0	
		Sum		0	0	0	3.745	27.266	56.805	87.816	0	0	0	0	0	0	0	0	
	Activities	Primary	3	0	0	0	0	0	0	0	6.048	318	23	6.389	0	0	0	0	
		Secondary	4	0	0	0	0	0	0	0	0	84.628	700	85.328	0	0	0	0	
		Tertiary	5	0	0	0	0	0	0	0	5	222	100.617	100.844	0	0	0	0	
		Sum		0	0	0	0	0	0	0	6.053	85.168	101.340	192.561	0	0	0	0	
	Products	Primary	6	0	0	0	599	4.754	500	5.853	0	0	0	0	2.884	0	0	0	
		Secondary	7	0	0	0	1.860	46.203	15.766	63.829	0	0	0	0	34.331	0	712	0	
		Tertiary	8	0	0	0	353	7.233	28.135	35.721	0	0	0	0	35.229	0	4.430	0	
		Sum		0	0	0	2.812	58.190	44.401	105.403	0	0	0	0	72.444	0	5.142	0	
	INSTITUTIONS	Current Account	Households	9	37.965	22.157	60.121	0	0	0	0	0	0	0	0	482	1.578	11.567	0
Enterprises			10	1.578	13.737	15.315	0	0	0	0	0	0	0	0	0	123	1	0	
Gov(Central)			11	701	-1.571	-870	-157	-120	-338	-616	-223	8.954	3.409	12.140	5.840	2.854	5.855	0	
Gov(Local)			12	47	888	935	106	81	228	415	-18	728	277	987	234	241	922	0	
Gov(SSF)			13	6.858	100	6.958	-103	-79	-221	-403	-9	350	133	475	3.661	24	1.901	0	
Others			14	1.186	2.806	3.992	0	0	0	0	0	0	0	0	1.630	483	568	0	
Sum				48.335	38.116	86.451	-154	-118	-332	-604	-250	10.032	3.820	13.602	11.847	5.303	20.815	0	
Capital Account		Households	15	0	0	0	0	0	0	0	0	0	0	0	6.667	0	0	0	
		Enterprises	16	0	0	0	0	0	0	0	0	0	0	0	0	10.572	0	0	
		Gov(Central)	17	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	0	
		Gov(Local)	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Gov(SSF)	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		Others	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sum			0	0	0	0	0	0	0	0	0	0	0	6.667	10.572	-2	0		
REST OF THE WORLD			21	84	5.424	5.508	-14	-11	-30	-54	2.142	33.598	2.759	38.499	2.150	54	611	0	
Errors and Omissions			22	0	0	0	0	0	0	0	1.391	17.568	-18.959	0	0	0	0	0	
TOTAL					48.419	43.540	91.959	6.389	85.328	100.844	192.561	9.336	146.366	88.960	244.662	93.108	15.930	26.566	0

Source: Portuguese National Accounts

**Table 3.** Portuguese Social Accounting Matrix for 1998 (in millions of euros) (continued)

Outlays (Expenditures)			INSTITUTIONS												REST OF THE WORLD	Errors and Omissions	TOTAL
			Current Account				Capital Account										
			Gov(Local)	Gov(SSF)	Others	Sum	Households	Enterprises	Gov(Central)	Gov(Local)	Gov(SSF)	Others	Sum				
Incomes(Receipts)			12	13	14		15	16	17	18	19	20		21	22		
PRODUCTION	Factors of Production	Labour	1	0	0	0	0	0	0	0	0	0	0	0	153	0	48.419
		Capital	2	0	0	0	0	0	0	0	0	0	0	0	3.989	0	43.540
		Sum		0	0	0	0	0	0	0	0	0	0	0	4.143	0	91.959
	Activities	Primary	3	0	0	0	0	0	0	0	0	0	0	0	0	0	6.389
		Secondary	4	0	0	0	0	0	0	0	0	0	0	0	0	0	85.328
		Tertiary	5	0	0	0	0	0	0	0	0	0	0	0	0	0	100.844
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	0	192.561
	Products	Primary	6	0	0	0	2.884	187	151	0	0	0	0	338	261	0	9.336
		Secondary	7	141	19	0	35.202	6.291	12.538	1.871	2.055	49	1.394	24.198	23.136	0	146.366
		Tertiary	8	2.125	277	0	42.062	1.002	2.216	4	4	0	212	3.438	7.739	0	88.960
		Sum		2.266	297	0	80.149	7.480	14.905	1.875	2.060	49	1.606	27.975	31.136	0	244.662
	INSTITUTIONS	Current Account	Households	9	898	11.048	3.958	29.532	0	0	0	0	0	0	0	3.455	0
Enterprises			10	5	0	465	594	0	0	0	0	0	0	0	20	0	15.930
Gov(Central)			11	8	672	498	15.727	0	0	0	0	0	0	0	185	0	26.566
Gov(Local)			12	460	11	46	1.913	0	0	0	0	0	0	0	19	0	4.270
Gov(SSF)			13	0	0	0	5.587	0	0	0	0	0	0	0	716	0	13.332
Others			14	167	474	115	3.437	0	0	0	0	0	0	0	77	0	7.506
Sum				1.536	12.205	5.083	56.789	0	0	0	0	0	0	0	4.473	0	160.711
Capital Account		Households	15	0	0	0	6.667	0	0	217	21	0	220	459	196	-675	6.648
		Enterprises	16	0	0	0	10.572	0	0	1.171	115	6	0	1.292	1.152	2.911	15.928
		Gov(Central)	17	0	0	0	-2	84	30	1.175	12	599	4	1.904	897	3.729	6.529
		Gov(Local)	18	467	0	0	467	8	27	1.677	170	0	4	1.886	514	-404	2.463
		Gov(SSF)	19	0	784	0	784	0	0	27	0	0	0	27	20	-125	706
		Others	20	0	0	2.315	2.315	0	0	287	81	52	220	640	3	-928	2.029
		Sum		467	784	2.315	20.804	92	57	4.553	399	657	449	6.208	2.782	4.508	34.303
REST OF THE WORLD			21	0	46	108	2.969	-924	966	100	4	0	-26	120	X	0	47.042
Errors and Omissions			22	0	0	0	0	0	0	0	0	0	0	4.508	X	0	4.508
TOTAL				4.270	13.332	7.506	160.711	6.648	15.928	6.529	2.463	706	2.029	34.303	47.042	4.508	X

Source: Portuguese National Accounts

**Table 4.** Portuguese Social Accounting Matrix for 1999 (in millions of euros)

Outlays (Expenditures)				PRODUCTION										INSTITUTIONS			
				Factors of Production			Activities				Products				Current Account		
Incomes(Receipts)				Labour	Capital	Sum	Primary	Secondary	Tertiary	Sum	Primary	Secondary	Tertiary	Sum	Households	Enterprises	Gov(Central)
				1	2		3	4	5		6	7	8		9	10	11
PRODUCTION	Factors of Production	Labour	1	0	0	0	650	15.691	35.751	52.092	0	0	0	0	0	0	0
		Capital	2	0	0	0	3.142	12.740	25.734	41.615	0	0	0	0	0	0	0
		Sum		0	0	0	3.792	28.431	61.484	93.707	0	0	0	0	0	0	0
	Activities	Primary	3	0	0	0	0	0	0	0	6.196	362	26	6.584	0	0	0
		Secondary	4	0	0	0	0	0	0	0	0	87.369	763	88.133	0	0	0
		Tertiary	5	0	0	0	0	0	0	0	8	281	108.609	108.898	0	0	0
		Sum		0	0	0	0	0	0	0	6.204	88.012	109.398	203.614	0	0	0
	Products	Primary	6	0	0	0	751	4.549	502	5.802	0	0	0	0	2.942	0	0
		Secondary	7	0	0	0	1.846	47.615	16.703	66.165	0	0	0	0	36.680	0	786
		Tertiary	8	0	0	0	400	7.739	30.696	38.835	0	0	0	0	38.732	0	4.846
		Sum		0	0	0	2.997	59.903	47.901	110.801	0	0	0	0	78.353	0	5.631
	INSTITUTIONS	Current Account	Households	9	41.242	22.389	63.631	0	0	0	0	0	0	0	0	520	1.550
Enterprises			10	1.550	15.229	16.779	0	0	0	0	0	0	0	0	0	134	2
Gov(Central)			11	739	-1.655	-916	-174	-171	-413	-758	-229	9.596	3.968	13.334	6.240	3.458	6.619
Gov(Local)			12	51	988	1.039	106	103	251	459	-21	863	357	1.199	283	310	1.133
Gov(SSF)			13	7.385	109	7.494	-122	-120	-291	-533	-8	354	146	492	3.991	22	2.180
Others			14	1.154	2.971	4.125	0	0	0	0	0	0	0	0	1.650	507	599
Sum			52.120	40.032	92.152	-191	-187	-454	-832	-258	10.813	4.471	15.025	12.685	5.981	23.336	
Capital Account		Households	15	0	0	0	0	0	0	0	0	0	0	0	5.915	0	0
		Enterprises	16	0	0	0	0	0	0	0	0	0	0	0	0	11.399	0
		Gov(Central)	17	0	0	0	0	0	0	0	0	0	0	0	0	0	-106
		Gov(Local)	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Gov(SSF)	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Others	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum			0	0	0	0	0	0	0	0	0	0	0	5.915	11.399	-106	
REST OF THE WORLD		21	119	5.559	5.678	-14	-14	-34	-63	1.936	36.829	2.936	41.700	2.261	62	727	
Errors and Omissions		22	0	0	0	0	0	0	0	1.482	18.179	-19.662	0	0	0	0	
TOTAL				52.239	45.590	97.829	6.584	88.133	108.898	203.614	9.364	153.833	97.143	260.340	99.214	17.443	29.588

Source: Portuguese National Accounts

**Table 4. Portuguese Social Accounting Matrix for 1999 (in millions of euros)(continued)**

Outlays (Expenditures)				INSTITUTIONS										REST OF THE WORLD	Errors and Omissions	TOTAL	
				Current Account				Capital Account									
				Gov(Local)	Gov(SSF)	Others	Sum	Households	Entreprises	Gov(Central)	Gov(Local)	Gov(SSF)	Others				Sum
Incomes(Receipts)				12	13	14		15	16	17	18	19	20		21	22	
PRODUCTION	Factors of Production	Labour	1	0	0	0	0	0	0	0	0	0	0	0	147	0	52.239
		Capital	2	0	0	0	0	0	0	0	0	0	0	0	3.975	0	45.590
		Sum		0	0	0	0	0	0	0	0	0	0	0	4.122	0	97.829
	Activities	Primary	3	0	0	0	0	0	0	0	0	0	0	0	0	0	6.584
		Secondary	4	0	0	0	0	0	0	0	0	0	0	0	0	0	88.133
		Tertiary	5	0	0	0	0	0	0	0	0	0	0	0	0	0	108.898
		Sum		0	0	0	0	0	0	0	0	0	0	0	0	0	203.614
	Products	Primary	6	0	0	0	2.942	219	133	0	0	0	0	352	269	0	9.364
		Secondary	7	158	22	0	37.646	6.725	13.601	2.085	2.297	63	1.453	26.224	23.798	0	153.833
		Tertiary	8	2.386	312	0	46.276	1.241	2.564	17	18	1	168	4.009	8.023	0	97.143
		Sum		2.545	335	0	86.864	8.185	16.298	2.102	2.315	64	1.621	30.585	32.089	0	260.340
	INSTITUTIONS	Current Account	Households	9	1.017	11.993	4.053	31.936	0	0	0	0	0	0	0	3.647	0
Entreprises			10	1	0	517	653	0	0	0	0	0	0	0	11	0	17.443
Gov(Central)			11	8	698	603	17.627	0	0	0	0	0	0	0	302	0	29.588
Gov(Local)			12	397	12	57	2.192	0	0	0	0	0	0	0	24	0	4.914
Gov(SSF)			13	0	0	0	6.193	0	0	0	0	0	0	0	762	0	14.407
Others			14	209	541	115	3.622	0	0	0	0	0	0	0	81	0	7.828
Sum				1.632	13.244	5.345	62.222	0	0	0	0	0	0	0	4.827	0	173.394
Capital Account		Households	15	0	0	0	5.915	0	0	236	23	0	313	572	266	552	7.305
		Entreprises	16	0	0	0	11.399	0	0	1.150	133	0	0	1.282	1.019	3.719	17.420
		Gov(Central)	17	0	0	0	-106	95	31	1.300	12	610	3	2.051	1.160	3.519	6.623
		Gov(Local)	18	737	0	0	737	8	24	1.553	199	0	4	1.787	523	-283	2.765
		Gov(SSF)	19	0	773	0	773	0	36	30	0	0	0	66	36	-137	739
		Others	20	0	0	2.425	2.425	0	0	195	87	62	313	657	4	-800	2.285
		Sum		737	773	2.425	21.143	103	91	4.463	454	671	633	6.416	3.009	6.570	37.138
REST OF THE WORLD		21	0	55	59	3.165	-982	1.031	58	-5	4	31	137	X	0	50.617	
Errors and Omissions		22	0	0	0	0	0	0	0	0	0	0	0	6.570	X	6.570	
TOTAL			4.914	14.407	7.828	173.394	7.305	17.420	6.623	2.765	739	2.285	37.138	50.617	6.570	X	

Source: Portuguese National Accounts

### 3. Association with the System of National Accounts

Because the National Accounts were the base information source of the constructed SAMs, almost all the flows that are part of that system are integrated into them.

The System of National Accounts adopted in Portugal in 1997-99, the years for which we constructed the SAMs, was the 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 United Nations System of National Accounts - SNA 93, prepared by the Inter-Secretariat Working Group and published by the United Nations Statistical Office (ISWG, 1993). According to the latter group, "a SAM is defined as the presentation of SNA accounts in a matrix which elaborates the linkages between a supply and use table and institutional sector accounts" (ISWG, 1993, paragraph 20.4).

Next we will indicate the identities and balances of the several accounts of the Portuguese System of National Accounts in the constructed SAM for 1997 (an identical treatment can be given to the SAMs for 1998 and 1999), each of them referring to an aspect of the economic circuit. For uses and resources, always expressed in millions of euros, we will use the designations that we used for the various accounts of the SAM. We will add a " ' " to our balances.

We will use gross balances, therefore not taking into account the consumption of fixed capital, and work - at current prices – with the goods and services account, the current accounts and the capital account of the accumulation accounts.

Goods and Services Account - balanced by definition:

#### *Resources*

Output of goods and services .....	179 630
Imports of goods and services .....	35 490
Taxes on products net of subsidies .....	12 223
Total.....	227 346

#### *Uses*

Intermediate consumption .....	98 842
Final consumption expenditure/ actual final consumption.....	75 838
Gross capital formation .....	24 376
Exports of goods and services .....	28 291
Total.....	227 346

This account can be associated with the SAM's "Products" account, which belongs to the group of "Production" accounts.

Thus:

*Resources*

Intermediate consumption .....	98 842
Final consumption expenditure/ actual final consumption of the national institutions in the economy .....	74 311
Gross capital formation .....	24 376
Exports of goods and services .....	28 291
Aggregate demand.....	225 819

*Uses*

Output of goods and services .....	179 633
Taxes on products received by the national institutions net of subsidies.....	12 014
Imports of goods and services plus taxes less subsidies on products received by the European Union institutions .....	34 173
Aggregate supply.....	225 819

The difference between both accounts is in the “direct purchases abroad by residents” (1 527), considered in the SAM as a “current transfer to the rest of the world”.

Production Account - which describes the transactions that constitute the appropriately named production process:

*Resources*

Output of goods and services .....	179 633
Taxes on products net of subsidies.....	12 223
Total.....	191 856

*Uses*

Intermediate Consumption .....	98 842
(B1g) Gross added value/gross domestic product .....	93 014
Total.....	191 856

We associated this account with the "Activities" account:

*Resources*

Output of goods and services .....	179 633
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*Uses*

Intermediate consumption .....	98 842
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Taxes on production net of subsidies .....	- 429	
- receipt/expenditure of the (Portuguese) General Government .....	-366	
- receipt/expenditure of the Institutions of the European Union .....		-63
(B1g') Gross added value .....	81 220	
Total costs (net of subsidies to production).....	179 633	

We therefore have a gross added value (B1g') corresponding to gross domestic product at market prices (B1g) minus net indirect taxes (on products and production). In other words, gross added value at factor cost ( $81\,220 = 93\,014 - (12\,223 - 429)$ ).

Primary Distribution of Income Accounts – which show how primary incomes (i.e. incomes that accrue as a result of the involvement in processes of production or through the ownership of assets that may be needed for production purposes) are distributed among institutions and activities:

- Generation of income account

*Resources*

(B1g) Gross added value/gross domestic product .....	93 014
--	--------

*Uses*

Compensation of employees paid by national institutions .....	44 585
Taxes on production and imports paid by national institutions.....	13 491
Subsidies received by national institutions.....	- 1 696
(B2g + B3g) Gross operating surplus + Gross mixed income .....	36 635
Total.....	93 014

- Allocation of primary income account

*Resources*

(B2g + B3g) Gross operating surplus + Gross mixed income .....	36 635
Compensation of employees received by national institutions .....	44 610
Taxes on production and imports received by national institutions.....	12 799
Subsidies paid by national institutions .....	- 1 152
Property income received by national institutions .....	26 411
Total .....	119 303

*Uses*

Property income paid by national institutions .....	27 620
(B5g) Gross national income .....	91 683
Total .....	119 303

We can associate these accounts with the SAM's "Factors of Production" account, which has the following form:

*Resources*

Compensation of employees (labour).....	44 711
- Paid by national institutions .....	44 585
- " by the rest of the world .....	126
Compensation of capital .....	40 133
- (B2g' + B3g') Gross operating surplus + Gross mixed income .....	36 635
- Paid by the rest of the world .....	3 497
Aggregate Income of Factors .....	84 843

*Uses*

Compensation of employees (labour).....	44 711
- Received by national institutions .....	44 610
- " by the rest of the world .....	101
Compensation of capital .....	40 133
- Received by national institutions .....	35 426
- " by the rest of the world .....	4 707
Aggregate Income of Factors .....	84 843

In establishing the connection between these accounts, we have:

National product (B5g') = compensation of employees received by national institutions + compensation of capital received by national institutions  $\Leftrightarrow$  Gross national income (B5g) – (taxes on production and imports received by national institutions – subsidies paid by national institutions).

That is to say:

$$80\,035 = 44\,610 + 35\,426 \Leftrightarrow 91\,683 - (12\,799 - 1152).$$

On the other hand:

Compensation of capital received by national institutions = Gross operating surplus + Gross mixed income (B2g' + B3g' = B2g + B3g) + compensation of capital (or property income) paid by the rest of the world - compensation of capital (or property income) received by the rest of the world.

That is to say:

$$35\,426 = 36\,635 + 3497 - 4707$$

Secondary Distribution of Income, Redistribution of Income in Kind and Use of Disposable Income Accounts. The first two accounts show how the balance of primary incomes (national income) is transformed into disposable income through the receipt

and payment of current transfers; the third one shows how gross disposable income is distributed between final consumption and saving.

- Secondary distribution of income and redistribution of income accounts

*Resources*

(B5g) Gross national income.....	91 683
Current taxes on income, wealth, etc., received by national institutions .....	8 925
Social contributions and benefits, received by national institutions .....	38 917
- Social contributions .....	13 668
- Social benefits other than social transfers in kind .....	13 298
- Social transfers in kind .....	11 951
Other current transfers, received by national institutions.....	17 784
Total .....	157 309

*Uses*

Current taxes on income, wealth, etc., paid by national institutions .....	8 925
Social contributions and benefits, paid by national institutions .....	38 924
- Social contributions .....	13 668
- Social benefits other than social transfers in kind .....	13 305
- Social transfers in kind .....	11 951
Other current transfers, paid by national institutions .....	14 887
(B6/7g) Gross disposable income .....	94 572
Total .....	157 309

- Use of disposable income account

*Resources*

(B6/7g) Gross disposable income .....	94 572
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*Uses*

Final consumption .....	75 838
(B8g) Gross saving .....	18 734
Total .....	94 572

Here is the SAM “Current” account for Institutions:

*Resources*

(B5g') National Product.....	80 035
- compensation of employees ...	44 610
- compensation of capital .....	35 426
Taxes on production paid to national institutions net of subsidies .....	- 366
Taxes on products paid to national institutions net of subsidies .....	12 014
Current transfers within national institutions .....	53 061
Current transfers from the rest of the world .....	3 869
Aggregate income.....	148 613

*Uses*

Final consumption in the economy.....	74 311
Current transfers within national institutions .....	53 061
Current transfers to the rest of the world.....	2 507
- current transfers to the rest of the world ...	980
- direct purchases abroad by residents .....	1 527
(B8g') Domestic saving .....	18 734
Aggregate income.....	148 613

We have, on the one hand, the SAM's saving (B8g'), which we have called domestic saving, equivalent to gross saving (B8g) and, on the other hand, the total of the SAM current account, which we have named aggregate income, corresponding to the sum of the items:

gross national income (B5g) + current transfers within national institutions + current transfers from the rest of the world (148 613 = 91 683 + 53 061 + 3 869)

or

gross disposable income (B6/7g) + current transfers within national institutions + current transfers to the rest of the world (148 613 = 94 572 + 53 061 + 980)

Capital Account – this records non-financial investment transactions and capital transfers that are considered to derive from property transactions:

*Resources*

(B8g) Gross saving .....	18 734
Capital transfers received by national institutions .....	8 153
Total.....	26 887

*Uses*

Gross capital formation .....	24 376
Capital transfers paid by national institutions .....	5 281
Acquisitions less disposals of non-produced non-financial assets .....	- 20
(B9) Net borrowing .....	- 2 750
Total.....	26 887

We have the following SAM "Capital" account:

*Resources*

(B8g') Domestic saving .....	18 734
Capital transfers within national institutions .....	5 148
Capital transfers from the rest of the world.....	3 005
(B9') Net borrowing .....	2 750
Investment Funds.....	29 637

<i>Uses</i>	
Gross Capital Formation.....	24 376
Capital transfers within national institutions.....	5 148
Capital transfers to the rest of the world .....	114
- capital transfers .....	133
- acquisitions less disposals of non-produced non-financial assets .....	-20
Aggregate Investment.....	29 637

The difference between the mathematical signs of B9 and B9' has to do only with the composition of both accounts and whether capital transfers are as a use or as a resource.

As can be seen, there is a very close relationship between both capital accounts, the difference between them being only the value of the net lending/borrowing.

Generally speaking, if it were not for the taxation on production, the association of SAM accounts with national accounts would be perfect.

#### 4. SAM Modelling

##### 4.1. Methodology

An analysis will be made of the demand-driven economy, in order to evaluate changes in government receipts.

As described below, the base methodology of the multipliers will be used, in keeping with the work of G. Pyatt & A. Roe (1977) and G. Pyatt & J. Round (1985), which represents the basis of what has so far been done in this area.

Table 5. SAM in endogenous and exogenous accounts

		EXPENDITURES				TOTAL
		Endogenous	$\Sigma$	Exogenous	$\Sigma$	
RECEIPTS	Endogenous	N	n	X	x	$Y_n$
	Exogenous	L	l	R	r	$Y_x$
	TOTAL	$y_n'$		$y_x'$		

Where:

$N$  = matrix of transactions between endogenous accounts  
 $n$  = vector of the row sum of  $N$

$X$  = matrix of the transactions between exogenous and endogenous accounts (injections from first into second)  
 $x$  = vector of the row sum of  $X$

$L$  = matrix of the transactions between endogenous and exogenous accounts (leakages from first into second)  
 $l$  = vector of the row sum of  $L$

$R$  = matrix of the transactions between exogenous accounts  
 $r$  = vector of the row sum of  $R$

$y_n$  = vector (column) of the receipts of the endogenous accounts  
 $y_n'$  = " (row) of the expenditures " " " "  
 $\hat{Y}_n$  = matrix (diagonal) of the receipts " " " "  
 ( $\hat{Y}_n^{-1}$ : inverse)

$y_x$  = vector (column) of the receipts of the exogenous accounts  
 $y_x'$  = " (row) of the expenditures " " " "

From Table 5, it can be written that

$$y_n = n + x \tag{1}$$

$$y_x = l + r \tag{2}$$

It can also be seen that, 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)

In other words, the amount that the endogenous accounts receive is equal to the amount that they spend – using the words of Pyatt (1988): “a SAM is a simple and efficient way of representing the fundamental law of economics: for every income there is a corresponding outlay or expenditure.”

The accounting and fixed-price multipliers, which will allow for further analysis, can now be deduced and decomposed.

a) Deduction of accounting multipliers

If Table 5 shows the structure of a SAM for a year  $t$  (1998 in this study) and 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 in 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 (usually non squared) can be defined of the average expenditure propensities of the endogenous accounts in 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

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

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

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, 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 that there is excess capacity, prices remain constant and that production technology and resource endowment are given.

b) Deduction of fixed-price multipliers

If Table 5 shows the structure of a SAM which is the difference between the SAMs for a year  $t$  and a year  $t-1$  (1998 and 1997 in this study) and the entries in the  $N$  matrix are divided by the corresponding column total, a corresponding matrix (squared) can be defined of the marginal expenditure propensities of the endogenous accounts in the endogenous accounts or of the use of resources within those accounts. Calling this matrix  $D_n$ , it can be written that

$$D_n = N * \hat{y}_n^{-1} \quad (13)$$

$$N = D_n * \hat{y}_n \quad (14)$$

Considering equation (1),  $y_n = D_n * y_n + x$  (15)

Therefore,  $y_n = (I - D_n)^{-1} * x = M_{fp} * x$ . (16)

We thus have the equation that gives the total changes in the receipts of the endogenous accounts ( $y_n$ ), by multiplying the changes in injections “ $x$ ” by the matrix of the fixed-price multipliers:

$$M_{fp} = (I - D_n)^{-1}. \quad (17)$$

On the other hand, if the entries in the  $L$  matrix are divided by the corresponding column total, a corresponding matrix (usually non squared) can be defined of the marginal expenditure propensities of the endogenous accounts in the exogenous accounts or of the use of resources from the endogenous accounts within the exogenous accounts. Calling this matrix  $D_l$ , it can be written that

$$D_l = L * \hat{y}_n^{-1} \quad (18)$$

$$L = D_l * \hat{y}_n \quad (19)$$

Considering equation (2),  $y_x = D_l * y_n + r$  (20)

Thus,  $l = D_l * y_n = D_l * (I - D_n)^{-1} * x = D_l * M_{fp} * x$ . (21)

So, with the fixed-price multipliers, the impact of changes in receipts is analysed at the moment (year  $t$ , 1998 in this study), assuming that the structure of expenditures in the economy changed exactly as it did in relation to the previous year ( $t-1$ , 1997 in this study). This type of methodology allows for a comparative static analysis to be made, assuming that there is excess capacity, prices remain constant and that production technology and resource endowment are given.



c) Decomposition of multipliers

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  $A_n$ ), it can be written that

$$A_n = B_n + C_n. \quad (22)$$

Thus, from equation (6):

$$y_n = B_n * y_n + C_n * y_n + x = [I - (I - B_n)^{-1} * C_n]^{-1} * (I - B_n)^{-1} * x^4. \quad (23)$$

$$\text{Therefore: } M_a = [I - (I - B_n)^{-1} * C_n]^{-1} * (I - B_n)^{-1} = M_3 * M_2 * M_1. \quad (24)$$

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>5</sup>.

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

$$M_1 = (I - B_n)^{-1}. \quad (25)$$

- The intergroup or indirect effects matrix, which represents the effects of the exogenous injection within the groups of accounts, after its repercussions have completed a tour through all the groups and returned to the one which it had originally entered, that is, if we consider “t” to be the number of groups of accounts,

$$M_2 = \{I - [(I - B_n)^{-1} * C_n]^t\}^{-1}. \quad (26)$$

- 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, in other words when it moves around the whole system and ends up in one of the other groups, that is, if we consider “t” to be the number of groups of accounts,

$$M_3 = \{I + [(I - B_n)^{-1} * C_n] + [(I - B_n)^{-1} * C_n]^2 + \dots + [(I - B_n)^{-1} * C_n]^{t-1}\} \quad (27)$$

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

$$M_a = I + (M_1 - I) + (M_2 - I) * M_1 + (M_3 - I) * M_2 * M_1. \quad (28)$$

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<sup>4</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>5</sup> For a detailed deduction and explanation of these components, see, for instance, Stone, 1985; Thorbecke, 1985; Pyatt & Round, 1985; Santos, 1999.

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

A similar analysis could be undertaken with the  $D_n$  matrix.

#### **4.2. Evaluation with changes in government subsector receipts**

The main aim of the present paper is to study the effects of changes in government receipts (injections), which led both the “current” and the “capital” accounts of “central and local government and social security funds”, as well as the “errors and omissions” accounts, to be considered endogenous, beyond the “production” accounts. As a result of this, the other accounts of the institutions and the rest of the world were considered as exogenous (in Outline 1 the numbers of the exogenous accounts are shown in *italics*).

Following the methodology described above, the Portuguese SAM was grouped by endogenous and exogenous accounts, as shown in Table 6.

Table 6. Generic Portuguese SAM grouped by endogenous and exogenous accounts

Outlays (expenditures)			ENDOGENOUS					EXOGENOUS			TOTAL		
			Production			Institutions		Errors and Omiss.	Institutions			Rest of the World	
			Factors	Activ.	Products	Current A.	Capital A.		Current A.	Capital A.			
Incomes (receipts)			1 e 2	3,4,5	6,7,8	11,12,13	17,18,19	22	9,10,14	15,16,20	21		
ENDOGENOUS	Production	Factors	1 e 2	0	AV	0	0	0	0	0	0	CF←rw	CF
		Activities	3,4,5	0	0	P	0	0	0	0	0	0	P
		Products	6,7,8	0	IC	0	FC	GCF	0	FC	GCF	EX	D
	Institutions	Current Account	11,12,13	NP	nta	ntp	CT	0	0	CT	0	CT←rw	Inc
		Capital Account	17,18,19	0	0	0	DS	KT	nL/B	0	KT	KT←rw	IF
	Errors and Omissions	22	0	0	cm	0	0	0	0	0	0	nL/B	nL/B
EXOGENOUS	Institutions	Current Account	9,10,14	NP	0	0	CT	0	0	CT	0	CT←rw	Inc
		Capital Account	15,16,20	0	0	0	0	KT	nL/B	DS	KT	KT←rw	I
	Rest of the World	21	CF→rw	nta→rw	IM	CT→rw	KT→rw	0	CT→rw	KT→rw		TV→rw	
TOTAL			CF	TC	S	Inc	I	nL/B	Inc	I	TV←rw		

Note: See Table 1 for the meaning of the sub-matrices

Firstly, accounting multipliers were calculated from the Portuguese SAM for 1998, whilst the changes that really occurred from 1998 to 1999 were also considered, i.e. the “x” vector of the Portuguese SAM for 1999, 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 1998, the endogenous part of the SAM was re-calculated for 1999, where the aggregate values have the percentage differences in relation to the real SAM values that are shown in Table 7.

Table 7. Aggregate percentage differences between the values of the Portuguese SAM for 1999 and the SAM values estimated from the accounting multipliers for 1998 and the “x” vector for 1999.

Outlays (expenditures)		ENDOGENOUS						EXOGENOUS			TOTAL	
		Production			Institutions		Errors and Omiss.	Institutions		Rest of the World		
		Factors	Activ.	Products	Current A.	Capital A.		Current A.	Capital A.			
Incomes (receipts)		1 e 2	3,4,5	6,7,8	11,12,13	17,18,19	22	9,10,14	15,16,20	21		
ENDOGENOUS	Production	Factors	0	+1.59% (AV)	0	0	0	0	0	0	CF←rw	+1.52% (CF)
		Activities	0	0	+2.31% (P)	0	0	0	0	0	0	+2.31% (P)
		Products	0	+2.73% (IC)	0	-0.11% (FC)	+11.44% (GCF)	0	FC	GCF	EX	+1.36% (D)
	Institutions	Current Account	+0.09% (NP)	-21.69% (nta)	-43.42% (ntp)	-1.96% (CT)	0	0	TC	0	CT←rw	-0.80% (Inc)
		Capital Account	0	0	0	-2.63% (DS)	+26.65% (KT)	+41.37% (nL/B)	0	KT	KT←rw	+22.0% (IF)
	Errors and Omissions	22	0	0	0% (cm)	0	0	0	0	0	NL/B	-6.06% (nL/B)
EXOGENOUS	Institutions	Current Account	+1.47% (NP)	0	0	-21.44% (CT)	0	0				
		Capital Account	0	0	0	0	+34.63% (KT)	-48.42% (nL/B)				
	Rest of the World	21	+4.28% (CF→rw)	-6.87% (nta→rw)	-0.99% (IM)	-7.37% (CT→rw)	+137.8% (KT→rw)	0				
TOTAL			+1.52% (CF)	+2.31% (TC)	+1.36% (S)	-0.80% (Inc)	+22.04% (I)	-6.06% (nL/B)				

▨ = X matrix

Source: Portuguese SAM for 1999 (real and estimated from accounting multipliers for 1998)

From this table, it can be seen that, with some exceptions (almost all related with values that have little influence on the total), the differences between the estimated and the real values are not significant.

Therefore the calculated accounting multipliers can be used, with a reasonable level of veracity, to analyse the effects of exogenous changes in the receipts of the government's (the only endogenous institution in the defined model) current and capital accounts, assuming that the expenditure structure does not change.

Secondly, fixed-price multipliers were calculated from the differences between the Portuguese SAMs for 1998 and 1997, whilst the changes that really occurred from 1998 to 1999 were also considered, i.e. the “x” vector of the differences between the

Portuguese SAMs for 1998 and 1999, and the new vector of changes in the receipts of the endogenous accounts ( $y_n$ ) was calculated. From this, and with the aid of the matrices of marginal expenditure propensities ( $D_n$  and  $D_i$ ) for 1998-1997, the changes in the endogenous part of the SAM was re-calculated for 1999 in relation to 1998, which, when added to the SAM values in 1998, have the percentage differences in relation to the real SAM values (in 1999) that are shown in Table 8.

Table 8. Aggregate percentage differences between the values of the Portuguese SAM for 1999 and the SAM values estimated from the fixed-price multipliers for 1998-1997 and the “x” vector for 1999-1998.

Outlays (expenditures)			ENDOGENOUS					EXOGENOUS			TOTAL	
			Production			Institutions		Errors and Omiss.	Institutions			Rest of the World
			Factors	Activ.	Products	Current A.	Capital A.		Current A.	Capital A.		
Incomes (receipts)			1 e 2	3,4,5	6,7,8	11,12,13	17,18,19	22	9,10,14	15,16,20	21	
ENDOGENOUS	Production	Factors	0	+0.15% (AV)	0	0	0	0	0	0	CF←rw	-0.14% (CF)
		Activities	0	0	+0.22% (P)	0	0	0	0	0	0	+0.22% (P)
		Products	0	+0.44% (IC)	0	-3.93% (FC)	+12.25% (GCF)	0	FC	GCF	EX	-0.15% (D)
	Institutions	Current Account	+3.85% (NP)	-45.80% (nta)	-6.33% (ntp)	-2.00% (CT)	0	0	TC	0	CT←rw	+1.13% (Inc)
		Capital Account	0	0	0	59.12% (DS)	+65.14% (KT)	-1.14% (nL/B)	0	KT	KT←rw	+31.67% (IF)
	Errors and Omissions	22	0	0	0% (cm)	0	0	0	0	0	NL/B	-1.80% (nL/B)
EXOGENOUS	Institutions	Current Account	+0.91% (NP)	0	0	-20.52% (CT)	0	0				
		Capital Account	0	0	0	0	+46.01% (KT)	-2.39% (nL/B)				
	Rest of the World	21	+5.95% (CF→rw)	-441% (nta→rw)	-1.99% (IM)	3.98% (CT→rw)	+824% (KT→rw)	0				
TOTAL			-0.14% (CF)	+0.22% (TC)	+0.15% (S)	1.13% (Inc)	+31.67% (I)	-1.80% (nL/B)				

▨ = X matrix

Source: Portuguese SAM for 1999 (real and estimated from fixed-price multipliers for 1998-1997)

From this table, it can be seen that, with some exceptions, the differences between the estimated and the real values are not significant, and in some cases they are even less significant than those seen above for the accounting multipliers.

Therefore, as in the case of accounting multipliers, the calculated fixed-price multipliers can be used, with a reasonable level of veracity, to analyse the effects of exogenous changes in the receipts of the government accounts (current and capital), assuming that the expenditure structure changes exactly as it had changed in relation to the former year.

As the percentage differences associated with the government accounts are greater with fixed-price multipliers than with accounting multiplier, this study will continue with the analysis of the accounting multipliers.

In keeping with what was seen before, the items that can be changed in the current receipts of the three government subsectors (the items in rows 11, 12 and 13 of the X matrix, presented in Table 6 – see the cell contents shown in the annex) are:

- current taxes on income, wealth, etc., employees' social contributions and social contributions by self-employed and non-employed persons paid by households, enterprises and other institutions;
- non-life insurance claims paid by other institutions (financial corporations);
- miscellaneous current transfers from households, enterprises, other institutions and the rest of the world;
- current international cooperation from the rest of the world.

According to the average expenditure propensities, the changes to be noted in the way a unit of current receipts is spent by government subsectors are shown in the following table.

Table 9. How government subsectors spend a unit of their current receipts

	Central Government (account 11)	Local Government (account 12)	Social Security Funds (SSF) (account 13)
Final consumption	0.194	0.531	0.022
Current transfers	0.783	0.360	0.915
- to Central Gov.	0.217	0.073	0.034
- to Local Gov.	0.046	0.016	0.007
- to SSF	0.063	0.021	0.010
- to households, enterprises and other institutions	0.457	0.250	0.864
Current transfers to the rest of the world	0.023	0	0.003
Saving	0	0.109	0.059

Source:  $A_n$  and  $A_l$  matrices (calculated from the Portuguese SAM for 1998)

Thus, except in the case of local government, most of the government's current receipts go to current transfers, a significant part of which goes to households, enterprises and other institutions (exogenous). On the other hand, local government spends more than half of its current receipts on final consumption.

As can be seen in Table 10, the multipliers and their components, show the repercussions of these changes on the economy.

From an analysis of this table, it can be concluded that aggregate government income is the item in which the effect of a unitary change in exogenous current receipts is most felt, thus reflecting the importance of current transfers, shown by the average expenditure propensities (Table 9), and the fact that the exogenous injections are items included amongst current transfers. The additional intragroup effects only exist in aggregate government income and are very important, especially for central government. In general, the additional extragroup effects are the most important effects in the other items, which means that a significant proportion of the repercussions of the changes in exogenous government current receipts do not return to the group of accounts in which they were originally felt. On the other hand, the effects on production value and aggregate demand of a unitary change in the exogenous current receipts of local government reveal the importance of final consumption in this subsector's expenditure structure.

There is no doubt that social security funds are the least important of the three government subsectors, in terms of the impact on the economy of a change in this subsector's exogenous current receipts.

The values of government investment funds, which are negative in the case of central and local government, are believed to be related to the share of savings in total expenditure as well as its values (in 1998, 2 million euros for central government and 467 million euros for local government, in a total of 20,804 million euros – see Table 3). One should also take into account the relatively low level of veracity of these values, as expressed by the relatively high (+ 22%) value shown in the last column of Table 7.

Finally, the last row of Table 10 shows that a unitary change in the exogenous current receipts of the three government subsectors results in a change with an opposite mathematical sign in the net borrowing of the Portuguese economy. This means, for instance, that any increases in this item will result in decreases in the economy's financing requirements, with this tendency mainly being due to additional extragroup effects.



Table 10. Effects of unitary changes in the exogenous current receipts of government subsectors on the Portuguese economy in 1998

Level where the effect is felt	Central Government				Local Government				Social Security Funds			
	M <sub>a</sub>	Additional effects			M <sub>a</sub>	Additional effects			M <sub>a</sub>	Additional effects		
		intragroup	intergroup	extragroup		intragroup	intergroup	extragroup		intragroup	intergroup	extragroup
Aggregate factor income	0.273	0	- 0.004	0.276	0.597	0	0.003	0.595	0.052	0	0.004	0.048
Production value/total costs	0.518	0	0.064	0.455	1.150	0	0.132	1.018	0.110	0	0.010	0.101
Aggregate demand/supply	0.523	0	- 0.012	0.535	1.188	0	-0.010	1.199	0.134	0	0.005	0.129
Aggregate government income	1.488	0.431	0.012	0.045	1.274	0.145	0.024	0.105	1.082	0.068	0.002	0.013
- Central Government	1.313	0.287	0.004	0.022	0.156	0.096	0.009	0.051	0.053	0.045	0.001	0.007
- Local Government	0.068	0.061	0.001	0.006	1.036	0.020	0.003	0.013	0.011	0.010	0	0.002
- Social Security Funds	0.107	0.083	0.006	0.018	0.081	0.028	0.013	0.040	1.018	0.013	0.001	0.004
Government investment funds	- 0.051	0	-0.003	-0.048	-0.015	0	-0.003	-0.012	0.137	0	0.001	0.136
- Central Government	- 0.057	0	-0.002	-0.055	-0.123	0	-0.003	-0.120	0.059	0	0.001	0.059
- Local Government	- 0.002	0	0	-0.001	0.100	0	0	0.100	0.018	0	0	0.018
- Social Security Funds	0.008	0	0	0.008	0.008	0	0	0.008	0.060	0	0	0.060
Net borrowing of the economy	- 0.065	0	- 0.002	- 0.062	- 0.131	0	- 0.005	- 0.126	- 0.003	0	0	- 0.003

Source: Portuguese accounting multiplier matrix (M<sub>a</sub>) for 1998 and its components (additional intragroup effects (M<sub>1</sub>-I), additional intergroup effects ((M<sub>2</sub>-I)\*M<sub>1</sub>) and additional extragroup effects ((M<sub>3</sub>-I)\*M<sub>2</sub>\*M<sub>1</sub>)).

On the other hand, changes can also be made in the following government capital receipts (the items in rows 17, 18 and 19 of the X matrix, presented in Table 6 – see the cell contents in the annex):

- capital taxes paid by households, enterprises and other institutions;
- other capital transfers from households, enterprises, other institutions and the rest of the world;
- investment grants received from the rest of the world.

According to the average expenditure propensities, Table 11 shows the changes in the way a unit of capital receipts is spent by government subsectors.

Table 11. How government subsectors spend a unit of their capital receipts

	Central Government (account 17)	Local Government (account 18)	Social Security Funds (SSF) (account 19)
Gross capital form.	0.287	0.836	0.069
Capital transfers	0.697	0.162	0.931
- to Central Gov.	0.180	0.005	0.848
- to Local Gov.	0.257	0.069	0.000
- to SSF	0.004	0.000	0.000
- to households, enterprises and other institutions	0.256	0.088	0.083
Capital transfers to the rest of the word	0.015	0.002	0.000

Source:  $A_n$  and  $A_l$  matrices (calculated from the Portuguese SAM for 1998)

Therefore, except in the case of local government, most of a unit of capital receipts goes to capital transfers, a significant part of which is transferred to government subsectors. In its turn, local government spends most of its capital receipts on gross capital formation.

The calculated accounting multipliers and their components, from which Table 12 was constructed, show the effects on the Portuguese economy of unitary changes in the exogenous capital receipts of government subsectors.

Table 12. Effects of unitary changes in the exogenous capital receipts of government subsectors on the Portuguese economy in 1998

Level where the effect is felt	Central Government				Local Government				Social Security Funds			
	M <sub>a</sub>	Additional effects			M <sub>a</sub>	Additional effects			M <sub>a</sub>	Additional effects		
		intragroup	intergroup	extragroup		intragroup	intergroup	extragroup		intragroup	intergroup	extragroup
Aggregate factor income	0.278	0	0.008	0.270	0.395	0	0.012	0.383	0.266	0	0.008	0.258
Production value/total costs	0.753	0	0.091	0.662	1.068	0	0.129	0.938	0.720	0	0.087	0.633
Aggregate demand/supply	1.184	0	0.025	1.195	1.679	0	0.036	1.644	1.133	0	0.024	1.109
Aggregate government income	0.124	0	0.016	0.109	0.176	0	0.022	0.154	0.119	0	0.015	0.104
- Central Government	0.082	0	0.007	0.075	0.117	0	0.010	0.106	0.079	0	0.007	0.072
- Local Government	0.014	0	0.002	0.012	0.019	0	0.003	0.017	0.013	0	0.002	0.011
- Social Security Funds	0.028	0	0.007	0.022	0.040	0	0.010	0.031	0.027	0	0.007	0.021
Government investment funds	1.697	0.570	0.005	0.122	1.262	0.082	0.007	0.173	2.452	1.331	0.005	0.116
- Central Government	1.333	0.227	0.004	0.103	0.158	0.006	0.001	0.145	1.142	1.040	0.004	0.098
- Local Government	0.359	0.338	0.001	0.020	1.105	0.076	0.001	0.028	0.307	0.287	0.001	0.019
- Social Security Funds	0.004	0.005	0	-0.001	-0.001	0	0	-0.001	1.003	0.004	0	-0.001
Net borrowing of the economy	0.106	0	0.004	0.102	0.151	0	0.006	0.145	0.102	0	0.004	0.098

Source: Portuguese accounting multiplier matrix (M<sub>a</sub>) for 1998 and its components (additional intragroup effects (M<sub>1</sub>-I), additional intergroup effects ((M<sub>2</sub>-I)\*M<sub>1</sub>) and additional extragroup effects ((M<sub>3</sub>-I)\*M<sub>2</sub>\*M<sub>1</sub>)).

As far as the veracity of the data that are being treated here is concerned (see last column of Table 7), it can be seen that government investment funds are now the most affected, except in the case of local government, whose unitary changes in exogenous capital receipts most affect aggregate demand, certainly due to the high average expenditure propensity associated with gross capital formation. Additional intragroup effects are also of great importance here, especially for central government, in the effects on government investment funds, an item that represents the group of accounts where the change is originally felt. In the case of other items, additional extragroup effects are, once again, sufficient to show that a significant part of the repercussions of changes in government capital receipts do not return to the group of accounts where they were originally felt.

There are no significant differences between the three government subsectors in terms of the impact on the economy of a change in their capital receipts, although mention should be made of the greater importance of the effects of changes in the capital receipts of social security funds on the central government's investment funds. There are also significant effects to be noted on the aggregate demand of the central government and social security funds.

The values of the effect on the net borrowing of the economy are very similar and have the same mathematical sign as the initial change. This means, for instance, that increases in the exogenous capital receipts of government subsectors will result in increases in net borrowing or in the economy's financing requirements. As was seen in the case of current receipts, this tendency is due mainly to additional extragroup effects.

#### **4. Summary and conclusions**

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.

With a reasonable level of veracity, as measured in Table 7, it was possible to see how three Portuguese government subsectors spent their receipts in 1998. Thus, most of the:

- current receipts were spent on current transfers, mainly to households and other institutions, in the case of central government and social security funds, or on final consumption, in the case of local government;
- capital receipts were spent on capital transfers between government subsectors, in the case of central government and social security funds, and on gross capital formation, in the case of local government;

Experiments conducted with government receipts included the corresponding expenditure, the structure of which (given by the average propensities) is assumed to be unchangeable. From Tables 7 and 8, it can be concluded that the experiments using accounting multipliers produced results that were relatively closer to reality, in respect of government receipts and expenditures, than those using fixed-price multipliers.

Accounting multipliers and their components made it possible to quantify the impact of changes on government receipts on the economy as a whole.

On the one hand, it was possible to see the repercussions of these changes, in aggregate terms, at the level of both production and institutions. The following main conclusions could be drawn:

- aggregate government income was the item most affected by changes in its current receipts, with the extent of the impact consisting mainly of additional intragroup effects, besides the initial change, whose mathematical sign was the same.
- aggregate demand/supply and production value/total costs were also significantly influenced by changes in the government's current receipts, with the extent of the impact consisting only or mainly of additional extragroup effects that had the same mathematical sign as the initial change.
- government investment funds were almost always the item most affected by changes in the government's capital receipts, with the extent of the impact consisting mainly of additional intragroup effects, besides the initial change, whose mathematical sign was the same.
- changes in the government's capital receipts also had significant impacts at the production level, but in very different ways from subsector to subsector, although the extent of the impact almost always consisted only or mainly of additional extragroup effects that had the same mathematical sign as the initial change.

- injections of funds into government accounts generate important additional intragroup or direct effects on the group of accounts in which they are first felt, as well as important extragroup effects on other groups of accounts, meaning that most of the repercussions going out from that group of accounts do not return to it, so that the intergroup effects are consequently extremely reduced.

The SAM-based study that was carried out has made it possible to describe the structural features of the Portuguese economy from 1997 to 1999 with an emphasis on general government. Through its modelling with the use of accounting (and fixed-price) 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 on the economy as a whole .

Despite its limiting assumptions, such as linear relationships and fixed coefficients, 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 (see Tables 6 and 7), many others, involving other years, could be undertaken to confirm the usefulness of SAM. Other studies could also be undertaken changing the position of the dividing line between endogenous and exogenous accounts (to use the words of Stone, 1981).

The SAM is therefore a working instrument providing a database that can be specially adapted for specific economic analysis, as well as for decision-making purposes. Its improvement and institutionalisation represent an important challenge.

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## ANNEX

### Description of the SAM cell contents

Row	Col.	Contents
1	3	Compensation of employees paid by primary sector activities
1	4	Compensation of employees paid by secondary sector activities
1	5	Compensation of employees paid by tertiary sector activities
1	21	Compensation of employees paid by the rest of the world (from non-resident employers)
2	3	Gross operating surplus of primary sector activities
2	4	Gross operating surplus of secondary sector activities
2	5	Gross operating surplus of tertiary sector activities
2	21	Property income paid by the rest of the world
3	6	Output of primary sector products through the activities of the same sector
3	7	Output of secondary sector products through the activities of the primary sector
3	8	Output of tertiary sector products through the activities of the primary sector
4	7	Output of secondary sector products through the activities of the same sector
4	8	Output of tertiary sector products through the activities of the secondary sector
5	6	Output of primary sector products through the activities of the tertiary sector
5	7	Output of secondary sector products through the activities of the tertiary sector
5	8	Output of tertiary sector products through the activities of the same sector
6	3	Intermediate consumption of primary sector products through the activities of the same sector
6	4	Intermediate consumption of primary sector products through secondary sector activities
6	5	Intermediate consumption of primary sector products through tertiary sector activities
6	9	Household actual final consumption of primary sector products
6	15	Gross Capital Formation on primary sector products by the enterprises classified in the households institutional sector
6	16	Gross Capital Formation on primary sector products by non-financial corporations
6	21	Exports of primary sector products
7	3	Intermediate consumption of secondary sector products through primary sector activities
7	4	Intermediate consumption of secondary sector products through the activities of the same sector
7	5	Intermediate consumption of secondary sector products through tertiary sector activities
7	9	Households actual final consumption of secondary sector products

Row	Col.	Contents
7	11	Central government actual final consumption of secondary sector products
7	12	Local government actual final consumption of secondary sector products
7	13	Social security funds actual final consumption of secondary sector products
7	15	Gross Capital Formation on secondary sector products by the enterprises classified in the households institutional sector
7	16	Gross Capital Formation on secondary sector products by the non-financial corporations
7	17	Gross Capital Formation on secondary sector products by the central government
7	18	Gross Capital Formation on secondary sector products by the local government
7	19	Gross Capital Formation on secondary sector products by the social security funds
7	20	Gross Capital Formation on secondary sector products by the financial corporations and non-profit institutions serving households
7	21	Exports of secondary sector products
8	3	Intermediate consumption of tertiary sector products by primary sector activities
8	4	Intermediate consumption of tertiary sector products by secondary sector activities
8	5	Intermediate consumption of tertiary sector products by the activities of the same sector
8	9	Households actual final consumption of tertiary sector products
8	11	Central government actual final consumption of tertiary sector products
8	12	Local government actual final consumption of tertiary sector products
8	13	Social security funds actual final consumption of tertiary sector products
8	15	Gross Capital Formation on tertiary sector products by the enterprises classified in households institutional sector
8	16	Gross Capital Formation on tertiary sector products by non-financial corporations
8	17	Gross Capital Formation on tertiary sector products by central government
8	18	Gross Capital Formation on tertiary sector products by local government
8	19	Gross Capital Formation on tertiary sector products by social security funds
8	20	Gross Capital Formation on tertiary sector products by financial corporations and non-profit institutions serving households
8	21	Exports of tertiary sector products (includes direct purchases in domestic market by non-residents and the c.i.f./f.o.b. adjustment)
9	1	Wages and salaries plus imputed social contributions received by households
9	2	Gross mixed income plus net property income received by households
9	9	Social benefits other than social transfers in kind and miscellaneous current transfers within households
9	10	Social benefits other than social transfers in kind and miscellaneous current transfers from non-financial corporations to households
9	11	Social benefits other than social transfers in kind, social transfers in kind and miscellaneous current transfers from central government to households

Row	Col.	Contents
9	12	Social benefits other than social transfers in kind, social transfers in kind and miscellaneous current transfers from local government to households
9	13	Social benefits other than social transfers in kind and social transfers in kind paid from social security funds to households
9	14	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
9	21	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
10	1	Imputed social contributions received by non-financial corporations
10	2	Gross operating surplus plus net property income received by non-financial corporations
10	10	Miscellaneous current transfers within non-financial corporations
10	11	Miscellaneous current transfers from central government to non-financial corporations
10	12	Miscellaneous current transfers from local government to non-financial corporations
10	14	Non-life insurance claims and miscellaneous current transfers from financial corporations to non-financial corporations
10	21	Non-life insurance claims received by non-financial corporations from the rest of the world
11	1	Imputed social contributions received by central government
11	2	Gross operating surplus plus net property income received by central government
11	3	Other taxes on production paid by primary sector activities minus other subsidies on production received by the same activities from central government
11	4	Other taxes on production paid by secondary sector activities minus other subsidies on production received by the same activities from central government
11	5	Other taxes on production paid by tertiary sector activities minus other subsidies on production received by the same activities from central government
11	6	Taxes on primary sector received by the central government minus subsidies on those products from central government
11	7	Taxes on secondary sector received by central government minus subsidies on those products from the central government
11	8	Taxes on tertiary sector received by central government minus subsidies on those products from central government
11	9	Current taxes on income, wealth, etc., employees' social contributions, social contributions by self-employed and non-employed persons and miscellaneous current transfers received by central government from households
11	10	Current taxes on income, wealth, etc., and miscellaneous current transfers

Row	Col.	Contents
		received by central government from non-financial corporations
11	11	Current transfers and miscellaneous current transfers within central government
11	12	Current transfers and miscellaneous current transfers from local government to central government
11	13	Current transfers and miscellaneous current transfers from social security funds to central government
11	14	Current taxes on income, wealth, etc. paid by financial corporations and non-profit institutions serving households to central government; non-life insurance claims paid by financial corporations to central government; miscellaneous current transfers from financial corporations and non-profit institutions serving households to central government
11	21	Current international cooperation and miscellaneous current transfers received by central government from the rest of the world
12	1	Imputed social contributions received by local government
12	2	Gross operating surplus plus net property income received by local government
12	3	Other taxes on production paid by primary sector activities minus other subsidies on production received by the same activities from local government
12	4	Other taxes on production paid by secondary sector activities minus other subsidies on production received by the same activities from local government
12	5	Other taxes on production paid by tertiary sector activities minus other subsidies on production received by the same activities from local government
12	6	Taxes on primary sector received by the local government minus subsidies on those products from the local government
12	7	Taxes on secondary sector received by local government minus subsidies on those products from local government
12	8	Taxes on tertiary sector received by the local government minus subsidies on those products from the local government
12	9	Current taxes on income, wealth, etc., employees' social contributions, social contributions by self-employed and non-employed persons and miscellaneous current transfers received by the local government from households
12	10	Current taxes on income, wealth, etc., and miscellaneous current transfers received by local government from non-financial corporations
12	11	Current transfers from central government to local government
12	12	Current transfers within local government
12	13	Current transfers from social security funds to local government
12	14	Current taxes on income, wealth, etc. paid by financial corporations and non-profit institutions serving households to local government; non-life insurance claims paid by financial corporations to local government; miscellaneous current transfers from financial corporations and non-profit institutions serving households to local government
12	21	Current international cooperation and miscellaneous current transfers received by local government from the rest of the world

Row	Col.	Contents
13	1	Imputed social contributions plus employers' actual social contributions received by social security funds
13	2	Gross operating surplus plus net property income received by social security funds
13	3	Other taxes on production paid by primary sector activities minus other subsidies on production received by the same activities from social security funds
13	4	Other taxes on production paid by secondary sector activities minus other subsidies on production received by the same activities from social security funds
13	5	Other taxes on production paid by tertiary sector activities minus other subsidies on production received by the same activities from social security funds
13	6	Taxes on primary sector products received by social security funds
13	7	Taxes on secondary sector products received by social security funds
13	8	Taxes on tertiary sector products received by social security funds
13	9	Employees' social contributions, social contributions by self-employed and non-employed persons and miscellaneous current transfers received by social security funds from households
13	10	Miscellaneous current transfers from non-financial corporations to social security funds
13	11	Current transfers from central government to social security funds
13	21	Current international cooperation received by social security funds from the rest of the world
14	1	Imputed social contributions received by financial corporations and non-profit institutions serving households
14	2	Gross operating surplus plus net property income received by financial corporations and non-profit institutions serving households
14	9	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
14	10	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
14	11	Net non-life insurance premiums received by financial corporations from central government; miscellaneous current transfers from central government to non-profit institutions serving households
14	12	Net non-life insurance premiums received by financial corporations from local government; miscellaneous current transfers from local government to non-profit institutions serving households
14	13	Miscellaneous current transfers from social security funds to non-profit institutions serving households
14	14	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

Row	Col.	Contents
		financial corporations to non-profit institutions serving households and within the latter
14	21	Net non-life insurance premiums and non-life insurance claims received by financial corporations from the rest of the world
15	9	Gross savings of households
15	17	Investment grants from central government to households
15	18	Investment grants and other capital transfers from local government to households
15	20	Other capital transfers from financial corporations to households
15	21	Investment grants and other capital transfers from the rest of the world to households
15	22	Net lending of households
16	10	Gross savings of non-financial corporations
16	17	Investment grants and other capital transfers from central government to non-financial corporations
16	18	Investment grants and other capital transfers from local government to non-financial corporations
16	19	Other capital transfers from social security funds to non-financial corporations
16	21	Investment grants and other capital transfers from the rest of the world to non-financial corporations
16	22	Net borrowing of non-financial corporations
17	11	Gross savings of central government
17	15	Capital taxes and other capital transfers received by central government from households
17	16	Other capital transfers from non-financial corporations to central government
17	17	Investment grants within central government
17	18	Investment grants from local government to central government
17	19	Investment grants and other capital transfers from social security funds to central government
17	20	Other capital transfers from financial corporations and non-profit institutions serving households to central government
17	21	Investment grants and other capital transfers from the rest of the world to central government
17	22	Net borrowing of central government
18	12	Gross savings of local government
18	15	Capital taxes and other capital transfers received by local government from households
18	16	Other capital transfers from non-financial corporations to local government
18	17	Investment grants and other capital transfers from central government to local government
18	18	Investment grants within local government
18	20	Other capital transfers from financial corporations and non-profit institutions serving households to local government
18	21	Investment grants and other capital transfers from the rest of the world to local government
18	22	Net lending of local government

Row	Col.	Contents
19	13	Gross savings of social security funds
19	16	Other capital transfers from non-financial corporations to social security funds
19	17	Investment grants from central government to social security funds
19	21	Investment grants and other capital transfers from the rest of the world to social security funds
19	22	Net lending of social security funds
20	14	Gross savings of financial corporations and non-profit institutions serving households
20	17	Investment grants from central government to non-profit institutions serving households
20	18	Investment grants and other capital transfers from local government to non-profit institutions serving households
20	19	Investment grants from social security funds to non-profit institutions serving households
20	20	Other capital transfers within financial corporations
20	21	Investment grants from the rest of the world to non-profit institutions serving households
20	22	Net lending of financial corporations and non-profit institutions serving households
21	1	Compensation of employees received by the rest of the world (paid to non-resident employees)
21	2	Property income received by the rest of the world
21	3	Minus other subsidies on production received by primary sector activities from the institutions and other countries of the European Union
21	4	Minus other subsidies on production received by secondary sector activities from the institutions and other countries of the European Union
21	5	Minus other subsidies on production received by tertiary sector activities from the institutions and the other countries of the European Union
21	6	Imports of primary sector products plus the part of taxes on those products received by the institutions of the European Union minus the part of the subsidies for those products received from the same institutions
21	7	Imports of secondary sector products plus the part of taxes on those products received by the institutions of the European Union minus the part of the subsidies for those products received from the same institutions
21	8	Imports of tertiary sector products plus the part of taxes on those products received by the institutions of the European Union minus the part of the subsidies for those products received from the same institutions
21	9	Net non-life insurance premiums and miscellaneous current transfers received by the rest of the world from households; direct purchases abroad by residents
21	10	Net non-life insurance premiums received by the rest of the world from non-financial corporations
21	11	Net non-life insurance premiums, current international cooperation and miscellaneous current transfers received by the rest of the world from central government
21	13	Social benefits other than social transfers in kind received by the rest of the world from social security funds



Row	Col.	Contents
21	14	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
21	15	Acquisitions minus disposals of non-produced non-financial assets and other capital transfers from households to the rest of the world
21	16	Acquisitions minus disposals of non-produced non-financial assets and other capital transfers from non-financial corporations to the rest of the world
21	17	Acquisitions minus disposals of non-produced non-financial assets, investment grants and other capital transfers from central government to the rest of the world
21	18	Acquisitions minus disposals of non-produced non-financial assets from local government to the rest of the world
21	19	Acquisitions minus disposals of non-produced non-financial assets from social security funds to the rest of the world
21	20	Acquisitions minus disposals of non-produced non-financial assets from financial corporations to the rest of the world
22	6	Trade margins of primary sector products
22	7	Trade margins of secondary sector products
22	8	Trade margins of tertiary sector products
22	21	Net lending of the rest of the world /Net borrowing of the Portuguese economy