

## **A Quantitative Analysis of Circular Flow of Iranian Economy based on Social Accounting Matrix 1996**

Manoochehr Asgari, Ph.D.\*  
Ali Asghar Banouei, Ph.D.\*

### **Abstract**

*The Social Accounting Matrix (SAM) and its related models were designed to circumvent many restrictions inherent in the National Accounting practices. The goal was quantitative and simultaneous analysis of economics and social problems facing many of developing countries. Iran was the first country to adopt this accounting system. In the fifth plan of Iranian economy in 1973, the senior consultant from the International Labor Organization (ILO) proposed guideline for Iranian planners. The Iranian experience was carefully expanded to include other countries of the world by the same organization. The result of this experience in Iran was numerous books and articles that were published in internationally reputed journals.*

*The debate that followed paved the way for development of a system of national account with a domestic flavor. Two of the main results of these intellectual challenges were the complete revision of the System of National Accounts of 1968 in which the importance of the role of meso level accounting, and the applications of Theory of General Equilibrium were recognized. While the Iranian experience had a tremendous effect at the international level, in Iran, it was forgotten by the academia for over two decades.*

*The design of meso level accounting system in the form of social accounting matrix is the second experiment in Iran which is based on the experience of other countries and United Nation System of National Accounts (1993). The SAM for Iran is presented in three levels of aggregation: The MacroSAM, which has 10 rows and columns, The MesoSAM which has 33 rows and columns, and finally the MicroSAM which has 94 rows and columns. In this article the circular flow of Iranian economy for 1996 based on MesoSAM is presented.*

**Keywords:** Social Accounting Matrix, Mixed Income, National Accounts

---

\* Assistant professor, Faculty of Economics, Allameh Tabatabaie University

## Introduction

Almost three decades ago there was not a logical relation between income distribution data and social analysis based on national accounts. The linkage needed a theoretical background which was lacking at that time. National accounts are not suitable for a wide range of economic analyses including the poverty and welfare of a society.

For this reason the social accounting matrix was designed to tackle this and other social and economic problems facing many of the developing countries. In the words of Richard Stone, the main architect of the new accounting system:

"In the SNA the production accounts are divided by products but the income and outlay accounts are only divided by the main sectors, companies, households, government and so on, with no subdivision of the household sector that was recognized as a deficiency at that time and something had to be done to repair it. Although studies of the distribution of personal income by size have long been made, the lack of classification of households means that the SNA as it stands cannot be used to study distribution in detail, in the way that it can be used to study production. This is a serious shortcoming and substantial efforts to repair this gap have been made in recent years by Pyatt and his colleagues at the ILO and the World Bank".<sup>(1)</sup>

Graham Pyatt and Jeffrey Round who have done a series of valuable research studies in the improvement of social accounting matrix and its application on the social and economic problems of developing countries argue :

"At that time the structure of the welfare state in the UK was well established so that questions of employment opportunities and care of the needy were not pressing. The issue which caused most concern were those of economic growth and not income distribution"<sup>(2)</sup>

The recent development in local and international economic spheres makes it more imperative to implement the necessary revision in the system of national account. Steve Keuning, the director of Holland census bureau defines these development as follows:

"The decentralization (from top to bottom), the globalization, the importance of service and information economy in economic growth, and finally the coordination of economic, social and environmental policies."<sup>(3)</sup>

Without doubt the improvement in the existing system of accounting in confronting the above mentioned four cases and also simultaneous analyses of economic, social and environmental problems cannot be achieved without reconciling the consumption and incomes of households in the most disaggregated form in line with other accounts and sub accounts.<sup>(4)</sup>

Rugg  
necessar  
groups  
system  
based o  
assume  
and its r  
theoret  
emphas  
structur  
changes  
clearly  
organiz  
essenti  
this ki  
because  
the pro  
units.<sup>(6)</sup>

Base

as:

"A ma  
account  
econor  
connec  
socio-e  
possib

This  
account  
circula  
accum  
last se

In p  
refer t  
account  
kinds  
Factor  
SAM,  
organ



Ruggles and Ruggles discuss theoretical macroeconomics and the way the necessary data are to be obtained in order to analyze the socio-economic groups and households consumptions and improvement in the existing system of accounts. They observe that at the micro level the decisions are based on micro behavior in partial equilibrium setting, all other factors assumed to be fixed. Therefore, the logical connection between these units and its relation with the structure of the economy is not an easy task, because theoretically the structure is given. On the other hand, macroeconomics emphasized the importance of macro variables. Also, in this approach the structure of the economy is accepted, thus the overall and macroeconomic changes are assumed to be affected by partial changes. These observations clearly define the demarcation of micro and macroeconomics in the organization of data sources. The reason is that basic data and information is essential for the design of a wide variety of macroeconomic models. Also this kind of consistent statistical system is theoretically justified. But, because of macro nature, especially the households sectors cannot be used in the problem related to the structure of economics and behavior of micro units.<sup>(6)</sup>

Based on the argument above, a social accounting matrix can be defined as:

"A matrix presentation of sequence of monetary accounts in which each account defines an economic process with the logical relation with other economic processes. The sequence of accounts are mainly made by connection between economic structure and distribution and cost among socio-economic groups. The consistency among these accounts is only possible at the meso level."

This article is organized as follows: in Section 2, the structure of social accounting matrix for Iran in the year 1996 is presented. In Section 3, the circular flow of Iranian economy (production, distribution, consumption, accumulation, flow of funds, and the rest of the world ) is presented. The last section contains the results and summary.

In presenting the accounts and sub accounts in a matrix form we have to refer to two things: first in order to organize the data and information of accounts and the logical relation between them, it is necessary to define four kinds of statistical units. These units are 1. Products, 2. Establishment, 3. Factors of Production, 4. Institutions. The individual units cannot be used in SAM, they must first be grouped as a related category. Second, the organization of accounts and sub accounts make it possible to use more than

one unit in each account or sub accounts. <sup>(7)</sup> As an example, in production account we use two units of ISIC<sup>1</sup> and CPC<sup>2</sup>. <sup>(8)</sup>

## 2. The Structure of the Social Accounting Matrix for Iran

Table 1 shows the circular flow of the Iranian economy in 1375 (1996). The figures in the table are all billion rials in current prices. Table 1 has 33 rows and 33 columns making it a square matrix. The row and column 33 contains the totals for all of the rows and columns of the table. The other 32 rows and columns show the accounts. There are 10 accounts which correspond to the accounts enumerated in the Iranian MicroSAM. The information contained in Table 1 is more detailed than the corresponding accounts in the MacroSAM, but less detailed than the MicroSAM. <sup>(9)</sup> Table 1 is more or less comparable to the detailed aggregate national account and has been produced having such a comparison in mind.

The accounts in Table 1 are as follows: Goods and Services Account (rows and columns 1 to 3), Activities Account (rows and columns 4 to 6), Generation of Income Account (rows and columns 7 to 13), Allocation of Primary Income Account (rows and columns 14 to 16), Secondary Distribution of Income Account (rows and columns 17 to 19), Consumption of Income Account (rows and columns 20 to 22), Capital Account (rows and columns 23 to 25), Capital Formation Account (rows and columns 26 to 28), Financial Account (rows and columns 29 to 31), and The Rest of the World Account (row and column 32).

### 2.1 Goods and Services Account

The Goods and Services Account contains three kinds of goods and services: agricultural commodities, industrial commodities, and services commodities. The unit in this account is CPC (Central Product Classification).

### 2.2 Activities Account

Three activities are included in this account: agricultural activities, industrial activities<sup>(10)</sup>, and services activities. The unit of this account is ISIC (International Standard Industrial Classification). <sup>(11)</sup>

### 2.3 Generation of Income Account

Seven categories are included in this account: urban private wage earner, urban public wage earner, rural private wage earner, rural public wage

---

1. International Standard Industrial Classification

2. Central Product Classification



earner, mixed income, operating surplus, and taxes. The unit of account is value added or employment.

#### **2.4 Allocation of Primary Income Account**

Three institutions are considered in this account: households, corporations, and government. The unit of account is institution.

#### **2.5 Secondary Distribution of Income account**

Households, corporations and government institutions are included in this account.

#### **2.6 Consumption of Income Account**

This account contains the three institutions, namely households, corporations, and government.

#### **2.7 Capital Account**

The units in this account are the same as above.

#### **2.8 Capital Formation Account**

This account contains activities, namely, agricultural activities, industrial activities, and service activities.

#### **2.9 Financial Account**

The unit in this account is asset. There are three kinds of assets: money, loan and others.

#### **2.10 The Rest of the World Account**

This account does not have a unit, because it contains all of the above mentioned activities, commodities and assets.

In the Social Accounting Matrix presented in this paper we have three kinds of commodities, three kinds of activities, three institutions, seven factors of production, and three kinds of assets.

### **3. Analysis of the Circular Flow of the Iranian Economy**

#### **3.1 (Goods and Services & Goods and Services)**

The intersection of goods and services with goods and services shows the trade margin. For example, in 1996, the agricultural goods have paid 14,916 billion rials to services for transportation. This table also has another purpose and that is to add the trade margin to output so that the supply side of the

economy is calculated based on market prices. This will make the rows and columns of SAM more comparable since the rows are already based on market prices.<sup>(12)</sup>

### 3.2 (Goods and Services & Activities)

The intersection of goods and services and activities, that is, rows 1&2&3 and columns 4&5&6, shows the absorption matrix. In 1996, agricultural activities in the process of production have consumed 8,239 billion rials of agricultural commodities (row 1 and column 4). This is of course the intermediate demand of agricultural activities. In the same year, agricultural activities have had other intermediate demand for industrial and services commodities (row 2 and column 4 and row 3 and column 4). Therefore, the total intermediate demand of agricultural activities in 1996 adds up to 20,595 billion rials, that being the sum of the three items above. Columns 5&6 and rows 1&2&3 contain intermediate demand of industrial and services activities for agricultural, industrial and service commodities. For example, the intermediate demand of industrial activities for agricultural commodities is 25,492 billion rials. For industrial commodities it is 69,254 billion rials, and finally for services commodities it is 6,321 billion rials.

The intermediate demand of agricultural activities is made up of 40% of agricultural commodities, 37% of industrial commodities, and 23% of services commodities. The comparable figures for industrial activities are 25%, 69% and 6% respectively. Services have the least amount of agricultural commodities as intermediate demand (about 1%) and the share of industrial and services commodities in total intermediate demand of services activities is almost the same. The tables show the amount of intermediate demand and their shares. (Note that the row and column numbers refer to the original rows and columns in Table 1)

### Absorption Matrix

	Activities		
	4	5	6
1	8239	25492	430
2	7634	69254	16687
3	4722	6321	17177
Total	20595	101067	34294

(percent)

	4	5	6
1	40	25	1
2	37	69	49
3	23	6	50



### 3.3 (Activities & Goods and Services)

In the intersection of rows 4&5&6 and columns 1&2&3 we have the Make Matrix (transposed). This matrix shows the output of activities. In 1996, agricultural activities have an output equal to 53,756 billion rials. This matrix is generally a block diagonal matrix. That is, the main entries are in the diagonals of the matrix. The Social Accounting Matrix (SAM) for Iran allows production of several commodities by one activity and one commodity by several activities. Therefore, we see that in 1996, agricultural activity has an output equal to 53,756 billion rials of agricultural commodities. This amounts to 91% of the total agricultural output which is 58,834 billion rials. In addition, agricultural activities have produced two other kinds of commodities in the same year. Industrial activity has an output equal to 197,984 billion rials. The output of service activity is 167,256 billion rials, 99% of which has been in the form of services commodities.

The Make Table also shows that agricultural product is produced solely by agricultural activities, while the industrial and services commodities are produced by other activities and it also shows the amount is not significant.

Make Matrix

	1	2	3	Total
4	53756	1479	3599	58834
5	0	193845	4139	197984
6	12	1892	165352	167256

(percent)

	1	2	3	Total
4	91	3	6	100
5	0	98	2	100
6	0	1	99	100

### 3.4 (Allocation of Primary Income & Goods and Services)

In the intersection of rows 14&15&16 (allocation of primary income) and columns 1&2&3 (goods and services account), the net taxes on imports (tariff minus subsidies) are shown. In row 16 and column 1, we see that in 1996, imports of agricultural products have paid the net taxes equal to -923 billion rials. The corresponding figures for industrial commodities is about 1,800 billion rials. Therefore, the net tariff for industrial commodities is positive while for agricultural commodities it is negative. These figures have been entered as government income (row 16).

	6
25	1
69	49
6	50

## Net taxes on imports

	1	2	3
16	-923	1881	0

**3.5 (Rest of the World & Goods and Services)**

In the intersection of row 32 and columns 1&2&3, imports of agricultural, industrial, and services are shown. In row 32 and column 1, the figure 2,928 billion rials, shows the amount of import of agricultural products. The import of industrial product is 27,000 billion rials (row 32 and column 2), which is almost 9 times as big as agricultural imports. The import of services is around 130 billion rials.

In row 33 and columns 1&2&3, the total outgoing of goods and services are shown. This is in line with the convention that the columns of SAM show outgoing and the rows show incoming. Therefore, the total (aggregate) supply of agricultural products (domestic production + imports...) are shown in row 33 and column 1, which is approximately 70,000 billion rials for the year 1996. The total (aggregate) supply of industrial goods (which is comprised of manufacturing, mining, building, electricity, water, gas etc.) is approximately 270,000 billion rials. The total (aggregate) supply of services commodities in the same year is about 114,000 billion rials. The sum of all these figures is 455,461 billion rials which is the aggregate supply of the economy in the year 1996.

## Imports

	1	2	3	Total
32	2928	27371	129	30428

## Aggregate Supply

	1	2	3	Total
33	70689	270546	114255	455461

**3.6 (Goods and Services & Consumption of Income)**

In the rows 1&2&3 and columns 20&21&22, the matrix of institutions consumptions is shown. Row 1 and column 20 show the consumption of

agric  
billio  
1996  
consu  
Almo  
by h  
rema  
agric  
indus  
gove

(
1
2
3
T

(p
1
2
3
T

3.7 (The  
The  
statist  
with  
affec  
of ro  
the y  
abou  
chan



agricultural goods by households. Households have consumed about 30,000 billion rials of agricultural products. The total consumption of institutions in 1996 is about 187,000 billion rials, with the households share of total consumption at about 82% and the government share of the total at 18%. Almost all of the agricultural and industrial products have been consumed by households. The share of households in services is about 60% and the remainder has been consumed by government (not shown here). The share of agricultural product in total households consumption is about 20%, that of industrial product 48% and services 32%. Almost 100 percent of government consumption is made of services commodities.

(percent)

	20	21	22	Total
1	29077	0	0	29077
2	73051	0	272	73323
3	50842	683	33289	84814
Total	152970	683	33561	

(percent)

	20	21	22	
1		19		
2		48		
3		33	100	100
Total		100	100	100

### 3.7 (Goods and Services & Capital)

The entries of this matrix usually show the changes in inventories and statistical discrepancies. Since the change in inventories is only associated with enterprises activities, the column which shows the corporation is affected. These are shown in column 24 and rows 1&2&3. In the intersection of row 1 and column 24, the changes in inventories of agricultural product in the year 1996 is about 3,730 billion rials. The total change in inventories is about 5,900 billion rials. The service sector by its nature does not have changes in inventories.

	24
1	3730
2	2233
3	0
Total	5963

### 3.8 (Goods and Services & Capital Formation)

This matrix contains investment by activities on investment goods. As mentioned before, there are three kinds of investment goods: agricultural, industrial, and services. The columns of this matrix have ISIC classification and its rows have CPC classification. The total capital formation by activities is 56,973 billion rials. Agricultural activities have invested 1,300 billion rials in agricultural capital goods, and 1,000 billion rials in industrial goods. Capital formation by agricultural activities is about 2,400 billion rials, by industrial activities about 12,000 billion rials, and by services about 43,000 billion rials.

The total investment in agricultural capital goods is about 1,300 billion rials. In industrial capital goods it is about 54,000 and in services is about 1,000 billion rials.

The share of agriculture in total investment is 4% percent, with the share of industry at 20% and the share of services at 76%. All these figures are gross figures; that is they contain the consumption of capital.

	26	27	28	Total
1	1319	0	0	1319
2	1085	11783	41636	53419
3	10	253	888	1141

As shown in the matrix of capital formation, the industrial activities have 11,783 billion rials investment in the form of industrial capital goods (cell (2,27)) and 253 billion rials in services capital goods. The total of capital formation by industrial activities is equal to 12,035 billion rials. In rows 1&2&3 and column 28, the capital formation of service activities can be seen. The total capital formation by service activities is 42,524 billion rials (cell (33,28)).

The total gross capital formation in 1996 is 56,973 billion rials. The share of capital goods in capital formation is obtained by summing rows 1&2&3. Total investment in agricultural capital goods is 1,319 billion rials (cell

(1,26)),  
rials. Th  
industria

The s  
54% and

The  
activities  
formatio  
sectors h

The sh  
industria

### 3.9 (Gross

The inte  
commod  
world is  
total exp  
We have  
manufac  
includes

1
2
3
Total

### 3.10 (Gross

In the in  
activitie  
remains  
is value

The v  
7 to 13  
billion r  
which fo  
urban ar



(1,26)), and total investment in industrial capital goods is 54,504 billion rials. The share of agricultural capital goods in capital formation is 2%, industrial capital goods is 95% and service capital goods is 3%.

The share of agricultural capital goods in agriculture capital formation is 54% and the share of industrial goods is 45%.

The industrial capital goods share in capital formation in industrial activities is about 98%. The share of agricultural capital goods in capital formation in agriculture is 100%. This means that industrial and service sectors have not used agricultural capital goods in their investment.

The share of industrial capital goods in the agricultural sector is 2%. In the industrial sector it is 20% and in the service sector it is 78%.

**3.9 (Goods and Services & Rest of the World)**

The intersection of rows 1&2&3 and column 24 show the export of commodities. In 1996, the total export of goods and services to the outside world is equal to 49,355 billion rials. The share of agricultural product in total export is about 5% while the share of industrial product is around 95%. We have to keep in mind that the industry here is very broad and contains manufacturing, mining and construction. Therefore, the industrial product includes the oil export which is by its nature a very significant figure.

Export

(percent)

	32
1	2402
2	46911
3	42
Total	49355

	32
1	5
2	95
3	0
Total	100

**3.10 (Generation of Income & Activities)**

In the intersection of generation of income (rows 7 to 13) and columns of activities (columns 4&5& 6), the matrix of value added is shown. Whatever remains from output of activities after paying the cost of intermediate inputs, is value added.

The value added for agricultural sector can be found in column 4 and rows 7 to 13. The total valued added for agricultural sector is equal to 38,239 billion rials. This amount has to be paid to the categories of labor and capital which form rows 7 to 13. These items are: wage earner (private and public, urban and rural), mixed income group, operating surplus, and net taxes. As

shown in the table below, only agricultural activities have negative net taxes which means the subsidies in this category exceed the taxes.

## Value-added

	4	5	6	Total
7	1439	7288	4860	13588
8	376	4610	22800	27786
9	2948	4080	1091	8120
10	465	1329	5941	7735
11	28455	18093	48325	94873
12	7237	60209	49446	116891
13	-2681	1308	499	-874
Total	38239	96916	132963	268118

## (percent)

	4	5	6	
7	4	8	4	4
8	1	5	17	17
9	7	4	1	1
10	1	1	4	4
11	70	19	36	36
12	18	63	37	37
Total	100	100	100	100

## (percent)

	4	5	6	Total
7	10	54	36	100
8	1	17	82	100
9	36	50	14	100
10	6	17	77	100
11	30	19	51	100
12	6	52	42	100

The agricultural sector has paid 1,439 billion rials in 1996 to urban private wage earners. The corresponding figures for rural private wage earners is about 3,000 billion rials. This is almost 4 times bigger than urban private wage earners. Compensations of urban and rural public wage earners by the agricultural sector are almost the same. All in all, the agricultural

sector in 1996 private sector agricultural sector added. The op

The industr wage earners (rials). Mixed public employ 5% of the val and 21% to c sector is about

Private ur compensation compensation billion rials, 7 billion rials re

Rural priva the agricultura the service sec earners from employees cor the service sec with the exce public employ mixed income share of opera service sector,

The total o Product (GDP)

**3.11 (Generat**  
Urban private from the outsid 32.

The compen in 1996 is 52 urban public e of generation i compensation and the urban



net taxes

total
13588
27786
8120
7735
94873
116891
-874
268118

4
17
1
4
36
37
100

total
100
100
100
100
100
100

1996 to urban private wage earners than urban wage earners agricultural

sector in 1996 has paid about 11% of its value added as compensation to the private sector, and about 2% to the public sector. The big figure in the agricultural sector is mixed income, which comprises about 70% of value added. The operating surplus in 1996 is about 18%.

The industrial sector has allocated 8% of its value added to urban private wage earners and 4% to rural private wage earners (7,288 and 4,080 billion rials). Mixed income is about 19% of value added. The compensation of public employees in this sector is about 6%. Service activities have allocated 5% of the value added to the private sector (4% to urban and 1% to rural), and 21% to compensation of public employees. Operating surplus in this sector is about 42% and mixed income is about 32% of value added.

Private urban wage earners have earned about 11% of the total compensation of agricultural activities and 54% of the industrial compensation and finally, 36% of the service sector compensation (1,439 billion rials, 7,288 billion rials, and 4,860 billion rials of the total 13,588 billion rials respectively).

Rural private employees have received 36% of their compensation from the agricultural sector, 50% from the industrial sector, and 14% percent from the service sector. This means that the share of urban and rural private wage earners from the industrial sector is almost the same. Urban public employees compensation is 1% of agriculture, 17% of industry, and 82% of the service sector. The same trend is shown for the rural public employees (with the exception of agriculture). This implies that the urban and rural public employees are mainly employed in the service sectors. The share of mixed income in agriculture is 31%, industry 20% and services 49%. The share of operating surplus in agriculture is 7%, in industry 48%, and in the service sector, it is 45%.

The total of value added, which by definition is the Gross National Product (GDP) of the country in the year 1996, is 268,118 billion rials.

### 3.11 (Generation of Income & Rest of the World)

Urban private and public employees have also received some compensation from the outside world. These figures are shown in rows 7 and 8 and column 32.

The compensation of urban private employees from the rest of the world in 1996 is 527 billion rials (cell (7,32)), and the corresponding figure for urban public employees is 89 billion rials (cell (8,32)). The sum of the rows of generation income is shown in column 33. There we see that employees compensation of the urban private sector is 14,115 billion rials (cell (7,33)), and the urban public employees compensation is 27,875 billion rials. In the

same column we see that rural private employees have received 8,120 billion rials, and rural public employees have received 7,535 billion rials. The total mixed income is 94,873 billion rials, the operating surplus is 116,891 billion rials, and finally the total net taxes is -874 billion rials. These figures are incoming amounts to the generation of income account. Next, we can look at the outgoing of generation of income account.

### 3.12 (Allocation of Primary Income & Generation of Income)

In the intersection of rows 14&15&16 and columns 7 to 13, the allocation matrix is found. In row 14 and column 7, the urban private employees have allocated the generated income which is equal to 14,115 billion rials to the households (cell (14,7)), and foreign employees (cell (32,7)). The foreign employees compensation is equal to 471 billion rials, and whatever remains is allocated to the domestic households (cell (14,7)). In the same manner, urban public employees have allocated the generated income to households and foreign public employees. This means that, from the total income of 27,757 billion rials of public employees, an amount equal to 528 billion rials has been allocated to public foreign employees and the rest to the households (cell (14,8)).

As can be seen from the allocation matrix, the total compensation of urban, rural, private, and public employees has been allocated to households.

Gross mixed income is equal to 94,873 billion rials (cell (11,13)) which is allocated to households. Almost 17% of operation surplus has been allocated to households and 83% to corporations (cells (14,12), (15,12)). The taxes are allocated totally to the government. 62% of GDP has been allocated to households and the rest to corporations.

### 3.13 (Allocation of Primary Income & Allocation of Primary Income)

We have already discussed the Allocation of Primary Income. Here we discuss the other entries in this account. In the intersection of rows 14&15&16 and columns 14&15&16, that is, in the diagonal matrix of Table 1, the matrix of transfer between institutions can be found. This matrix contains direct taxes such as income tax and property tax. Therefore, the figures in this matrix have no effect on the overall balance of Table 1, and usually are not reported in the National Income Account.

The total transfers between institutions is 65,456 billion rials. Almost all of the households transfer has been allocated to the corporations. The nature of these transfers could be interest payment or rent or things of this kind. The largest number belongs to the corporation which is about 60,000 billion rials. About 31% of these transfers is allocated to the households, 22% to

corpora  
be thou  
One ex  
operati  
househ  
column  
discuss  
billion

In ro  
comper  
househ  
income  
28,878

The  
(tariffs)

### 3.14 (Income)

In the  
related  
178,19  
billion  
which  
17&18  
seen. I  
from h  
from th  
180,78  
(17,18  
rials (  
domes  
855 bi  
from  
consid

### 3.15 (Income)

The m  
17&18  
(cell (  
from



120 billion  
s. The total  
891 billion  
figures are  
we can look

the allocation  
employees have  
rials to the  
The foreign  
ver remains  
ne manner,  
households  
income of  
billion rials  
households

ensation of  
households.  
3)) which is  
en allocated  
The taxes  
allocated to

#### Income)

e. Here we  
n of rows  
rix of Table  
This matrix  
erefore, the  
Table 1, and

Almost all  
The nature  
is kind. The  
billion rials.  
ds, 22% to

corporations and 47% to the government. These later kinds of transfers can be thought of as the payment by the public corporation to the government. One example is the National Oil Company which manages the sale and operation of oil in the country on behalf of the government. The income of households from transfers is 18,608 billion rials (the sum of row 14 and columns 14&15&16), which is added to the generated income previously discussed. The income of corporation from transfers is equal to 18,916 billion rials and that of the government is 27,940 billion rials.

In row 14 and column 33, the income of households from employees compensation, mixed income, operating surplus and transfer is shown. The household income is 178,191 billion rials. The corporation and government income are shown in rows 15 and 16 and column 33, which are 126,936 and 28,878 billion rials respectively.

The government has another source of income as it taxes the imports (tariffs). These items are shown in row 16 and columns 1&2&3.

### 3.14 (Secondary Distribution of Income & Allocation of Primary Income)

In the intersection of rows 17&18&19 and columns 14&15&16, the figures related to the national income are shown. The households which have had 178,191 billion rials income, pay 4,928 billion rials to corporations and 23 billion rials to the government. What remains is equal to 173,240 billion rials which constitutes the households national income (cell (17,14)). In rows 17&18&19 and columns 17&18&19, the matrix of transfer payments can be seen. In the first row of this matrix, households receive 1,978 billion rials from households, 557 billion rials from corporations, and 5,013 billion rials from the government. Therefore, the total amount that households receive is 180,787 (cell (17,33)). Corporations transfer payments are shown in cells (17,18), (18,18), and (18,19). The corporation income is now 71,468 billion rials (cell (18,33)). The government receives transfer payments from domestic institutions and also from the rest of the world, the later equaling 855 billion rials (cell (19,32)). The nature of this payment could be the profit from investment outside of the country. The government income, considering all of these figures, is 35,961 billion rials (cell (19,33)).

### 3.15 (Consumption of Income & Secondary Distribution of Income)

The matrix of disposable income is located at rows 20&21&22 and columns 17&18&19. The disposable income of households is 170,139 billion rials (cell (20,17)). Whatever is left after the payment of taxes and other transfers from the households income constitute the disposable income of the

households. As an example, the income of households in row 17 and column 14 is 173,240 billion rials, of which the households pay 1,978 billion rials (cell (17,17)) to households, 696 billion rials (cell (18,17)) to corporations, and 7,976 billion rials (cell (19,17)) to the government. Therefore, we have:

$$173,240 - (1,978 + 696 + 7,976) = 170,139$$

which is the households disposable income. The corporations and government disposable incomes are calculated in the same manner and are 70,083 billion rials (cell (21,18)) and 28,171 billion rials (cell (22,19)) respectively.

### 3.16 (Goods and Services & Consumption of Income)

The consumptions of institutions are shown in the rows 1&2&3 and columns 20&21&22. Here the consumptions of goods and services by the institutions are registered.

The households in 1996 have consumed 29,077 billion rials of agricultural products (cell (1,20)), 73,051 billion rials of industrial products (cell (2,20)), and 50,842 billion rials of services products (cell (3,20)). The total consumption by the households is 152,970 billion rials. The total consumption by the government is 33,561 billion rials (the sum of cells (2,22), and (3,22)).

Based on the figures in the Table 1, the households account has consumed the three kinds of goods, while the government consumption is 99 percent of the service kind. Whatever is left of the households disposable income after payment for consumer products is the savings of the households which is registered in the saving matrix.

### 3.17 (Capital & Consumption of Income)

In the intersection of rows 23&24&25 and columns 20&21&22, the matrix of saving is found. Whatever is left of disposable income after the payment for consumption is saving. This is calculated as residual. Therefore, the saving is:

$$\text{Saving} = \text{disposable income} - \text{consumptions}$$

For the households:

$$\text{Saving of the households} = 170,139 - 152,970 = 17,169$$

In the  
is calcula

In row  
equal to  
rials an  
governm  
governm

All th  
entries in  
Therefor

### 3.18 (Ca

In the i  
account,  
and colu  
have inv

institutio  
In ro  
1996 is  
invest in  
investme  
percent.

In row  
is show  
househo  
share of

Capita  
investme  
investme  
rials. TH  
share of

Total

(26,33),  
The s  
the indu  
76%.



In the same manner, the residual saving for corporations and government is calculated.

In row 23 and column 20 the saving of households is registered, which is equal to 17,169 billion rials. The saving of corporations is 69,406 billion rials and of the government -5,390 billion rials (cell (25,22)). The government saving is negative which means that the consumption by the government exceeded the disposable income of the government.

All the figures in the saving matrix are gross figures. The sum of all entries in the saving matrix show the aggregate gross saving of the country. Therefore, the total gross saving is 81,179 billion rials.

### 3.18 (Capital Formation & Capital)

In the intersection of the capital account and the formation of capital account, capital formation by the institutions is shown (rows 26&27&28 and columns 23&24&25). The entries in this matrix show how institutions have invested in activities. In other words, it shows how the savings of institutions have been used and to what purpose.

In row 26 we see that the total investment in agricultural activities in 1996 is 2,414 billion rials (cell (33,26)). In this year, the government did not invest in agricultural activities. The share of households in total agricultural investment is about 65 percent and that of the corporations is about 35 percent.

In row 27 and column 33, total capital formation for the industrial sector is shown to be 12,035 billion rials. Of this total, 1,152 billion rials is household investment, 10,883 billion rials is corporate investment. The share of households is 10, and the share of corporations is 90%.

Capital formation in the service sector is 42,524 billion rials. Households investment in the service sector is 13561 billion rials, government investment is 12453 billion rials and corporate investment is 16510 billion rials. The share of households in total investment in this sector is 31%, the share of government is 29% and the share of corporations is 40%.

Total gross investment in 1996 is 56,973 billion rials. (The sum of cells (26,33), (27,33), (28,33).)

The share of agricultural activities in total investment is 4%, the share of the industrial and mining group is 20% and the share of the service sector is 76%.

### 3.19 (Financial & Capital)

In the intersection of row 29&30&31 and columns 23&24&25 the matrix of lending is found. The unit of this account is asset, which shows the changes (increase or decrease) in financial assets of institutions.

There is another related matrix in the intersection of capital account and financial account (rows 23&24&25 and columns 29&30&31). This matrix records the borrowing by the institution. This matrix shows the changes (increase or decrease) in liabilities of the institutions in the economy.

The total resources available to the economy is equal to the sum of saving and borrowing. The institutions in the economy use these resources to acquire assets or to make investments.

In row 23 and column 33, the total resources of households in 1996 is shown which is equal to 24,250 billion rials. Of this figure, 17,169 billion rials originates from saving and the rest from borrowing (liabilities) by households. In 1996, the households have incurred 3 billion rials of liabilities (increase in liabilities) in the form of money, and 6,767 billion rials in the form of loans as well as 312 billion rials in other kinds of assets. The total increase in households liabilities is 7,082 billion rials which, if added to the households savings, results in 24,250 billion rials. This is the total resources available to households in the same year.

The households have used these resources for investment and to acquire some kinds of financial assets. As is shown, the households have used 17,120 billion rials of these resources for investment (cell (26,23), ((27,23), (28,23)). The increase in the financial assets of the households are shown in the rows 29&30&31 and column 23. As is clear from the lending matrix, the increase in financial assets of the households in terms of money is equal to 4,124 billion rials. Other forms of assets equal 3,000 billion rials. Households do not acquire assets in terms of loans. (Either loans are not given out or this kind of activity is not recorded.) Therefore, the increase in financial assets of households in terms of loans is zero.

Total resources available to corporations in the year 1996 is equal to 115,449 billion rials, of which 69,400 billion rials comes from saving and 46,049 billion rials comes from borrowing. These resources have been put to use in column 24. The uses are changes in inventory (5,963 billion rials), capital formation (27,393 billion rials) and the acquisition of financial assets (82,092 billion rials).

Based on Table 2, the changes in financial assets of households in 1996 are 7,124 billion rials and the changes in their liabilities are 7,082 billion rials. The difference between these two items is 9,642 billion rials. This



means that households in 1996 have had net lending equal to 42 billion rials which shows a positive net balance.

The changes in financial assets of corporations are equal to 82,092 billion rials and the changes in their financial liabilities are 46,049 billion rials. This net change shows a positive balance of 36,043 billion rials.

The government net change is negative, which means that the change in assets was smaller than the change in liabilities.

The domestic economy in 1996 has changes in assets equal to 103,668 billion rials, and changes in liabilities equal to 85,426 billion rials. This means that the net lending of the economy is positive and is equal to 18,242 billion rials. This amount has been lent to the rest of the world which results in net changes in liabilities equal to -18,242 billion rials. The economy as whole has a zero balance.

#### **4. Summary and Conclusion**

In this article the Social Accounting Matrix in aggregate form was briefly introduced to show its compatibility with the national income account.

The matrix introduces three commodities, three institutions, seven categories of factors of production, and three kinds of assets. The sub matrices of Make and Use formed the corner stone of the matrix. The allocation of income among institutions and the uses of that income are presented in a systematic manner. The Flow of Fund Table and the way it is related to the real economy was presented. The matrix also includes the who, what and where of investment. That is; who invested in activities and how were these activities invested in capital goods. Direct taxes and other transfers were discussed. Finally, the matrix shows how the domestic economy interacts with the outside world.

The national income account does not have enough flexibility in dealing with socio-economic groups, especially with regard to the analysis of households income and expenditure. The Social Accounting Matrix provides a consistent framework for analysis of a wide variety of problems. The SAM presented in this article is shown to be comprehensive enough to tackle a broader set of problems and, at the same time, is small enough to be cost effective.

### References

1. Stone, R. (1986). "Social Accounting: The State of Play" *Scandinavian Journal of Economics*, Vol. 88, No. 3
2. Pyatt, G. and Round, I.J. (1978). "Social Accounting and Development Planning" Working paper, No. 654, World Bank, Washington, D.C.
3. Keuning, S. (1988). "Interaction between National Account and Socio-Economic Policy" *The Review of Income and Wealth*, Vol. 44, No. 3
4. De Haan, M. and Keuning, S. (1996). "Taking the Environment into Account :The NAMEA Approach" *The Review of Income and Wealth*. Vol. 42, No. 2.
5. Ruggles, R. and Ruggles, N. (1986). "The Integration of Macro and Micro Data for the Household Sectors" *The Review of Income and Wealth*. Vol. 32, No. 3.  
Ruggles, R. (1996) The United Nations System of National Accounts and the Integration of Micro and Macro Data J. W. Kendrick (ed) The New System of National Account Kluwer Academic Publishers, Boston.
6. In this case, Keuning in his book "Accounting for Development and Social Change" argues that the main problem in many countries is not lack of data. According to him, the official data published in these countries contain a wealth of information. The main problem he sees is the lack of consistency and logical connection between these data. To extend the system of national account to social and environment problems, a coherent set of data is required. For more information see the foreword in:  
Keuning, S. (1996). "Accounting for Economic Development and Social Change" IOS Press, Amsterdam
7. United Nations, Eurostat, International Monetary Fund, Organization for Economic Development and Cooperation, and world Bank (1993) System of National Accounts 1993, United Nation, New York, Chap. XX.
8. For example, the capital account has been disaggregated into two accounts, capital formation and financial account. The later account needs a new unit to be fully implemented in the SAM. This unit is Asset, which has been used in the financial account. A SAM with flow of fund account for the first/ time has been constructed for the Iranian economy. For more information, see the following reference.
9. Research Center for Iranian Economy: The final result of matrix of social account for Iran 1375, Tehran Iran
10. Here by industry we mean a group of activities including manufacturing, mining, construction, electricity, gas and water.



andinavian  
development  
and Socio-  
ment into  
ealth. Vol.  
and Micro  
th. Vol. 32,  
accounts and  
The New  
ment and  
is not lack  
e countries  
the lack of  
the system  
erent set of  
and Social  
nization for  
System of  
d into two  
unt needs a  
, which has  
ount for the  
For more  
rix of social  
nufacturing,

11. Also, the names seem similar but note that they can mean totally different things. For example, agricultural activities can produce agricultural commodities or other commodities.
12. In referring to matrices, we put the row as the first argument and the column as the second.