Türkish Social Accounting Matrix for 1996

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Abstract: This study is aimed at constructing detail social accounting matrix (SAM) for Turkey by using the most recent available data. In order to reconcile the inconsistency in data which are gathered from various official institutions, the study employs Cross Entropy method.

Key words: Social Accounting Matrix (SAM), Balancing SAM, Cross Entropy method, Data for CGE model.

1996 için Türk Sosyal Hesaplar Matrisi

Özet: Bu çalışmanın amacı mevcut dataları kullanarak Turkiye için bir Sosyal Hesaplar Matrisi hesaplamaktır. Mevcut datalar farklı kurumlar tarafından yayınlanmasından dolayı gözlenen uyumsuzlukları ortadan kaldırmak için Cross Entropy methodu kullanılmıştır.

Anahtar Kelimeler: Sosyal Hesaplar Matrisi (SHM), SHM uyumlaştırma metodları, Cross Entropy metodu, Hesaplanabilir denge modeli icin data.

1. INTRODUCTION

The main objective of the SAM is to elegantly show various interdependencies in a socioeconomic system as a whole by recording, as comprehensively as practicable, the actual and imputed transactions and transfers between various agents in the system (Round, 2003, p. 3). The input-output tables and national accounting statistics by their own rights are very useful in a variety of economic models. However, one of the tools that economic scientists can use to establish a real link between economic and social development for a given country should include disaggregated data showing an association between the real quantities (e.g., income, imports, exports) and microeconomic entities for a given country (Thorbecke, 2002, p.5).

In the construction process, several problems arise in estimating the SAM. Although it is very likely for researchers to find statistically coherent macroeconomic data (e.g., national accounting data that are published annually; supplementary data in public finance, such as tax rates for various institutions and indirect tax rates for domestic and imported commodities), data in disaggregated sectors (e.g., employment, input-output structure), data in the subcategory of goods and services that are subject to international trade, and

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data in each type of household's demand over the commodity vector are all published with time lag and are based on different units (e.g., exchange rate, price indices).

When the collected data are inconsistent or there exists missing data for some of the variables, researchers employ so called SAM balancing techniques.

In order to overcome the data problems, we will use the Cross Entropy (CE) method as a SAM balancing technique. Recent studies by Golan, Judge and Robinson (1994) , Golan, Judge and Miller (1996) and Robinson, Cattaneo and El Said (2000) suggest that by using "maximum entropy econometrics"

techniques, researchers might be able to handle "ill-defined" data in constructing a SAM.

The objective of this research is to explain the details about the way we construct a SAM for Turkey. The organization of this chapter is as follows: In the first part, we give a brief survey of SAM literature. In the second part, we describe an aggregate-level SAM also known as macro-SAM. The third section describes the SAM we constructed for the Turkish economy. In the fourth section, we describe the Cross Entropy method, which we used as a device to reconcile the differences in information from various data-generation institutions. Finally, we give comments in our study and explain certain caveats in using the SAM we constructed.

2. WHAT IS SOCAIL ACCOUNTING MATRIX?

A SAM that includes both economic and social dimensions of a given country is a comprehensive, flexible and disaggregated framework that elaborates and articulates the generation of income by activities of production and the distribution and redistribution of income between the social groups (Round, 2003, p. 2).

National-income statistics provide abstract quantities for production, employment, trade and use of resources in these activities. On the other hand, another dimension of social research is to analyze the distribution of the resources in the income-generation process, including government revenues and expenditures over segments of the society. Therefore, the social accounting system can be very beneficial in applied work when issues related to distribution matter in analyzing the possible outcome of policy changes for a given country.

Although the Turkish economy has a long tradition of planning, there have been no official attempts to construct a SAM for Turkey (DeSantis and Ozhan ,1997, p. 284).[1] In general, scholars tended to construct relatively small SAMs according to their modeling needs.[2] There are only a few studies whose main objective is to construct a disaggregated SAM for Turkey.[3]

The SAM is a square matrix involving several transactions that take place in a given period (generally a year) by economic actors for a given country. In basic economic logic, if income exists due to a transaction, then there must be a corresponding expenditure and therefore the basic algorithm of the SAM is based on the Double-Entry Bookkeeping method where each account receives income on its raw account while making payments on its column account.[4] In general, a particular cell in a SAM, $\{t_{i,j}\}$, is defined as an income or the receipts of account *i* from accounts *j*, or inversely, it describes the payments of account *j* to account *i*. That is if *i* is a set describing the members of the set on the row and if *j* is the set that describes the member of the set on the column, then the SAM is $n \times n$ matrix with: $i, j: \quad \{i = 1,...n; j = 1,...n\}$. On the basis of Double-Entry Bookkeeping principles, the total resources (income) will be identical to total payments (expenses) for every account.

$$\sum_{j}^{n} t_{k,j} = \sum_{i}^{n} t_{i,k}$$

3. MACRO SAM FOR TURKISH ECONOMY FOR 1996

In order to build disaggregated SAM, the first step is building a macro SAM. The SAM with a highly aggregated format is defined as macro SAM. Basically, each cell in the macro SAM gives the sum of submatrices in the disaggregated SAM. Because the disaggregated data come from various sources with different

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[1] Main data-producing institutions are State Institute of Statistics (SIS, henceforth), State Planning Organization (SPO, henceforth), the Treasury and the Central Bank of the Republic of Turkey (CBRT, henceforth).

[2] For example, Dervis et al. (1982), Celasun (1986), Lewis and Urata (1988), Yeldan (1988), Tunc (1997), and Harrison et al. (1996).

[3] See Kose and Yeldan (1996). These studies are Senesen (1984), Ozhan (1989), and DeSantis and Ozhan (1996).

[4] Traditionally, the receipts (revenue or income) of an account appear along its row and its expenses (payments) along its columns [Reinert and Roland-Holst (1997)].

dates of publication and with different valuation, the macro SAM draws the limit to which the totals of submatrices must be equal.

The macro SAM constructed for Turkey is displayed in table 1. We use four data sources in order to build the macro SAM: an input-output table, national-income statistics, balance-of-payments statistics and government statistics.[5] The macro SAM (SAM_{ij}) consists of nine accounts (i.e., $i=1, \ldots 9$).

The activity account ($SAM_{i,1}$) shows the payments for intermediate input ($SAM_{2,1}$), payments to labor ($SAM_{3,1}$), payments to capital and land ($SAM_{4,1}$), and net indirect tax payments ($SAM_{7,1}$) to government in the production process.[6] The sum of the overall-activity account will give the total value of production, while the sum of the third and fourth rows gives the net value added.

In the original input-output table, the depreciation allowances are subtracted from the operating surplus.

In the activity account, the government service production is assumed to equal to its wage payments. The depreciation allowances for the government activity account are added to the government wage bill.[7]

In order to calculate indirect taxes over the domestically produced commodities, we used both the input-output table and fiscal and financial statistics (SIS, 2002b). After subtracting the indirect taxes paid by the firms from the total indirect tax revenue (excluding indirect taxes over imports), we added residual indirect tax revenue to sectorial tax payments. In order to find the indirect tax on sectorial output, we used data from the Ministry of Finance, where a large portion of the indirect taxes are collected from the sale of oil and cars.[8]

The sum of the activity account ($SAM_{10,1}$) was carried to the commodity account, where we subtracted government subsidy payments ($SAM_{1,7}$) and exports ($SAM_{1,9}$) from the activity total in order to find the value of commodities sold in domestic markets.

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[5] SIS released input-output data for 1996 in 2002, and we use the input-output table as the use table. The other data are gathered from various sources, including SPO, CBRT, the Treasury and the Ministry of Finance.

[6] Net indirect tax payments are calculated as a difference between the gross indirect tax payments and the production subsidy received from government.

[7] Similar treatment is made by Kose and Yeldan (1996). The majority of the government's current expenditures are payments for civil servants, and the depreciation allowances in the SIS table is a very minor part of the current expenditures—less than 2 percent.

[8] The calculation of indirect tax is explained in detail below.

Although the coverage of production-related subsidies distributed by the government is more than implied in the input-output table, we did not find any disaggregated sector-level data for other form of subsidies and therefore maintained the assumption of the input-output table. In the input-output table, the amount of subsidy is equal to the government transfers to SEEs for their duty losses.

The absorption in the economy ($SAM_{2,10}$) is equal to the sum of domestic supply ($SAM_{2,1}$), imports ($SAM_{2,9}$) and government indirect tax revenues on imports ($SAM_{2,7}$).

We assumed that total labor earnings are directly distributed to households ($SAM_{3,5}$). The part of the operating surplus received by the government ($SAM_{4,7}$) and the operating surplus for the agricultural sector is distributed to households.[9] The enterprise account ($SAM_{4,6}$) receives the remaining operating surplus.

Household-consumption expenditures, income tax payments and savings are calculated in the fifth column. The consumption expenditures were calculated from the use table. The income tax payments were calculated from fiscal and financial statistical data, and the savings were calculated as residual.[10]

In the enterprise account ($SAM_{i,6}$), stock changes were recorded as payments made by the enterprises.[11] We derived the income tax payments of private enterprises from public finance statistics. The private sector's interest payments for foreign debt were calculated from balance-of-payments statistics. We subtracted the government's foreign interest payments (calculated from fiscal statistics) from the total interest payments (balance-of-payments statistics) and took the residual as the private sector's interest payments to international financial markets.

In order to find the savings of the private enterprises, we used the net increase in deposits of the private firms into the banking system from 1996 to 1995, where we employed data from the electronic data-delivery system of CBRT. The dividend payments to households were calculated as residual.

3.1. Details for Government Accounts

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[9] According to Yeldan (1997), more than 99 percent of lands in the agricultural sector belong to households, and less than 1 percent is controlled by corporations. Therefore, we directly distribute the operating surplus in agriculture to households.

[10] The calculation for household income explained in detail below.

[11] We will discuss some inconsistency in the stock changes in the official data.

Because most of the applied models focus on the government's policies, the row and column account for the government requires particular attention. The government's current and investment expenditures are calculated from the use table. The interest payments to both domestic and foreign markets are calculated from official fiscal statistics.

In Turkey, there are three different budgets. The calculation of the overall budget deficit requires combining these three budgets into a single budget system, which we call the overall public-sector budget. To find the overall government budget deficits, we combined the budget deficits/surplus of the Consolidated Budget, the Municipal Budget and the Budget of the Provincial Special Institution. The income-expenditure difference of the consolidated budget is equal to 1,238 trillion TL. For the same year, municipal institutions collected 362 trillion TL and spent 384 trillion TL. Province special administrations collected 92 trillion TL and spent 68 trillion TL, which implies that the former had a budget deficit of 22 trillion TL and that the latter had a 24 trillion TL surplus. The public-sector deficit is equal to the sum of these three accounts, which gives a total government budget deficit of 1,240 trillion TL.

After subtracting current, investment, and interest expenses and subsidy payments from the total government expenditure, we assumed that the remaining expenditures are government transfer payments to households.[12]

Total indirect income tax revenue was 1,701 trillion TL, the total direct income tax collection 966 trillion TL, the factor income total 675 trillion TL and other nontax income 168 trillions TL, all of which indicate a total government revenue of 3,510 trillion TL.

In the SIS (2002b), the indirect taxes collected from production totals 837 trillion TL. From government statistics, the taxes collected from foreign trade are 458 trillion TL. The remaining indirect tax was calculated as residual and amounted to 405 trillion TL and was collected mainly from the consumption of oil and the purchase of cars, etc. and are calculated from fiscal statistics by SIS (2002b).The tariff rate for a particular commodity was calculated according to the effective protection rate calculated in Harrison, Rutherford and Tarr (1996).

Non-tax income, consisting of government fees and fines, were distributed according to the share of direct income tax payments of economic institutions. The taxes on corporations were taken from government statistics and amount to 187 trillion TL (with the adjustment of non-tax income to 224 trillion TL). The

[12] See DeSantis and Ozhan (1996) for similar treatment.

implied income tax for households was calculated as residual and equals 910 trillion TL.

The tax-included current and investment spending for the government was calculated directly from SIS (2002b) by adjusting the government's commodity demand inclusive of indirect taxes. The government's current and investment expenditures are respectively 1,752 trillion TL and 750 trillion TL. In 1996, an interest payment for domestic liabilities was 1,329 trillion TL, while transfers to SEEs totaled 243 trillion TL. Other transfer payments (e.g., tax rebates, Social Security payments) specified in the consolidated budget were calculated as residual and assumed to be distributed directly to households.[13]

3.2. Details for Balance-of-Payments Accounts

In the SIS use table (2002a), net factor incomes from abroad are given as a number regardless of what institutions pay, or receive income from, abroad. In this study, we disaggregated the components of net factor income and distributed each payment (income) according to the respective institutions undertaking these transactions.

Net factor income in the balance-of-payments accounts includes remittance income, interest earnings, entrepreneur income and interest expenditures.[14] The net factor income from abroad in the national accounting statistics for 1996 was 206 trillion TL (or 2,540 trillion USD). In the official statistics for the consolidated budget, the interest payments for the foreign debt are 168 trillion TL. The private sector interest payments are calculated as residual.[15]

3.3. Details for Stock Changes

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[13] In the SIS Household Income Distribution Survey Data (2003), the government transfers are taken as a single account. In order to create consistent data and to avoid ad hoc assumptions about the distribution parameters for each type of household from each type of transfer, we did not consider further disaggregating the data. However, the SAM we designed is flexible in terms of adding new accounts for applied research.

[14] In the study, we used the exchange rate calculated according to net factor income in national accounting in TL to net factor receipts from the rest of world from balance-of-payments statistics. Thus: (EXR = NFI(TL)/NFI($))= 81,085.43TL.

[15] Although the CBRT is considered to be a public institution in balance-of-payments and foreign-debt statistics, in public-sector statistics, the CBRT is considered to be a private institution. The official statistics would underestimate the actual interest payments of the overall public sector as Kose and Yeldan (1996) argue. However, because part of the budget deficit is financed through sources from the CBRT, we followed the official government statistics.

In the national-income accounts, the total stock-changes in the economy, based on current prices, are -79 trillion TL while in SIS (2002a)[16] it is 993 trillion TL Moreover, in the national-income statistics, the statistical difference between the expenditure method and the income method show a difference of -553 trillion TL. Kose and Yeldan (1996) find a similar inconsistency with the stock data in the input-output table for 1990. As Kose and Yeldan (1996) argue, the stock-change in services could be possible only if there is an opportunity to store the services. We believe that a positive or negative stock-change in the service sector is not logical, as indicated by SIS (2002b), and therefore we eliminated service-sector stocks in the system. In order to reestablish consistency (i.e., a balance in the row and column sum for the stock-change account; we distributed this difference to other institution accounts according to their share in final demand.

4. DISAGGREGATED 1996 SAM FOR TURKEY

The disaggregated SAM for Turkey consists of 48 accounts. Seventeen of the 48 accounts are production or activity accounts. Another 17 are commodity accounts. The remaining accounts are three primary factors of production, three households, one government, one enterprise, one stock-change, one income tax, one domestic indirect tax, one tariff revenue, one saving-investment and one rest-of-world

In table 2, we provide summary information about each account. The first part covers both production and commodity accounts. As in the original SIS table (2002b), we assume that each sector is producing one commodity. Therefore, we denote *A(i)* for production and *C(i)* for commodity, where *i=1,2, . . .17*. In the first column, CODE describes the code number, or shorthand definition, of accounts we used in the study. In the activity/commodity section, we provided the broad classification of the industries and their respective ISIC (International Standard Industrial Classification Number) code.

The data for activity, commodity and factors of production are adopted from the SIS input-output table[17] (2002a). The data for government-related accounts were derived from the following sources: SIS fiscal and financial statistics (2002b), the electronic data-delivery system of the Central Bank of Turkey, the electronic data-delivery system of the State Planning Organization and the National

[16] Note that both statistics are produced by the SIS.

[17] The input-output table is reorganized according to the tax, subsidy and stock-change adjustments we described above.

Income Year Book of the Treasury (2001). In order to calculate the sectorial level of the effective tariff rate, we borrowed data from Harrison, Rutherford, and Tarr (1996). The balance-of-payments data also were derived from the same data sources we describe for the government-related accounts. The sectorial level for imports was derived from the SIS supply table (2002a). The sectorial level of exports was derived from the SIS use table (2002a).

We provide household-related data in table 3. In order to calculate household-related variables, we used the following sources: Household Budget Survey Preliminary Results for 2002 (SIS,2003), Household Consumption Expenditure Survey for 1994 (SIS,1997), the TUSIAD report (2000) and Yeldan (1997).

Following Yeldan (1997), we assumed that remittance income is distributed 50 percent for HHP and HHM. In order to calculate share parameters from labor, agricultural operating surplus, entrepreneur income and government transfer payments, we used the 1994 SIS Household Income Distribution Survey (1997) and the TUSIAD report (2000) on income distribution and poverty.

After calculating the respective gross-income figures, we calculated the tax payments of each household. In Turkey, the income tax covers both incomes from primary factors of production and transfer payments. The exception is that in the tax system, the agricultural entrepreneur income has been provided a significant tax exemption. Following DeSantis and Ozhan (1997), we assumed that agricultural entrepreneur income is tax-exempt. The total withholding taxes for 1996 were 574 trillion TL. We distributed this tax over households according to their labor-income share. The remaining income tax collection of government is distributed to households according their gross income share in the total gross income.

In order to determine consumption spending by the households, we used the SIS Household Budget Survey (2003), which provides information for 1994 and 2002. In the SIS use table (2002b), household final consumption for each commodity was calculated as residual. However, the coverage of the commodity groups in the consumption survey does not match the classification in the use table. The definition of commodities in the consumption survey is not clear, either. In order to reconcile the differences, we first distributed commodities that are identical in both data sets (i.e., agriculture, food, textile, transportation, telecommunication, wood and furniture, etc.). Some of the commodities with different ISIC numbers in the use table were combined into one account in the consumption table. For example, energy (ISIC 69-71) and household dwelling (ISIC 97) were combined as a single item in the consumption survey. Using vertical and horizontal specification in the consumption survey, we adjusted

each household-category spending so that total spending in each category is consistent with both the use-table sum and the household-consumption share parameter implied in the consumption survey. After this allocation, the remaining consumption spending for each type of household and commodity was calculated by using a simple distributive share that we calculated from the consumption survey. In order to bring the row and column sums into equilibrium, we used the Cross Entropy method, which is discussed in the next section.

5. BALANCING THE SAM

The data we used to construct the SAM came from various sources (e.g., input-output table, government accounts, balance-of-payment accounts, household-income consumption surveys, income-distribution surveys). These data were collected in different time periods and were evaluated with different prices.[18]

Due to measurement errors (and possible sampling errors), incompatible data sources or lack of data, researchers suffer from inconsistency of the sum between columns and rows. The problem in estimating a disaggregated SAM for a recent year stems from the need to find an efficient (and cost-effective) way to incorporate and reconcile information from a variety of sources, including data from prior years (Robinson, Cottoaneo and El Said, 2000, p. 1). In this part, we discuss the theoretical underpinnings of the Cross Entropy approach, which we used as a balancing tool in the household account.

From the macro SAM, we know the exact sum of the columns and rows, which are identical. The sums of the submatrices in disaggregated accounts are expected to be equal to their corresponding aggregated vectors, which we calculated for the macro SAM. In the household submatrix, we know household gross income, tax payments and total consumption spending. However, the available data resulted in inequality between column accounts and row accounts in household consumption space.

The Cross Entropy approach is based on information theory developed by Shannon (1948). The estimation procedure is simply minimizing the Kullback-Leihler (1951) cross-entropy measures between the new and prior estimated

[18] Yearly CPI inflation in the 1990s was higher than 50 percent in the last decade. The disaggregated price movements did not necessarily follow CPI inflation on a one-to-one basis. Moreover, due to frequent crises, the excess fluctuations in the exchange rate also affect the domestic price of imported commodities.

probabilities. The method is introduced into the SAM literature by Golan, Judge and Robinson (1994).

Because we know the column sum (total consumption expenditure of each household), the total of commodity "c" for households and some of the distribution parameters in household consumption space, we want to find the distribution parameters for those commodities that were purchased by each type of household for which we do not have complete information.

Assume that QH_h is household h's total consumption spending and its purchase of good c is $t_{c,h}$ and QQ_c is the available quantity of commodity c for final consumption for the households. The sum of household h's expenditure on each good is expected not to exceed its total consumption spending as in CASE-A below. Assume that the existing household- consumption matrix in the SAM gives results such as in CASE-B.

$$\xrightarrow{CASE-A} QH_h = \sum_c^n t_{c,h} \qquad AND \qquad QQ_c = \sum_c t_{h,c}$$

$$\xrightarrow{CASE-B} QH_h \neq \sum_c^n t_{c,h} \qquad AND \qquad QQ_c \neq \sum_c t_{h,c}$$

Assume that there exists a coefficient matrix in the consumption household space such that:

$$A^*_{ch} = \frac{t_{c,h}}{QH_h} \qquad and \qquad QH_h = \sum_c^n t_{c,h}$$

and the initial unbalanced coefficient-matrix in the consumption household space is represented by $\overline{A_{c,h}}$, where the sums of columns or rows do not match the values calculated in the macro SAM.

If $\overline{A_{c,h}}$ is our prior information, and assuming we know QH_h with certainty, we can apply Kullback-Leibler (1951) measures of Cross Entropy probability distribution to the Cross Entropy SAM estimation. The problem is to find a new set of A^*_{ch} that minimizes the cross-entropy distance between the A^*_{ch} and $\overline{A_{c,h}}$

and also satisfies equilibrium conditions. Thus we solve the constraint-optimization problem in the form[19]:

$$\min H = \sum_c \sum_h A^*_{c,h} \ln \frac{A^*_{c,h}}{A_{c,h}} = \sum_c \sum_h A^*_{c,h} \ln A^*_{c,h} - \sum_c \sum_h A^*_{c,h} \ln \overline{A_{c,h}} \quad (1)$$

$$\text{Subject to } \sum_h A^*_{c,h}.QH_h = QQ_c \quad (2)$$

$$\sum_h A^*_{ch} = 1 \quad (3)$$

$$0 \le A^*_{c,h} \le 1 \quad (4)$$

Because the objective equation involves a natural logarithm, we need to add epsilon small number to the arguments of the equation. Applying a similar analogy in the Walrasian system of general equilibrium, because if all but one column-and-row sum are equal, then the last one must also be equal; therefore, when we wrote the computer program for the cross entropy, we dropped equation 4.

In order to balance the SAM, we used the method we described above. In our SAM, we used the Cross Entropy method for the commodity-household space for the nine commodities. For the remaining seven commodities, we estimated consistent results, and therefore these accounts are held fixed. In appendix 2-1, we provide the GAMS code for the Cross Entropy balancing system we wrote for the study.

6. CONCLUSION

This study was aimed at constructing the first comprehensive and detailed 1996 SAM for Turkey. In order to eliminate inconsistency in data we use Cross Entropy method.

Although the data used in this study, in general, show relatively good consistency, in a few areas we had difficulty. First, we found that the data in the

[19] The system of equatins are solved by using GAMS. The basic alghoritm of the solution can be thought as classical constraint optmizatıon technique. The GAMS code for the research is available upon request.

SIS Household Budget Survey (2003) are not compatible with the SIS (2002b) input-output table in terms of classification of the commodities. Because in the input-output table there is a single household account and the consumption expenditures are calculated as residual, we had to use the SIS Household Budget Survey (SIS, 2003) for 2002 in order to calculate disaggregated private expenditures. Although SIS (2003) provides main picture in terms of income distribution, the commodity coverage in this survey does not conform to the input-output classification. Therefore, some assumptions have been made in order to complete the estimates of the household-consumption expenditure matrix.

Second, as described by DeSantis and Ozhan (1997), we did not find comprehensive indirect tax rates over the each commodity we included in the system. It is very unfortunate that there is no official published data that portray disaggregated, indirect tax rates according to the ISIC code system.

Due to the shortcomings we explained above, we conclude that the data generation should be connected to some standards, such as ISIC code system. Therefore, when other researchers use the SAM we constructed, they should take account of these caveats.

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Table 1 : Turkish Macro SAM for 1996[1] (Trillion TL)

	1	2	3	4	5	6	7	8	9	10
1 A		243448					2434		36532	282414
2 C	117523				107582	7791	24382	32053		289331
3 L	32735									32735
4 K	119733									119733
5 HH			32735			103811	8024		291	144861
6 ENT				112985			1329		255	114569
7 G	12423	4585		6748	9095	2244				35095
8 S-I					28184	550	-1240		4561	32053
9 ROW		41299				173	168			41640
10 Total	282414	289332	32735	119733	144861	114569	35097	32053	41639	1092431

Source: Our own calculation based on the 1996 SIS Input-Output Table (2002a). Tax data are based on SIS financial statistics for Turkey (2002b). Transfer data are calculated from electronic data-delivery services of the SPO, the Treasury and the Central Bank.

[1] Due to rounding, there are slight differences between the row and the column sum. The disaggregated SAM does not have rounding, and therefore the reader should use the numbers in the disaggregated SAM.

Note: The data for the rest of the world is evaluated according to an exchange rate of 1US$=81,085.43TL.

Abbreviations: AC, activity; CO, commodity; L, labor; K, capital and land; HH, households; ENT, private enterprises; G, government; S-I, saving investment (by sector of destination); and ROW, rest of world.

Table 2: Nomenclature of the Accounts

PART I: ACTIVITY AND COMMODITY ACCOUNTS		
CODE*	Sector/Commodity Name	ISIC Code
A1-C1	Agriculture and Animal	01-07
A2-C2	Mining and Quarrying	08-12
A3-C3	Food and Food Processing	13-25
A4-C44	Textile and Footwear	26-32
A5-C5	Light Manufacture I: Wood, Furniture, Etc.	33-37
A6-C6	Petroleum	38
A7-C7	Chemical	39-42
A8-C8	Light Manufacture II: Plastic, Glass, Ceramic, Etc.	43-49
A9-C9	Steel, Iron and Other Metals	50-52
A10-C10	Heavy Manufacture: Engine, Electrical and Electronic	53-68
A11-C11	Energy	69-71
A12-C12	Construction	72
A13-C13	Tourism	76-77
A14-C14	Transportation	78-82
A15-C15	Finance	84-85
A16-C16	Other Private Services	73-75,83-86, 95
A17-C17	Government Services	96
PART II: FACTORS OF PRODUCTION		
LAB	Wages for Labor	
CAP	Operating Surplus	
LAND	Operating Surplus in Agriculture	
PART III: DOMESTIC INSTITUIONS		
HHP	Households in Bottom 30% of the Income Distribution	Household Income
HHM	Households in 30% to 70% of the Income Distribution	Household Income
HHR	Households in Top 30% of the Income Distribution	Household Income
GOV	Government	Fiscal and Financial
ENT	Private Enterprises	National Income Account,
PART IV: TAXES		
STAX	Indirect Tax Revenue from Domestic Commodities	Fiscal and Financial
TAR	Tariff Revenue from Imports	Fiscal and Financial
YTAX	Income Tax and Other Fees and Penalties	Fiscal and Financial
PART V: CAPITAL ACCOUNT		
STK	Stock Changes	National Accounting
S-I	Savings in Row Account, Investment by Sector of	National Accounting,
PART VI: REST OF WORLD		
ROW	Rest of world	Balance-of-Payments

(*) Throughout the study, we will use this code. The code number is *A(i)* when it is production-related and *C(i)* when it is marketed as a commodity.

Table 3: Household Supplementary Data for the SAM

	HHP	HHM	HHR
1-Labor Income %	14	34.2	52.8
2-Operating Surplus in Agriculture %	6	29.2	64.8
3-Enterpreneuer-(Nonagriculture) %	5.8	26	68.2
4-Transfer Income			
4a-Government %	12.1	21.6	66.3
4b-Remittance %	50	50	-
6-Implied Gross Income (trillions TL)	12,052	42,377	96,394
6a-Witholding Tax (trillions TL)	804	1,963	2,973
6b-Other Income Taxes (trillions TL)	268	943	2,144
6c-Total Income Tax (a+b)	1,071	2,906	5,118
7-Disposable Income	10,980	39,471	91,276
8-Consumption Expenditures	10,296	33,045	64,240
9-Savings	685	6,425	27,035

Source: Our own calculation, based on SIS Household Income Distribution Survey (1997), TUSIAD (2000), SIS Fiscal and Financial Statistics (2002b), SIS Household Budget Survey (2003)

Table 4. Turkish SAM for 1996 (in Trillions TL)

	A1	A2	A3	A4	A5	A6	A7
A1							
A2							
A3							
A4							
A5							
A6							
A7							
A8							
A9							
A10							
A11							
A12							
A13							
A14							
A15							
A16							
A17							
C1	7536	9.95	5239	1357	345.9		11.04
C2	8.53	1.63	43.5	14.44	1.69	2865	162
C3	803.9	0.08	2594	208.1	7.8	0.17	43.85
C4	97.15	3.08	57.36	5511	12.04	0.69	9.17
C5	73.42	3.11	251.2	96.97	1615	0.89	19.19
C6	865.4	105.9	196	227.7	74.52	5.18	200.9
C7	1148	8.32	114.9	535	122	23.11	1272
C8	290	25.49	290.9	443.3	51	9.94	121.1
C9	9.3	9.77	38.33	10.71	2.86	2.81	1.85
C10	329.2	47.07	320.4	261.7	183.4	9.33	98.9
C11	169.9	57.51	295.9	482.8	151.1	56.32	151
C12							
C13	22.28	0.33					
C14	535.6	60.22	917.2	420.7	246.6	319.3	217.8
C15	1752	53.95	188.2	402.6	135.6	5.18	142.5
C16	959.7	99.79	1680	813.7	460.6	110.6	455.6
C17							
LAB	2814	429.9	861.2	1219	314.1	56.81	364.3
CAP		1337	4800	4406	2008	1151	1673
LAND	21816						
HHP							
HHM							
HHR							
GOV							
ENT							
STK							
STAX	816.1	58.12	1294	193.5	56.2	6430	118.4
TARIFF							
S-I							
ROW							
TOTAL	40046	2311	19182	16605	5788	11046	5063

Table 4. (Continued)

	A8	A9	A10	A11	A12	A13	A14
A1							
A2							
A3							
A4							
A5							
A6							
A7							
A8							
A9							
A10							
A11							
A12							
A13							
A14							
A15							
A16							
A17							
C1	99.13	0.19	3.6	2.49	68.8	634.3	32.18
C2	442.4	343.9	36.82	833	359.8	15.36	11.12
C3	57.18	0.03	0.5	4.04		1358	524.7
C4	49.13	2.48	163.9	13.1	1.76	2.65	11.73
C5	140.8	40.12	541.1	12.72	359.5	124.9	79
C6	184.8	231	115.2	210	366.4	89.78	4520
C7	1259	37.43	285.4	7.66	209		65.71
C8	764.5	30.62	367.5	6.77	2801	109.3	413.6
C9	104.3	2098	3129	2.91	2325		14.39
C10	276.5	192.5	4414	52.73	909.3	135.7	805.3
C11	480.9	516.9	438.2	166.8	187	258.7	45.94
C12							
C13				3.86		36.64	1097
C14	447.1	485.4	1013	141.2	951.7	450.2	1452
C15	289.1	93.48	445.5	30.79	433.6	141.7	152.5
C16	640.8	606.6	2093	127.1	1889	647.8	2491
C17							
LAB	699.9	458.1	1554	641.4	953.1	1551	2798
CAP	3487	1886	8695	3051	7579	2680	15811
LAND							
HHP							
HHM							
HHR							
GOV							
ENT							
STK							
STAX	122.3	98.77	556.6	32.46	127.9	56.79	203.8
TARIFF							
S-I							
ROW							
TOTAL	9545	7121	23852	5340	19521	8293	30529

Table 4. (Continued)

	A15	A16	A17	C1	C2	C3	C4
A1				38540			
A2					2311		
A3						19162	
A4							16605
A5							
A6							
A7							
A8							
A9							
A10							
A11							
A12							
A13							
A14							
A15							
A16							
A17							
C1	0.6	62.36					
C2	4.12	90.16					
C3		90.84					
C4		70.95					
C5	318	867.8					
C6	53.32	462.3					
C7		327.3					
C8	20.86	481.2					
C9		136.6					
C10	49.53	1414					
C11	189.4	952.3					
C12		366.9					
C13	24.31	686.5					
C14	342.4	1206					
C15	840.1	3655					
C16	1222	4608					
C17							
LAB	1711	4440	11869				
CAP	5175	34177					
LAND							
HHP							
HHM							
HHR							
GOV							
ENT							
STK							
STAX	86.04	2172					
TARIFF				203.9	9.09	362.6	229
S-I							
ROW				1713	4187	1979	2259
TOTAL	10038	56267	11869	40457	6507	21504	19092

Table 4. (Continued)

	C5	C6	C7	C8	C9	C10	C11
A1							
A2							
A3							
A4							
A5	5788						
A6		11046					
A7			5063				
A8				9545			
A9					7121		
A10						23852	
A11							5309
A12							
A13							
A14							
A15							
A16							
A17							
C1							
C2							
C3							
C4							
C5							
C6							
C7							
C8							
C9							
C10							
C11							
C12							
C13							
C14							
C15							
C16							
C17							
LAB							
CAP							
LAND							
HHP							
HHM							
HHR							
GOV							
ENT							
STK							
STAX							
TARIFF	91.56	87.27	1768	329.9	319.4	1184	0.65
S-I							
ROW	892	973.5	3916	2335	4480	15101	10.2
TOTAL	6772	12107	10747	12210	11921	40138	5319

Table 4. (Continued)

	C12	C13	C14	C15	C16	C17	LAB
A1							
A2							
A3							
A4							
A5							
A6							
A7							
A8							
A9							
A10							
A11							
A12	19521						
A13		8293					
A14			29746				
A15				10038			
A16					56172		
A17						11869	
C1							
C2							
C3							
C4							
C5							
C6							
C7							
C8							
C9							
C10							
C11							
C12							
C13							
C14							
C15							
C16							
C17							
LAB							
CAP							
LAND							
HHP							4583
HHM							11196
HHR							16957
GOV							
ENT							
STK							
STAX							
TARIFF							
S-I							
ROW	23.49	955.8	1423	68.53	983		
TOTAL	19545	9249	31169	10106	57155	11869	32735

Table 4. (Continued)

	CAP	LAND	HHP	HHM	HHR	ENT	STK
A1							
A2							
A3							
A4							
A5							
A6							
A7							
A8							
A9							
A10							
A11							
A12							
A13							
A14							
A15							
A16							
A17							
C1			2067	6590	12754		1460
C2			12.85	84.11	485.5		454.2
C3			2381	5371	5450		
C4			421.9	1362	2858		2373
C5			113.8	433.9	1178		161.8
C6			509.1	1643	3445		-2172
C7			296.5	956.9	2007		1591
C8			372.7	790.7	2937		365.3
C9			70.21	225.5	473.5		1856
C10			935.4	2370	6984		1702
C11			38.56	124.8	261.7		
C12							
C13			103.9	1449	3385		
C14			519.4	3815	8663		
C15			41.07	132.4	277.2		
C16			2412	7698	13081		
C17							
LAB							
CAP							
LAND							
HHP		1309				5148	
HHM		6370				23077	
HHR		14137				60532	
GOV	6748		1072	2906	5119	2245	
ENT	91168						
STK						7791	
STAX							
TARIFF							
S-I			684.5	6425	27036	5747	
ROW						173.3	
TOTAL	97916	21816	12052	42377	96394	104713	7791

Table 4. (Continued)

	STK	STAX	TARIFF	S-I	ROW	TOTAL
A1						40046
A2						2311
A3						19182
A4						16605
A5						5788
A6						11046
A7						5063
A8						9545
A9						7121
A10						23852
A11						5340
A12						19521
A13						8293
A14						30529
A15						10038
A16						56267
A17						11869
C1	1460			56.07	1655	40457
C2	454.2				230.2	6507
C3					2492	21504
C4	2373			1.13	5795	19092
C5	161.8			4.06	276.2	6772
C6	-2172				221.6	12107
C7	1591				417.5	10747
C8	365.3				1414	12210
C9	1856				1404	11921
C10	1702			14388	2638	40138
C11					21.62	5319
C12				13950		19545
C13					1782	9249
C14				1287	6365	31169
C15					312.9	10106
C16				2368	11507	57155
C17						11869
LAB						32735
CAP						97916
LAND						21816
HHP					145.5	12052
HHM					145.5	42377
HHR						96394
GOV		12423	4586			35098
ENT					255	104713
STK						7791
STAX						12423
TARIFF						4586
S-I					4562	32054
ROW						41640
TOTAL	7791	12423	4586	32054	41640	