SOCIAL ACCOUNTING MATRICES FOR RUSSIA FOR 1995-2001

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Abstract

The paper presents detailed notes on data sources, assumption and procedures of compiling the social accounting matrices for the Russian economy. Statistical data for compiling SAM relies exclusively on official sources for the latest economic data including Russian input-output tables and nationally representative household survey for 2000 and 2001.

Compiled SAM used for exploration of income generation, distribution, redistribution and use by institutional sectors in the Russian economy. Analysis was carried out on SAM basis represented a macro economic framework with three institutions: households, corporate enterprises and government.

Tax burden on institutional sectors income was estimated on SAM basis, alternative estimation of tax burden was implemented also. Multipliers of the SAM circular flow model are analyzed to show impact of exogenous factors and changing in proportion of income distribution on the growth rate of the Russian economy.

Key words: Income distribution, institutional sectors, social accounting matrix, tax burden, factors of economic growth, Russia.

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INTRODUCTION

Income distribution among the basic economic agents: state, households, and enterprises recently discussed in the Russian literature very actively. Discussion is mainly political and has a lot of issues: results of privatization and income redistribution for the benefit of new owners of former public property, in the same course – distribution of gains from national natural resources for the benefit of the monopolists got access to them; lower, than in other countries a share of compensation of employees in value added, an impoverishment of population and income redistribution for the benefit of small group of the richest part of population, etc. Besides political, social, ethical aspects of investigation of up-to-date income distribution and redistribution in the Russian economy there is not less important economic issue: how does income distribution change and whether shifts in income distribution have an impact on results of economic activity, in particular, economic growth.

Economic substance of mentioned issues consists in investigation of economy-wide circular flow and interrelations of institutional sectors of national economy (households, enterprises, state) at various stages: primary income generation, income distribution and redistribution and final use.

Social accounting matrix (SAM) is the widespread framework for analysis of income distribution and redistribution in socio-economic system. A social accounting matrix is a particular representation of the economic accounts of a socio-economic system, which captures the transactions and transfers between all economic agents in the system. General approach to compilation of social accounting matrices is offered in the system of national accounting (SNA) [System..., 1998], it is based on matrix representation of a full system of accounts or their specific set with a various degree of disaggregating. The basic framework of the matrix is flexible so that any set of macroeconomic aggregates can be submitted in a matrix form.

The paper presents detailed notes on data sources, assumptions and procedures of compiling the social accounting matrices for the Russian economy. Estimated matrices were used for exploration of income generation, distribution, redistribution and use by institutional sectors in the Russian economy in 1995-2001.

The paper includes 2 parts: detail description of procedure of compiling aggregated and disaggregated SAM, and results of economic analysis on SAM base, dealing with income generation, distribution, redistribution and use by institutional sectors.

We have compiled aggregated SAM for the Russian economy for 1995-2001 and a disaggregated SAM for 2000 in general form, suitable for various types of economic analysis.

The aggregated tables represent a macroeconomic framework of an economy with three institutions: households, corporate enterprises and the government. Data sources for compiling the aggregated SAM include matrix presentation of the national accounts published by Goskomstat of the Russian Federation. The disaggregated SAM includes information of the Russian input-output tables for 2000 and the national representative households survey for 2000.

The analysis of income distribution is carried out on SAM basis. Compiled SAM used for estimation of tax burden on institutional sectors income, alternative estimation of tax burden was implemented also. Multipliers of the SAM circular flow model are analyzed to show impact of exogenous factors and changing in proportion of income distribution on the growth of the Russian economy.

SAM COMPILATION

There are a lot of different approaches to SAM compilation submitted in the literature. Publications on the given subject can be divided into two groups.

The first one includes the papers in which SAM is compiled as a statistical data base for further economic analysis including modeling. Problems of SAM compilation in this respect are similar to compiling input-output tables. However, unlike input-output tables the form of which is strictly determined by SNA and is maintained when tables for different countries are developed there is not rigid framework for SAM presentation. Therefore the form of a SAM may vary in different countries for which matrices are compiled, as a rule, by the research institutions. General framework for social accounting matrix is based on R. Stone approach [Stone, 1970]. The circular flows represented in a SAM capture generation of income by activities in producing commodities, mapping of these income payments to factors of production of various kinds, distribution of factor and non-factor income to households, and subsequent spending of income by households on commodities. This approach provides the framework for different types of macroeconomic analysis. The general approach for SAM compilation used for different purposes of macroeconomic analysis is submitted in [Applied Methods, 1997]. Series of papers representing disaggregated SAM compiled as database for macroeconomic analysis including the general equilibrium modeling used this approach [A Social Accounting Matrix, 2002].

The second group of papers presented SAM compiled for the purposes of specific research. Sets of accounts and the level of institutions, products and activities disaggregation mapped in such SAM differ depending on the purposes of research, and only the matrix form of representation of transactions remains common for all of them. SAM is used in these cases as a technique for research of income distribution and redistribution and urban growth [Cohen, 1996; Cohen, 1999], analysis of financial flows [Belousov, Abramova, 1999]. Framework of these matrices and transactions included depends on specific research purposes, and not necessarily provides interrelated set of all basic macroeconomic aggregates. Experience of development of matrices is interesting from the point of view of presentation of specific transactions and consolidation of statistical data from different sources

The system of national accounts developed by Goskomstat RF for Russia gives ample opportunities for compiling a SAM in aggregated and disaggregated forms.

Matrix representation of the national accounts developed by Goskomstat RF since 1995 for three institutional sectors: government, households, enterprises and NPISH (non-profit institutions serving households) [Natsional'nye..., 2003, pp. 24-31] provides statistical data base for compiling an aggregated SAM in SNA standard. Goskomstat's data includes all the accounts submitted in the matrix representation: goods and services account,

production account,
generation of income account,
allocation of primary income account,
secondary distribution of income account,
use of disposable income account,
capital account,
the rest of the world account.

We intended to include in the SAM the transactions of three specified institutional sectors, submitted in the listed above accounts. The available data allows to compile an aggregated SAM with 8 rows and 8 columns representing with a different degree of aggregation all accounts and institutional sectors included by Goskomstat RF in its "matrix presentation of accounts":

Activities (the production account),
Commodities (the goods and services account),
Factors (the generation of income account),
Institutional sectors (enterprises, households, the government, which transaction are displayed in the accounts of generation, distribution, redistribution and use of disposable income),
Saving -investment (the capital account),

Transactions with the rest of the world.

Table 1 depicts a MacroSAM in terms of the standard macro accounting identities, based on SAM framework offered in [Applied…, 1997, p.100] modified to use the available for the RF data. Corresponding rows and columns shares the same label. Values (in billions of roubles) are assigned to all the cells for which a transaction between two accounts takes place. The relevant cell in table 1 is referred to as (i,j) where i refers to rows and j to columns.

Unlike the SNA approach where rows and columns totals in SAM have no economic sense, and the basic macroeconomic aggregates are recorded as balancing items on diagonal of a matrix, macroeconomic aggregates in the offered version of SAM are recorded in rows and columns totals. Equality of totals by rows to corresponding columns totals ensure balancing of incomings and outgoings for every account included in the SAM irrespective of whether they describe goods and services accounts or income and expenditures of institutional sectors:

(9,1) total costs = (1,9) total sales;

(9,2) total supply = (2,9) total demand;

(9,3) total factors payments = (3,9) total factors income;

(9,4) total enterprises expenditures = (4,9) total enterprises income;

(9,5) total households expenditures = (5,9) total households income;

(9,6) total government expenditures = (6,9) total government income;

(9,7) gross fixed capital formation = (7,9) total savings;

(9,8) total income of the rest of the world = (8,9) total expenditures in the account of the rest of the world.

Detail description of economic transactions for every cell is presented in the ANNEX 1. Aggregated SAM for the Russian economy for 1995-2001 are presented in the ANNEX2 (Tables A1-A7).

To allow more detailed analysis the Macro SAM for 2000 was disaggregated into matrix with dimension 64x64. On the production side the disaggregated SAM covers 24 activities and 24 commodities. There are also 2 production factors (labor and capital) and 10 households types, one enterprises sector, one state account, an investment/savings account and an account for the rest of the world.

Primary data sources for the disaggregated SAM inlcude the 2000 input-output tables for the Russian Federation and the 2000 households sample survey. Activities and commodities classification corresponds to the classification used in the supply table and the use table in the Russian input-output tables for 2000. The households account is disaggregated in 10 dimensions and includes 10 income types (or categories) of households (deciles).

The aggregated matrix is used as a basis for disaggregation of the households account, relying on the households survey in respect of the data on the commodities shares of expenditures for final consumption and the households types income. In the case of using primary detailed data (input-output tables) as a basis for the disaggregated SAM incomings and outgoings in the aggregated SAM are used for the control of data consistency.

The macroeconomic aggregates published by Goskomstat RF in the input-output tables for 2000 [Sistema…, 2003], do not reconcile with the data of the national accounts for the same year, published later in the system of the national accounts [Natsional'nye..., 2003].

As the data of the input-output tables are considered to be more accurate in comparison with other sources we have compiled the aggregated matrix in the form represented in the Table 1, using the data from the input-output tables as the entries for activities, commodities, factors and the rest of the world accounts.

Discrepancies for most of the macroeconomic aggregates in SNA and input-output table are insignificant and do not exceed 1-3 percent. Essential discrepancies appear in the estimation of compensations of employees, gross profits, and gross mixed income. In comparison with the national accounts the compensations of employees in the input-output tables is underestimated for more than a quarter, the gross profits (operational surplus), on the contrary, is overestimated. The difference is caused by the different ways of including of hidden compensations of employees.

Table 1. Aggregated SAM including institutional sectors

		1	2	3	4	5	6	7	8	9
		Activities	Commodities	Factors	Enterprises	Households	Government	Capital	The rest of the world	Total
1	Activities		Output							Total sales
2	Commodities	Intermediate consumption				Household expenditures for final consumption	Government expenditures for final consumption	Gross capital formation	Export	Total demand
3	Factors	Value added							Compensation of employees received from abroad	Factor income
4	Enterprises			Gross profit			Transfers from government to enterprises			Income of enterprises
5	Households			Compensation of employees	Transfers from enterprises to households		Transfers from government to households			Households income
6	Government	Other taxes on production	Taxes on products	Factor income of government	Current taxes on property and income of enterprises	Households income taxes			Property income, income taxes and transfers received from the rest of the world	Government income
7	Capital				Enterprises savings	Households savings	Government savings		Capital transfers receivable (+)/ payable (-)	Total savings
8	The rest of the world		Import	Compensation of employees transferred to abroad			Property income, income taxes and transfers to rest of the world	net lending (+)/ net borrowing (-) of economy as a whole		
9	Total	Total costs	Total supply	Total factor expenditures	Total enterprises expenditures	Total households expenditures	Total government expenditures	Total gross capital formation		

In the generation of income account by industries the hidden compensations of employees was attributed to compensations of employees, but not distributed among the industries. In the input-output tables hidden wages are attributed to gross profits.

The relevant information for disaggregation of the households account is available in the Russian sample households survey for 2000 [Dohody…, 2001]. The survey is based on a nationally representative sample of 49175 households. We use standard classification of 10-percent (decile) groups of households according per capita disposable income.

The data of households surveys is traditionally used in SAM as share parameters for disaggregating the macroeconomic indicators of households consumption and households income. The splitting of households account into 10 households categories is used to derive the submatrix of private consumption (24x10), and transaction submatrices "households – labor", "households – enterprises", and "households – government".

To complete the SAM estimation procedure, it was necessary to reconcile the data sources mentioned above into a consistent set of tabular accounts.

Standard approach for SAM compiling is to start with a consistent SAM for a particular period and then update it for the later periods. This approach is used when there is available information on rows and columns totals, while there is no information on the flows within the SAM. The traditional RAS approach addresses this case. However, in practice, one often starts from an inconsistent SAM, with incomplete information on both rows and columns totals and flows within the SAM. [Robinson, Cattaneo and El-Said…, 2000].

The "cross entropy" (CE) approach is developed for estimating a consistent SAM from inconsistent data with errors [Robinson, Cattaneo and El-Said, 2000, Robinson and El-Said, 2000]. The method represents a considerable extension and generalization of the standard RAS method and allows a wide range of prior information to be used effectively for estimation.

The disaggregated SAM is also inconsistent, discrepancies of rows and columns sums take place in the accounts of labor, enterprises, households categories, government and the rest of the world. Discrepancies are greatest for the accounts of specific households types, where they make up to 6 % from total income.

The following substantial assumptions are made at balancing rows and columns sums in the disaggregated SAM. The data from the households survey concerning distribution of households income and savings among the households categories is less reliable then the data of the input-output tables and the national accounts. Using of CE technique for balancing of the aggregated SAM shows that the adjustments are also essential for the account of the rest of the world.

Thus we use estimated data on savings of households types calculated as the difference of households disposable monetary income, consumer expenditures and transfers to government. This allows to balance the accounts of households categories. To balance the accounts of labor, government and capital, where the value of discrepancies makes up to 1-2% of total sum we adjust the account of the rest of the world.

The presented SAM is a comprehensive and consistent data system that captures the interdependence that existed within the socioeconomic system of the Russian Federation. The SAM provides useful information about such key issues as intersectoral linkages, determination of income distribution by socioeconomic groups.

The SAM can be used as a conceptual framework to explore the impact of exogenous changes such as a variety of shocks, policy changes and reforms on the whole interdependent socioeconomic system. As such, the SAM becomes the basis for simple multiplier analysis.

STRUCTURE OF INCOME OF INSTITUTIONAL SECTORS

Institutional sectors of economy are singled out according to their functions carried out in circular flows of income. Households gain the incomes due to factor income – compensation of employees and mixed income, and also transfers received from enterprises and governmental organizations. They spend disposable income for consumption, forming a part of final demand of

economy, and also for savings. Primary income of enterprises includes factor income (capital income) and transfers from governmental sector. Enterprises redistribute a part of their incomes as transfers to government and households and direct another part of disposable income at capital accumulation. Sector of governmental organizations gains factor income, tax transfers from enterprises and households, taxes on products and import, and spends disposable income on transfers to sectors of enterprises and households, governmental final consumption and savings. In open economy all institutional sectors carry out transaction with the rest of the world, reflected as incomes received by the sector from the other countries, and transfer a part of sector income to the rest of the world.

Income redistribution among the institutional sectors is carried out through the mechanism of redistribution including tax system developed in economy, social insurance, and state expenditure. Disposable income of institutions resulted from redistribution are used for final consumption and savings. Proportion of disposable income distribution among the institutional sectors and subsequent redistribution to final consumption forms a final demand of economy and savings, and determines a set of macroeconomic proportions, including economic growth rates.

A share of institutional sector in generated primary income depends on distribution of used factors of production (labor and capital), and distribution of generated income among the factors, that is defined by structure of property on production factors.

Interrelations of institutional sectors are reflected in system of national accounts. Economic units in the SNA are classified by institutional sectors. In the Russian SNA the following sectors of national economy are determined: non-financial enterprises; financial institutions; general government; non-profit institutions serving households (NPISH); households. At present Goskomstat of Russia compiles accounts for three sectors of the domestic economy: households, non-profit institutions serving households, the general government, as well as accounts for the rest of the world. Besides the standard sectors, data are obtained by a residual method for a notional sector “enterprises and non-profit institutions” covering three sectors: non-financial enterprises, financial institutions, and non-profit institutions serving households. So available statistical data allows carry out analysis for three institutional sectors: “enterprises and non-profit institutions”, “households” and “general government”.

Primary incomes of institutional sectors include the incomes received from production or possession of the assets used for production. Primary incomes refers to the income receivable by institutional units from value added generated in production (compensation of employees including according the SNA contributions of employers to insurance funds and mixed income for households and gross profit for enterprises). Primary income of general government[3] consists of the tax on production and import. Property incomes also relate to primary incomes of institutional sectors.

Households generate more than half of primary incomes in the Russian economy (Table 2). A share of households in primary incomes reached almost 2/3 in 1995-1998 under conditions of economic recession. Parity between the primary incomes of institutional sectors was relatively stable. Financial crisis in 1998 has led to sharp reduction of real wage (real wages index has made in 1999 78 % from a level of the last year) that resulted in decrease in a share of household primary income on 7 points. The growth in the Russian economy, begun in 1999, was accompanied by rapid increase of incomes of enterprises and government. Compensation of employees increased slowly in comparison with other components of value added, as a result a share of households in generated primary income decreased. In 2001 she has made only 55.4 % of total primary incomes.

The most essential changing in the structure of household income was observed in 1999 that has been caused by a default of 1998 when due to reduction of wages and salaries a share of other elements in household primary incomes has increased. However further growth of household primary income occurred in particular for the account of growth of wages and salaries.

[3] Later we use “general government”, “government” as synonym as well as “governmental sector”.

Table 2. Structure of primary and disposable incomes in 1995-2001 (%)

	Government		Households		Enterprises and NPISH		Total	
	primary	disposable	primary	disposable	primary	disposable	primary	disposable
1995	14.5	25.2	61.2	58.8	24.3	16.0	100.0	100.0
1996	16.2	23.8	65.4	62.5	18.4	13.7	100.0	100.0
1997	14.0	23.4	65.,8	61.4	20.2	15.2	100.0	100.0
1998	12.3	20.1	64.5	60.7	23.2	19.2	100.0	100.0
1999	14.0	26.1	57.5	53.5	28.4	20.4	100.0	100.0
2000	16.5	26.8	53.7	49.2	29.8	24.0	100.0	100.0
2001	15.8	23.9	55.4	51.9	28.8	24.2	100.0	100.0

Source: calculated on [National..., 2003, pp. 82-105; Natsional'nye..., 2003, pp. 24-31].

The shares of enterprises and government in total primary incomes have increased during period of economic growth, as in comparison with 1995, and especially in comparison with 1998 previous to the beginning of economic growth.

Growth of a share of enterprises sector income occurred mainly due to the gross profit appeared as the most essential change in structure of primary incomes. In 1998 as a result of reduction of compensation of employees an enterprise share in total cost gross profit has increased, the advantage of relatively decreasing wage and salaries the enterprises used further. Growth rate of gross profit exceeded the growth rate of compensation of employees in 1999 in 1.17 times, in 2000 in 1.13 times, therefore a share of the enterprises in primary incomes has increased in 2001 in comparison with 1998 by 5.6 points. As a result a share of gross profit in primary enterprises income increased, and a share of property incomes decreased.

A share of government also increased, especially appreciable extension appeared in 2001 in comparison with 1998 – from 12.3 % up to 15.5 % accordingly. Growth of government income has been caused mainly by increase of tax revenues.

Reduction of household weight in primary incomes was accompanied by change of their structure in direction of increase of a share of compensation of employees in total income and a share of wages and salaries in compensation of employees (Table 3).

Table 3. Structure of institutional sectors primary income in 1995-2001(%)

Institutional sectors	1995	1996	1997	1998	1999	2000	2001
Government							
Taxes less subsidies on products	47.0	46.1	45.3	46.5	53.3	56.5	65.0
Other taxes less subsidies on production	24.2	27.3	30.1	34.2	29.0	28.1	17.9
Gross profit	19.5	18.2	16.5	11.1	4.1	3.2	4.1
Property income receivable	9.3	8.4	8.1	8.1	13.6	12.1	12.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Households							
Gross mixed income	20.7	18.3	18.4	19.9	20.7	18.1	17.5
Compensation of employees	76.1	76.5	77.1	76.1	73.4	76.4	78.2
Including:							
Wages and salaries	61.7	60.2	60.3	59.0	58.2	59.8	63.5
Actual social contributions	13.1	14.8	15.3	15.2	13.2	15.0	13.0
Imputed social contributions	1.5	1.7	1.7	2.0	1.8	1.5	1.5
Balance of wages and salaries receivable abroad and payable to non-residents	-0.2	-0.1	-0.1	0.0	0.2	0,2	0.1

Property income receivable	3.3	5.3	4.5	4.2	6.1	5,7	4.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Enterprises							
Gross profit[4]	100.0	100.0	100,0	83.3	89.8	90.6	88.5
Property income receivable				16.7	10.2	9.4	11.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: calculated on [National..., 2003, p. 106; Natsional'nye..., 2003, p. 36].

Actually, average growth of employed in 1999-2001 in the Russian economy has made about 300 thousand persons. Increase of nominal wages and salaries has made in 1999 44.8% of the previous year, in 2000 – 46.0%, in 2001 – 47.8%, the growth of real wages and salaries consisted accordingly 21% in 2000 and 20% in 2001 [Rossiiskii…, 2002, p. 171]. A share of the others elements in household income either did not change, or was reduced, the shares of gross mixed income and property incomes have most noticeably decreased. However the increase of wages and salaries as it was marked already, was less intensive, than growth of enterprises and government incomes therefore a share of households in primary incomes was reduced.

Essential changes took place in structure of government primary incomes in 1999-2001 resulted from changing in structure of tax and non-tax incomes of the government. Shifts aside the increase of a share of taxes on products and decrease of a share of other taxes on production occurred in structure of tax incomes, reduction of a share of gross profit of state enterprises and increase of a share of property incomes was marked for non-tax income.

Disposable income of institutional sectors appeared as a result of primary distribution as well as income redistribution in monetary form. The distribution of disposable income among the institutional sectors is submitted in table 2.

In 2001 a share of government has made 23.9 % of disposable incomes, households – 51.9 %, enterprises and NPISH – 24.2 %. Redistribution of incomes from sectors of households and enterprises to governmental sector is the resulting tendency of the circular flows in the economy.

Tendencies of incomes redistribution appeared in household sector and enterprises sector are various. A share of households sector reduced both in primary, and in disposable incomes during the considered period, i.e. the income flow from households to the government increased, therefore a share of households in disposable incomes was reduced more intensively, than in a primary income. Sector of enterprises also redistributes a part of generated incomes for the benefit of government, so a share of enterprises income in total primary incomes is lower, than in total disposable incomes. But a share of enterprises in total primary and total disposable incomes increases in dynamics.

Structure of income flows circulated between the institutional sectors was submitted in detail in social accounting matrix. Disposable income of households refers to the total income received by households as a result of primary distribution (compensation of employees, mixed income, property income) as well as result of redistribution of incomes (receivable transfers from enterprises and government and payable transfers from households to government).

The structure of disposable household incomes appears relatively stable during the all considered period (table 4). At the account of incomes received by households through income redistribution the remarkable decrease of a share of factor incomes (compensation of employees and mixed income) in 1998 was not observed. A small increase of a share of factor incomes took place in 1999-2001. The parity between the shares of transfers received from enterprises and from government in household incomes has changed. A share of transfers received by households from

[4] Data on property income of enterprises is not available from the allocation of primary income account in 1995-1998.

government during 1999-2001 was on the average lower, than in 1997-1998 whereas a share of transfers from enterprises has a little risen.

Table 4. Structure of institutional sectors disposable income in 1995-2001(%)

Institutional sectors	1995	1996	1997	1998	1999	2000	2001
Households							
Factor income	81.4	81.0	82.3	81.8	82.4	82.9	82.5
Transfers from enterprises	6.0	5.1	1.8	4.3	5.9	5.4	4.4
Transfers from government	12.6	13.9	15.9	13.9	11.7	11.7	13.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Enterprises							
Factor income	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Government							
Taxes on products	20.2	21.9	20.9	22.9	26.0	29.1	32.8
Factor income	18.7	21.6	21.6	22.4	16.2	16.2	11.1
Transfers from enterprises	27.4	17.7	19.2	13.7	22.8	19.4	19.1
Transfers from households	30.0	35.8	35.8	37.9	29.1	30.2	31.3
Transfers from rest of the world	3.6	3.0	2.5	3.0	6.0	5.2	5.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: calculated on base of SAM.

Changes in structure of household income can be marked as amplification of market tendencies, i.e. increase of a share of factor incomes generated on the basis of wages and salaries and easing of "social support from the state" weight which was reflected in reduction of a share government transfers in household income. A share of transfers from enterprises to households, which includes transfer of property income and social transfers of enterprises to their employees in 1999-2001, was reduced.

Enterprises income consists of factor incomes refer to the gross profit, and transfers from the government included other subsidies on production. Formation of enterprises incomes in SAM is reflected only as factor incomes, which make 100 % of total enterprises incomes[5]. The data published by Goskomstat RF on taxes and subsidies on production shows, that a share of other subsidies on production in the total enterprises income tends to decrease. Subsidies on production made 16-22 % of total enterprises income in 1995-1997 and only 6.5 % in 2001 [Nasional'nye.., 2003, p. 20]. Thus, increase of income flow from enterprises to government accompanied by reduction of a counter flow of transfers from government to enterprises.

As we marked above, a share of incomes generated and redistributed by government shown the tendency to increase. Increase of a share of incomes received due to taxes on products (from 20,2 % in 1995 up to 32,8 % in 2001) was observed in government sector. Dynamics of other structural elements was unstable, the tendency was more obvious after 1998 when a share of incomes of government received from enterprises gone down, and received from households rose.

Thus the shifts in income distribution among institutional sectors occurred under conditions of economic growth are bound up with increase of a share of the government in primary and disposable incomes. Household income became a source of rise of government share in the greater measure, a share of transfers from households in incomes of government sector increased. A share of transfers from enterprises reduced a little therefore a share of enterprises in primary and disposable incomes has grown in 1999-2001 in comparison with 1995-1998.

[5] Tax presented in SAM as net, i.e. tax less subsidies, since gross tax transfers from enterprises to government is higher then transfer of subsidies from government the value of transaction "transfers from government to enterprises" in SAM equals zero.

ESTIMATION OF TAX BURDEN ON INSTITUTIONAL SECTORS

Structure of generated incomes as the initial stage of income distribution and disposable income as final stage of redistribution are resulted above. Taxes and transfers represent a mechanism of income redistribution among the institutional sectors in socio-economic system. They are formed under influence of various factors, historically developed redistribution mechanism plays the important role in particular social security system, property on production factors, and also purposeful state policy, current tax rates on institutional sector income, governmental expenditure, subsidizing of enterprises and households and so on.

Data available from accounts of institutional sectors allowed to estimate aggregate effective tax rates on institutional sectors incomes in 1995-2001. The period includes only one year during the new tax code operated – 2001, nevertheless, it defines directions of changing in income redistribution system, developing in the Russian economy.

There are various approaches to measurement of effective tax rates at macroeconomic level and aggregate tax burden in economy, which propose different strategies to combine information on stationary tax schedules, tax returns, and tax codes with the data of income distribution, household survey and so on. A set of structural parameters can be calculated on SAM base, which are similar under their economic matter to measurement of tax rates for macroeconomic models[6]. The results of complex system of tax payments, tax credits, exemptions and deductions are submitted in SAM by aggregated sums of tax transfers determining a net flow of income from institutional units to the government, which cover all variety of tax transfers between the institutional unit and government. It allows to compare aggregate tax burden on different institutional sectors and on the same sector in different years that is very difficult by direct comparisons of tax payments as the taxation system changed practically every year during the considered period, including the list of taxes, tax rates, tax privileges, tax collection, etc.

Data on tax transfers of institutional sectors at various stages of income redistribution is concentrated in the sum of transfers from institutional sector to government. For macroeconomic analysis of institutional sectors interrelations all acting taxes can be aggregated into three types: taxes on products, taxes on enterprises income, and taxes on household income.

Taxes on products are levied proportionally to quantities or value of goods and services produced therefore a tax base for estimation of effective tax rate on products is the value added. Income is a taxation object of institutional sectors therefore tax burden can be measured as a ratio of tax transfers from institutional sector to government to total income of the sector. As SAM includes net taxes, i.e. less subsidies for comparability of effective tax rate on sector incomes the transfers of households also calculated as net (as a balance of receivable and payable transfers). Disposable income used as a tax base for estimation of effective tax rate on household incomes. Effective tax rate on products, on enterprises incomes, and household incomes as well aggregated tax burden on the economy submitted in table 5.

Table 5. Tax burden on institutional sectors in the Russian economy (%)

	1995	1996	1997	1998	1999	2000	2001
Taxes on products	8.5	9.3	9.5	9.6	11.6	12.9	13.8
Taxes on enterprises income	45.5	45.5	52.7	44.8	38.3	34.9	29.5
Taxes on households income	4.1	4.3	5.2	4.7	5.1	5.3	5.9
Aggregated tax burden	24.7	23.0	24.8	24.0	27.8	28.6	27.8

Source: calculated on base of SAM.

[6] Actually estimated parameters are not tax rates as they are defined in the theory of taxation, it is more correct to name these parameters “tax burden” as they combine various taxes and show the ratio of tax payments to income of institutional sector.

Aggregated tax burden calculated as ratio of total value of taxes on products, taxes on enterprises incomes, and taxes on household incomes to GDP value.

As we mentioned above estimated effective tax rates reflects only tax transfers as they are referred in SNA, as that as net transfers from institutional sectors to government less return flow of transfers from government. According to SNA methodology compensation of employees consists of two components: wages and salaries, and contributions of employers to social insurance funds that includes taxes on income and other compulsory payments which have to be paid by employees even if they are paid out directly to social security bodies and tax authorities on behalf of employees. For the same reason contributions to social insurance funds paid now in Russia, as social tax by employers does not concern to taxes on enterprises and considered as compensation of employees, i.e. households income.

The estimated aggregated "net real" tax burden makes more than ¼ of the Russian GDP.

Our estimation of tax burden differs from the similar estimations, published by other authors where "nominal" tax burden is defined. A. Belousov estimates a tax burden as a sum of tax incomes of the consolidated budget, incomes of special budgetary funds and the uniform social tax [Belousov, 2004]. The level of tax burden in Russia has made according to these calculations 30,5% in 1999, 33,9% in 2000, 33,9% in 2001, 34,3% in 2002. However, if the payments to social funds which make about 7 % of GDP are added to SAM estimation the tax burden on the Russian economy appears higher, than it follows from Belousov's estimation and makes 35,2% in 1999, 36,3% in 2000, 34,5% in 2001.

Tax burden has changed after 1998 as well as other macroeconomic indicators. The economic growth in 1999-2001 has occurred under the conditions of growing tax burden that contradicts the opinion prevailing in the Russian literature that the heavy tax burden is probably the main obstacle for economic growth. However, this appeared possible as the economic growth and the increasing tax revenues resulted from intensively extending economic base connected in particular with a favorable world market conditions and therefore did not contradict each other. However since 2003 the opportunities for simultaneous maintenance of a high level of tax burden and intensive growth of production and investments have decreased sharply.

Growth of aggregated tax burden has been caused by increase of tax rates on products and household income.

The significant share of taxes on goods and services (VAT, excise duties, customs duties, the sales tax), which make more than 1/3 of total tax revenues, is a prominent feature of the Russian economy, which can be explained by two circumstances. Firstly, taxes on products and services are characterized by a high collection level and at the same time are easy to administer. Secondly, growth of revenues from taxes on products is connected with a specific Russian fiscal tool - export duties.

Therefore growth of the tax rate on products has been caused under condition of oil prices increasing by reinforcement of policy of public revenues formation through the mechanism of taxes on products whereby the government withdraws a part of exports incomes.

The most essential distinction of the Russian tax system from other countries is the structure of tax incomes where the share of taxes paid by corporate sector is extremely high and the share of taxes on incomes of the population is low. Therefore one of main principles of tax reform is redistribution of tax burden from production to consumption.

Tax rate on enterprises income increased until 1997 when she has made 52.7 % of total incomes of enterprises, its remarkable reduction occurred in 1999-2001 (up to 29,5 % in 2001).

Effective tax rate on household incomes has grown made the highest for all considered period, after coming into force in 2001 the flat tax scale of personal income tax. That can be explained by income legalization, expanding of tax base due reduction of preferential categories of taxable persons and increase of tax collection. Decrease of effective tax rate was real only for enterprises (5.4 points in 2001 in comparison with 2000). Thus the idea of lowering of tax burden on enterprises and its carrying on final consumption (taxes on products) and household incomes has been realized.

We specified above the particular features of effective tax rate estimation reflected only "net" tax burden and using of SNA approach to referring of transfers, in particular, contributions to social insurance funds. Effective tax rates can be measured in another way, used mainly in general equilibrium framework when tax rates on factor income and consumption considered as exogenous variables of economic policy [Mendoza, 1994, Mendoza…, 1995].

The key issue for the construction of a reliable estimate of effective tax rate is the measurement of tax revenues and tax bases as pre-tax and post-tax valuations of consumption, and income derived from labor and capital. Effective tax rate determined as a ratio of the difference between pre-tax and post-tax valuation of consumption, labor income, and capital respectively to value of consumption and income derived from labor and capital at pre-tax prices correspond to measures of tax base affected by each tax.

Following [Mendoza, 1994] principles, households purchase the goods for consumption and pay an ad-valorem tax, which rate corresponds to the percentage difference between the post-tax consumer price and the pre-tax price at which firms supply goods.

Data on revenues of indirect taxes (value-added tax and excises) can be used as a numerator for measurement of tax rate on consumption. The denominator is a measure of consumption at pre-tax prices, which represents a value of consumption at post-tax prices less revenues from taxes on consumption, in our case, indirect taxes. Household final consumption in SNA is submitted at purchaser prices included all payable taxes. Government final consumption of goods and services must be included in the denominator because SNA reports data on total revenues of taxes on products that included taxes paid by governmental organizations and NPISH. However, this only applies to purchases of goods and services used for government final consumption, hence the compensation of government employees must be deducted from total value of government consumption. So the effective tax rate on consumption (τ_c) can be determined as follows (the key to variables described below):

$$\tau_c = \left(\frac{Tcs + Ex}{C + G - GW - Tcs - Ex} \right) \cdot 100$$

The effective tax on labor income corresponds to the percentage difference between the post-tax and pre-tax labor income. The estimation of this tax rate in practice is difficult because reported income taxes are not divided on taxes on factor income, and notional categories «taxes on labor income» and «taxes on capital» should combine different taxes which rates are measured in relation to different tax base.

We assumed, that all sources of household incomes are taxed uniformly it seems reasonable taking into account, that during the considered period wage and salaries consisted about 80 % of household incomes.

Taxation of contribution to social insurance funds represented a part of tax on labor income is another problem of measurement of effective tax rate on labor. We begin by computing the average tax rate on total household income (τ_h) defined as the household income taxes divided by total household incomes at pre-tax prices, included wages and salaries, property incomes and total mixed income. Then we compute the average tax rate on household incomes as:

$$\tau_h = \left(\frac{Tp}{MI + PEI + W} \right) \cdot 100 .$$

Tax revenues on wages and salaries taxed according our assumption by average tax rate on household incomes consists one part of total revenues from tax on labor income, contribution of employers to social insurance funds forms another part. Their sum represents the numerator of effective tax rate. Denominator includes wages and salaries and employers' contribution to social security payable directly by the enterprises as social transfers. The effective tax rate on labor income computed as:

$$\tau_l = \left(\frac{\tau_h W + So}{W + Se} \right) \cdot 100 .$$

Tax revenues on the capital also include two parts: taxes on capital, payable by households, and taxes on capital payable by enterprises. Tax revenues from the mixed income, and property income make the first part of total revenues from tax on capital, taxes on enterprises incomes, current property taxes, financial operations taxes consist the second part. Capital income at pre-tax prices can be measured as gross operating surplus of economy defined as output at producer prices less intermediate consumption, compensation of employees, consumption of fixed capital and net indirect taxes, i.e. represents net profit of the economy. Value added in the Russian national accounts in 1995-1998 calculated on gross base, i.e. including consumption of a fixed capital therefore gross operating surplus use as taxable base for computing tax rate on capital. Effective tax rate on capital (τ_k,) determined as:

$$\tau_k = \left(\frac{\tau_h (MI + PEI) + Tk + Tre}{OS} \right) \cdot 100$$

We used the following parameters for computing effective tax rates.

Data on tax revenues:

Tp - taxes on income of individuals;

Tk - taxes on income, profit and the capital gains of corporations;

So - total social security contributions;

Se – enterprises' contributions to social security;

Tre - property taxes;

Tcs - taxes on products;

Ex - excises.

Data of national accounts:

C - household expenditures on final consumption;

G - government expenditures on final consumption;

GW - compensation of government employees;

MI – gross mixed income;

PEI – property incomes of households;

W - wages and salaries;

OS - gross operating surplus.

Estimated effective tax rates for 1995-2001, for which statistical data are available resulted in Table 6.

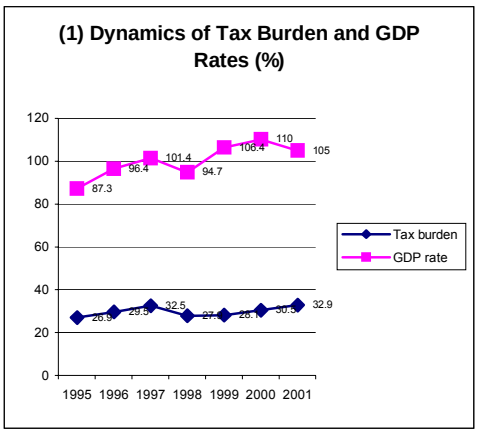
Table 6. Effective tax rates in the Russian economy (%)

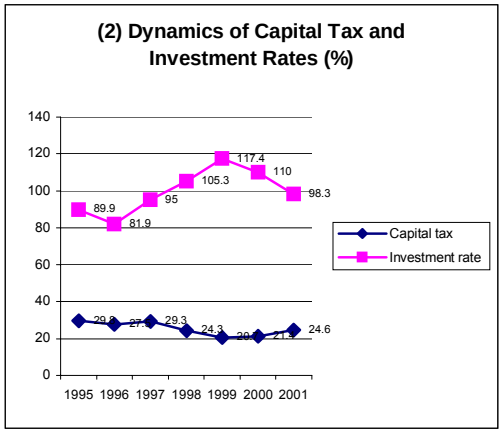
	1995	1996	1997	1998	1999	2000	2001
Consumption	14.0	17.3	18.0	15.1	15.7	18.9	20.9
Labor income	20.8	23.0	24.2	23.5	21.8	23.5	29.5
Capital	29.8	27.5	29.3	24.3	20.7	21.4	24.6
All taxes	26.9	29.5	32.5	27.9	28.1	30.5	32.9

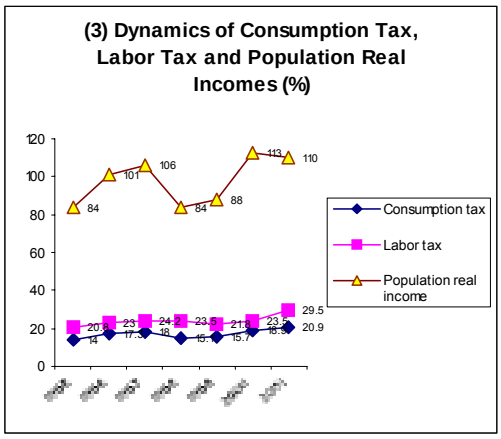
Source: our calculation

Estimated rate of the enterprises income tax shows the tendency to its decrease, however the rate of capital tax in 2000-2001 grew, especially appreciable its growth appeared in 2001.

Analysis of the rates of taxes on production factors shows "unequivocally correct" correlation between the indicators of macroeconomic dynamics in the years 1999 and 2001 (Figure 1-3): growth of tax burden on the economy in 2001 has coincided with the decrease in GDP growth rates and population real incomes, growth of the tax rate on capital has resulted in reduction of growth rates of investments.







There is no direct correlation between the macroeconomic indicators in 2000, when all of them increased despite of growing tax burden. However, as it was already mentioned above the oil prices have increased in 2000 by almost 80% that has reversed the negative impact of all other factors. We are not inclined to explain the decrease in growth rates in 2001 only by growth of tax burden as oil prices have also decreased in that year, nevertheless one should not exclude the negative impact of taxes growth. Computed effective tax rates differ at absolute value from SAM estimation of tax burden on institutional sector incomes. However, in both cases estimates of aggregated tax burden reveal the obvious tendency to their growth.

Economic growth in 1999-2001 occurred under conditions of aggregated tax burden growth (a share of total taxes revenues in GDP), and also accompanied by growth of effective rates of all considered taxes. Taxes on consumption and household incomes grew most intensively (1.4 times in 2001 in comparison with 1998), taxes on capital in 1999-2000 were lower than in 1998, but in 2001 matched to rate of 1998.

Thus, estimation of aggregated tax burden on institutional sectors and effective tax rates finds out the identical tendency to growth of tax burden in the Russian economy accompanied the economic growth in 1999-2001. Increase of tax burden on institutional sectors accompanied by simultaneous reduction of transfers from government to households and enterprises resulted in remarkable increase of a share of the government in disposable incomes observed during period of economic growth.

EXPENDITURES OF INSTITUIONAL SECTORS

Institutional sectors carry out various functions in circular flow, shifts in income distribution among sectors lead to change in distribution of their expenditures on consumption and savings,

and to changing in proportions of a final demand: household final consumption, government final consumption, and capital accumulation.

Analysis of expenditures structure of institutional sectors also can be implemented in the SAM framework. Expenditures distribution of institutional sectors differs for period of recession and growth as well the structure of incomes. Remarkable structural changes appeared during the considered period in expenditures distribution of the enterprises. A share of transfers from enterprises to government and especially to household decreased in 1999-2001 and a share of savings has grown. It has been caused by weakening of social burden on the enterprises, a share of transfers to households decreased in 2001 in compare with 1995 almost 2 times (from 15.5% to 8.9%) and also by reduction of tax burden on the enterprises (Table 7). As a result of structural shifts in enterprises expenditures the savings have reached in 2001 the highest level for all period – 68.8 %.

Household incomes decreased concerning other sectors have been redistributed for the benefit of final consumption. Final consumption expenditures reached 83.5 % of total household expenditures in 1999 when households have been forced to spend almost all disposable incomes to support the consumption after financial crisis in 1998. A share of final consumption expenditures decreased a little in 2001-2002 however remained higher than during the economic recession.

Table 7. Structure of institutional sectors expenditures in 1995-2001(%)

Institutional sectors	1995	1996	1997	1998	1999	2000	2001
Enterprises							
Transfers to households	15.5	17.9	6.5	13.4	11.9	10.0	8.9
Transfers to government	38.5	31.8	38.9	22.5	29.3	23.3	22.3
Savings	46.0	50.3	54.6	64.2	58.8	66.8	68.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Households							
Final consumption	70.0	65.0	67.9	75.2	83.5	75.0	75.4
Transfers to government	16.5	18.3	19.8	19.9	18.4	19.6	18.3
Savings	13.5	16.7	12.3	4.9	-1.9	5.3	6.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Government							
Final consumption	56.3	58.6	60.9	57.7	39.9	41.4	47.2
Transfers to households	22.9	27.2	28.9	26.6	18.6	18.0	22.4
Savings	14.8	8.2	2.9	1.4	26.1	28.7	20.5
Rest of the world	6.0	6.0	7.3	14.3	15.5	11.8	9.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: calculated on base of SAM.

Government final consumption expenditures decreased as well transfers to households during the period of growth in comparison with 1995-1998 and a share of savings in government sector has grown.

Thus changes of ratio between current expenditure and savings occurred in all institutional sectors. Savings rate in the Russian economy has grown from 27.9 % in 1995 up to 33.2 % in 2001. Taking into account that savings rate in 1996-1998 reduced in 2001 she was almost doubled in comparison with 1998.

A share of savings in total expenditures has increased in all sectors, except for households for the period as a whole. Savings made 12-16 % from household expenditures until 1998. The financial crisis actually liquidated household savings that is the household savings have been withdrawn by the state in second time during the reforms. Households redistributed their expenditures in these conditions for the benefit of current consumption of goods and services to

compensate decrease in a living standard. Household savings appeared negative in 1999, in 2001 made 6.3 % from total household expenditures having decreased more than in 2 times in comparison with 1995.

A share of savings in government expenditures followed the tendency of national savings rate. Savings of enterprises increased almost monotonously, exception also was 1998. Growth of savings rate observed for national economy after financial crisis took place in sectors of government and household. Government savings rate increased from 1.4 % in 1998 up to 28.7 % in 2001 that occurred due to decrease in a share of the government final consumption.

Cardinal changing in savings distribution among the institutional sectors reflected in the capital account (Table 8) occurred in 1999-2001, she was characterized by redistribution of savings from households to government. Till 1998 a household share in total savings made about 30-40 % whereas government share during this period was very low but after crisis in 1998 a household share in savings reduced strongly.

Table 8. Structure of incomes in capital account in 1995-2001(%)

	1995	1996	1997	1998	1999	2000	2001
Enterprises	45.5	39.8	47.6	79.3	65.1	53.9	71.8
Households	34.2	46.1	39.3	18.9	-4.3	8.0	13.2
Government	20.6	11.6	5.2	2.9	37.1	27.9	25.1
Rest of the world	-0.4	-0.4	-0.8	-1.0	-0.8	10.2	-10.0
Statistical discrepancy	0.0	2.9	8.8	0.0	2.9	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: calculated on base of SAM.

Problem of sizeable household savings in the Russian economy, which could serve as investment resources, was repeatedly discussed in the literature. However household savings have ceased to be an essential potential investment resource of economy after crisis in 1998. They were negative in 1999, household savings made only 13.2 % of total savings in 2001 in spite of the fact that remarkable growth of real population incomes was observed within 2000-2001. Potential investment resources have concentrated in sectors of enterprises and government, and the issue of use of the household savings as investment resources has lost the scales.

However redistribution of savings among the institutional sectors has not cracked a problem of transformation of savings into investments. After 1998 a share of investments in total savings even decreased in comparison with 1995-1998 (Table 9). National savings redistributed for the benefits of enterprises and government have been in a great extent directed not on investment but on net lending of the other world that is reflected in appreciable growth of net lending in 1999, 2001.

Table 9. Savings and investments in the Russian economy in 1995-2001(%)

	1995	1996	1997	1998	1999	2000	2001
Savings rate (total saving as percentage of GDP)	27,9	26,7	19,5	19,0	30,6	35,9	33,4
Ratio of investments to total savings	61,2	65,5	76,3	78,0	51,1	44,5	52,9

Source: calculated on [Rossiiskii…, 2002]

Shifts in income distribution among the institutional sectors and their expenditures structure led to changing in final demand structure and thus impact on GDP growth rates. Household expenditures form household final demand, government expenditures on final consumption – final demand of governmental organizations and NPISH, savings of enterprises and government - total accumulation of economy, demand of rest of the world represents export. Structural shifts in final demand in the Russian economy in 1999-2002 occurred under impact of export demand growth

due to which a share of all other elements of final demand decreased. In 2002 an export demand share decreased in comparison with 2000, however remained much above a pre-crisis level (Table 10).

Table 10. Structure of final demand in 1995-2001(%)

Year	Households final consumption	Government and NPISH final consumption	Gross capital formation	Exports	Total
1995	40.0	16.5	20.2	23.3	100.0
1996	41.4	17.6	19.5	21.5	100.0
1997	43.0	18.8	17.9	20.2	100.0
1998	45.4	16.8	12.2	25.5	100.0
1999	41.5	12.5	11.8	34.3	100.0
2000	36.4	13.0	15.1	35.5	100.0
2001	38.7	14.1	17.8	29.4	100.0
2002	40.3	14.7	17.0	28.0	100.0

Source: calculated on [Natsional'nye…, 2003, p. 19]

Reduction of a household share in total incomes led to decrease of a household share in total final demand in 1999-2000, and she was almost equal to a share of export demand in 2000. Redistribution of incomes for the benefit of enterprises has caused growth of gross accumulation share took place in 1999-2002 however within economic growth (1999-2001) this share was lower, than in 1995-1998. The marked income redistribution for the benefit of government has not led to growth of a government final demand share in GDP, which has decreased in comparison with 1995-1998.

Final demand structural changes have been appreciably caused by price factor. Elimination of price factor shows, that a share of government final consumption in GDP even reduced, i.e. taking into account price factor government expenditures directed at final consumption were even less, than values in the current prices. Household share of final demand estimated in constant prices in 1998-2000 has increased.

Estimation of final demand factors contribution into growth rates of the Russian economy in 1999-2002 shows that household expenditures on final consumption together with export demand represented the most stable sources of growth which compensated the increasing negative contribution of import into GDP growth (Table 11).

Table 11. Factor contribution in economic growth in 1999-2002 (%)[7] (constant prices)

	1999		2000		2001		2002	
	A	B	A	B	A	B	A	B
GDP growth rate (A), total increase (B)	6.35	100.0	10.04	100.0	5.04	100.0	4.30	100.0
Contribution of:								
Households expenditures for final consumption	-1.64	-25.8	3.69	36.8	4.92	97.5	4.31	100.1
Government expenditures for final consumption	0.68	10.7	0.44	4.4	-0.28	-5.6	0.35	8.2
NPISH expenditures for final consumption	-0.03	-0.4	0.03	0.3	0.02	0.5	0.05	1.2
Gross capital formation	0.97	15.3	2.77	27.6	1.94	38.4	0.56	13.0
Change in inventories	-1.85	-29.1	5.88	58.5	1.45	28.7	-0.19	-4.3

[7] Factor contribution calculated as a share of increase of relative indicator in total GDP increase. All indicators are in constant prices.

Exports	3.96	62.4	3.51	34.9	1.77	35.0	4.69	109.1
Imports	4.24	66.8	-6.28	-62.5	-4.77	-94.5	-5.47	-127.3

Source: calculated on [Natsional'nye…, 2003, p. 69]

As it was assumed above, the concentration of disposable incomes in government sector marked in 1999-2001 did not become an essential factor of economic growth. Contribution of government expenditures on final consumption into growth rate was low at elimination of price factor it appeared even negative in 2001. Increase of enterprises share in primary incomes, reduction of tax burden on enterprises, and growth of enterprises savings also have not made this sector a stable factor of growth. GDP growth caused by accumulation factor was high enough in 2000-2001 however it has made only 8.7 % in 2002.

Thus, structural shifts in household expenditures after 1998 became apparent as growth of household expenditures on final consumption occurred despite of relative reduction of household incomes. Reduction of transfers to households has allowed enterprises and government to increase savings however it has not led to growth of savings share transformed into investments. Government incomes received due decrease of government final consumption and transfers to households have been directed on savings and redistributed for the benefit of rest of the world, which share has grown in 2 times in 1998-2000 in comparison with 1995-1997, made about 10 % of government expenditures. The contribution of export sector to economic growth was essential during the whole period. GDP growth in 1999 has been completely caused by growth of export and reduction of import resulting from rouble devaluation. In 2000-2001 approximately 1/3 of total GDP increase has been provided due to export. In 2002 the increase of export was higher than total growth of GDP, however it could not eliminate the increased negative effect of import. Total export growth effect has been caused by increase in its physical volume that caused approximately 10 % of total increase in all the years, excluding 2001, as well as by a significant rise in prices on the exported goods in 1999-2000 (Table 12).

Table 12. Volume indices and deflators of the GDP by type of expenditures[8] (% to previous year)

	Volume indices				Deflators			
	1999	2000	2001	2002	1999	2000	2001	2002
GDP growth rate	106.4	110.0	105.0	104.3	172.5	137.6	117.8	115.2
Households expenditures for final consumption	97.1	107.3	109.9	108.6	178.0	121.6	119.3	115.4
Government expenditures for final consumption	103.1	102.0	98.3	102.4	138.5	153.6	136.2	121.6
NPISH expenditures for final consumption	98.6	101.6	101.9	104.5	116.8	138.4	123.9	137.2
Gross fixed capital formation	106.4	118.1	110.5	103.0	153.6	150.3	123.9	112.2
Change in inventories	-	-	172.0	94.1	-	-	131.9	119.0
Exports	111.2	109.5	103.6	110.2	228.2	141.0	98.3	104.4
Imports	83.0	132.4	118.0	119.1	235.7	105.1	102.6	102.8

Source: [Natsional'nye…, 2003, p. 72,76]

The important feature of growth in 2000-2002 was fast growth of import, which was noticeably higher than export growth, and the rise in import prices which growth rate was generally higher or equal to export prices growth rate except for the year 2000. As a result of such dynamics export incomes exceeded expenditures on import in 1999-2000, in 2001-2002 export incomes were either lower, or practically equal to import expenditures thus the situation was generally similar to the situation in 1980s in the Soviet economy when growing export incomes were spent on current consumption of imported goods.

[8] When the indicators in two periods under comparison have opposite or negative signs, index is not computed.

Growing income of extracting sector of the economy, first of all of oil-producing sector represent the major factor of increasing export incomes. Incomes from crude oil export made about 25% of total Russian export incomes, while income from export of oil products made another 10%. The significant rise of oil prices in 2000 has led to major increase of incomes from crude oil export, which increased in comparison with the preceding year by almost 80% (Table 13). In 2001-2002 the oil prices were lower than in 2000, however export incomes grew due to increase in physical volume of export.

In order to characterize how much influence the rising oil prices have had on macroeconomic dynamics we have estimated GDP in 2000-2002 under the condition of preservation of the oil prices at the level of the preceding year. Comparison of the estimated GDP with the actual indicator showed what impact the changes in oil prices had on GDP. So, if the crude oil prices were the same in 2000 and 2001, GDP in 2001 in the current prices would have exceeded the actual GDP by 9.7%. Unlike in 2000 and 2001, despite of oil prices growth in 2002, its contribution to GDP growth has decreased noticeably.

Table 13. Estimation of crude oil prices contribution into GDP growth

	1999	2000	2001	2002
Crude oil export (mln tons)	134.8	145	161.6	188.7
As ratio to previous year	1	1.076	1.114	1.167
Crude oil price (dollars/ ton)	111	185	156	163
As ratio to previous year	1	1.667	0.843	1.045
Export crude oil earnings (mln dollars)	14155	25284	24576	28950
As ratio to previous year	1	1.786	0.972	1.178
GDP growth (current prices)	1.834	1.515	1.237	1.202
Adjusted GDP growth (crude oil prices of previous year)	-	1.428	1.334	1.177
Contribution of crude oil prices	-	0.087	-0.097	0.025

Source: Calculated on base of [Rossiiskii…, 2003]

Our estimations were constructed as simple statistical calculations and took into account only the direct influence of the changes in crude oil prices on macroeconomic indicators, not reflecting the indirect effects arising in the economy due to the growth of oil export, and are therefore insufficient for making a conclusion that the dependence of the Russian economy growth on oil export began to decrease, as it follows from Table 13. However a similar conclusion can be made if using more sophisticated methods, taking into account the real interrelations in the economy. According to TsMAKP estimations the oil prices contribution in economic growth has made 49 % in 2000, 20% in 2001, and appeared negative in 2002 [Ekonomicheskie…, 2003].

Easing of dependence of macroeconomic dynamics on oil price is also marked by other authors [Gavrilenkov, 2004; Tikhomirov, 2004]. Gavrilenkov showed that industrial growth rates were closely correlated with the oil price until mid-2002. After mid-2002 the growth model has changed, a clear positive correlation emerged between the real effective exchange rate and productivity.

MULTIPLICATIVE EFFECTS OF REDISTRIBUTION

Institutional sectors interacted within the national economy, and also are under influence of externally intervening forces affected from the rest other the world. The estimated SAM shows that rest of the world makes the most essential direct impact on income and expenditure distribution of government sector. But the question is: how can internally structuring forces and externally intervening forces working together explain tendencies of income redistribution and their impact on economic performance.

The SAM can be converted into a circular flow model generated a set of multipliers, which can help explain the internal and external mechanisms of economy. SAM multipliers are more

comprehensive than those of Keynes and Leontief together, because the SAM contains the whole circular flow.

To convert the SAM into a model a sub-division of the SAM rows and columns between endogenous and exogenous variables is required. Exogenous variables reflect externally intervening forces impacted on the economic performance, endogenous variables describe internally structuring forces working in process of income distribution and redistribution.

To explore income distribution among the institutional sectors we assumed that column of rest of the world is exogenous because behavior of this sector cannot be explained in terms of income and expenditures of institutional sectors. Besides revenues receivable from rest of the world are mainly exports incomes, their impact on formation of institutional sector income and economic growth is very strong. By separating the influence of externally intervening forces from the rest of the world it becomes feasible to study the rest of the economy consisting of factors, households, enterprises, and government, as an internally functioning economic structure. In a sense multipliers represent the effect of rest of the world injection (changing of export and transfers from rest of the world) on income of institutional sectors.

Absolute value of multiplier depends on particular model for which it was computed, i.e. from a level of matrix aggregation, a sub-division into endogenous and exogenous variables, interactions between them. With other things being equal a multipliers value is more, than less endogenous flows reflected in SAM. SAM multipliers calculated for 1995-2001 represent this effect. Absolute values of multiplier are highest in 1995-1998 when income redistribution flows were relative less, than after 1998. The diminishing income and output multiplier effects in 1998-2001 can be interpreted as a strengthening of income redistribution.

Compiled SAM for 1995-2001 allow a decomposition of economic performance represented by basic macroeconomic indicators (output, institutional sector incomes, total savings) within different time periods into that part which is due to changes in SAM multipliers and that part which is due to changes in the exogenous variables represented in the account of rest of the world[9].

Let x - vector of exogenous variables in a static equilibrium model constructed on SAM base, y - vector of endogenous variables determined in model, S - matrix of average propensities received by dividing elements in each column by its column total, M - multipliers matrix. The vector of endogenous variables can be solved from the following system of equations [Cohen, 1996; Cohen, 1998]:

$$y = Sy + x = (I - S)^{-1} = Mx$$

If we have SAM for two periods S_0 and S_1 then the change in endogenous variables can be submitted as follows:

$$\Delta y = y_1 - y_0 = M_1 x_1 - M_0 x_0 .$$

Changes in the endogenous variables can be explained in terms of two effects: a change in the multiplier matrix $(M_1 - M_0)$ and change in the exogenous vector $(x_1 - x_0)$. Using standard transformations receive:

$$\Delta y = y_1 - y_0 = M_1 x_1 - M_0 x_0 = M_1 x_1 - M_1 x_0 + M_1 x_0 - M_0 x_0 = M_1 \Delta x + \Delta M x_0$$

As a result, the change in an endogenous variable is decomposed into a change in exogenous variables (at constant SAM multipliers) $M_1 \Delta x_0$, and a change in SAM multiplier (at constant exogenous variables $\Delta M x_0$.

From the analysis of SAM parameters follows, that the difference in income distribution structure was significant between 1995-1998 and 1999-2001, therefore the estimation of impact of a changing in the exogenous variables and a changing in the multiplier matrix on an endogenous variable has been implemented for three periods: 2001 in comparison with 1995, 2001 in

[9] National accounts data include a statistical discrepancy to balance the accounts. Statistical discrepancy has been added to exogenous variables in the account of rest of the world.

comparison with 1998 and 1998 in comparison with 1995. Estimation of the effects are resulted in Table 14, all indicators are in current prices.

Table 14. Contribution of exogenous factor and multiplier changing into growth of macroeconomic indicators

Macroeconomic indicators	Y_1/Y_0	X_1/X_0	Δy	Δx	$M_1\Delta x$	ΔMx_0	$(M_1\Delta x)/\Delta y*100\%$	$(\Delta Mx_0)/\Delta y*100\%$
2001/1998								
Output	350.8	390.2	13802598	2439823	14170954	-368355	2.7	-2.7
Factor income	317.9	576.3	5458177	15033	5846407	-388228	7.1	-7.1
Enterprises income	446.6	-	2212272	0	2092816	119456.3	-5.4	5.4
Household income	287.5	-	3736372	0	4210263	-473890	12.7	-12.7
Government income	319.9	596.8	2295951	158505	2471475	-175523	7.6	-7.6
Savings	528.7	5135.1	2214624	-268419	1942042	272581.3	-12.3	12.3
Total	343.6	369.4	29719994	2344942	30733957	-1013959	3.4	-3.4
2001/1995								
Output	588.9	768.8	16028212	2853744	16672291	-644078	4.0	-4.0
Factor income	560.4	2396.4	6542123	17430	6878109	-335984	5.1	-5.1
Enterprises income	673.0	-	2426914	0	2462131	-35216.1	1.5	-1.5
Household income	451.8	-	4460528	0	4949115	-488586	11.0	-11.0
Government income	450.0	880.1	2597835	168773	2889189	-291353	11.2	-11.2
Savings	638.4	17868.8	2303350	-272218	2324282	-20932.1	0.9	-0.9
Total	554.4	718.4	34358962	2767729	36175116	-1816151	5.3	-5.3
1998/1995								
Output	167.9	197.0	2225614	413921	2679641	-454027	20.4	-20.4
Factor income	176.3	415.8	1083946	2397	1220285	-136339	12.6	-12.6
Enterprises income	150.7	-	214642	0	310918.1	-96276.1	44.9	-44.9
Household income	157.1	-	724156	0	969082.6	-244927	33.8	-33.8
Government income	140.7	147.5	301884	10268	502974.3	-201090	66.6	-66.6
Savings	120.7	348.0	88726	-3799	250313.2	-161587	82.1	-82.1
Total	161.4	194.5	4638968	422787	5933215	-1294247	27.9	-27.9

Source: calculated on base of SAM.

The obtained results show that period of 1995-2001 was characterized by growth of nominal institutional sector incomes caused by exogenous variables, i.e. aggregates of the account of rest of the world, first of all, exports, government transfers, received from rest of the world, and capital transfer, the last one was negative in all years, except for 2000. Changes in income distribution proportions (changes of SAM multipliers) worked against the growth of sector income and output, in other words if the structure of income distribution did not change nominal growth of incomes would be higher. For the period as a whole the changes in income distribution have affected to the greatest degree on household income, if distribution proportion of 1995 were kept all period that household incomes would grow on 11 %.

Real growth of production and institutional sector incomes occurred in 1999-2001. Changes in SAM multipliers affected negatively on household and government incomes for this period. But changes in income distribution contributed to growth of enterprises incomes and savings. As for the whole period changes in income distribution have affected to the greatest degree on household income in 1999-2001. In 2001 in comparison with 1999 due to changes in income distribution households have lost 12,7 % of potential incomes, which could be gained by sector if the distribution of 1998 was kept.

The analysis limited by fact that all SAM are compiled in current prices, growth of price indices between 1995 and 2001 and even between 1998 and 2001 was essential. Revaluation of SAM in constant prices presents difficulties technically and substantially, as there are difficulties of interpretation of incomes and expenditures estimates in constant prices. Revaluation of SAM in constant prices destroys matrix consistency if we use different price indices for different categories of incomes and expenditures. Rough revaluation can be made, by using the same deflator for example GDP deflator for all indicators.

We implemented notional calculation of impact of a changing in the exogenous variables and a changing in the multiplier matrix on endogenous variables in constant prices by using GDP deflator for 1999-2001. Elimination of price factor has led to change of absolute values of exogenous and endogenous factors contributions, however signs of factors contributions have not changed, that confirms a conclusion drown above that changes in income distribution among the institutional sectors, reflected in SAM multipliers, affected positively on growth enterprises incomes and total savings. Contribution of changing in SAM multipliers to growth of all other aggregates appeared negative. In particular, if income distribution of 1998 kept (with other things being equal), GDP would appear in 2001 on 7.1 % above its real level, government incomes – on 7.6 %.

CONCLUSION

Social accounting matrices for Russia have been compiled on the basis of official statistical data published by Goskomstat RF in aggregated form for 1995-2001 and disaggregated form for 2000. Estimated matrices were used for analysis of economic development in 1995-2001.

Structural shifts in income generation and distribution among the institutional sectors in 1995-2001 as it resulted from the analysis of aggregated SAM worked for strengthening of primary and disposable incomes redistribution from households and enterprises for the benefit of government. Relative reduction of a household share in disposable income did not accompanied by proportional decrease in their share in a final demand that has been caused by redistribution of household disposable incomes for the benefit of the current consumption at significant reduction of household savings. After financial crisis in 1998 the household savings have been actually destroyed and have ceased to play a role of potentially large source of internal investments.

Enterprises sector appeared in a more favorable position in comparison with households, income outflow from enterprises to government was less intensive, that has allowed enterprises to increase a share of savings. A saving rate also has been increased by government sector, but effective mechanism of saving transformation into investments has not been realized. An investment share in the total savings during period of economic growth appeared even below, than in 1995-1998.

Incomes redistributed from households and enterprises for the benefit of government have not been directed for the government final consumption. Government savings grown a little, but an increasing share of government incomes redistributed for the benefit of rest of the world.

Taxes and transfers represent income redistribution mechanism. During the all period a share of transfers, received by enterprises and households from the government reduced. At the same time aggregated tax burden increased, weakening of tax burden during period of economic growth was observed only for enterprises sector that served as one of economic growth factor.

With respect to exogenous stimulus of economic growth the results indicates that income redistribution affected positively only on growth of enterprises incomes and savings, but they worked against the growth of household incomes and output.

Income redistributed for the benefit of government from households due rising of effective tax rate on household income and reduction of government transfers increased a government share in disposable incomes, however these incomes have not been used as sources of economic growth.

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ANNEX 1.

The detail description of the relevant cell in table 1 is presented below.

(1,2) Activities –Commodities[10]

This transaction corresponds to the gross output in basic prices. The gross output figure is reported in the "matrix presentation of accounts".

(2,1) Commodities-Activities

Intermediate consumption of goods and services is also reported in the production account in the "matrix presentation of accounts".

(2,5) Commodities - Households: private consumption

Households expenditures for private consumption are taken directly from the use of disposable income account.

(2,6) Commodities – Government: state consumption

Government expenditures for final consumption are reported in the use of income account. According to SNA only two institutional sectors incur expenses on final consumption: households and government. Therefore there are two possible ways to reflect the transactions of NPISH: add them to the expenditures for final consumption of government or households. We use the first way because it corresponds to the macro aggregates of the final consumption accepted in the input-output tables, which is used for SAM disaggregation. So the value of transaction "commodity – government" is the sum of government and NPISH expenditures for final consumption.

(2,7) Commodities - Capital: gross capital formation

Gross fixed capital formation is the sum of consumption of fixed capital, change in inventories, acquisitions less disposals of valuables, and acquisitions less disposals of non-produced non-financial assets. It is reported by Goskomstat RF in the "matrix presentation of accounts".

(2,8) Commodities – The rest of the world: export

Aggregated export is also taken directly from the goods and services account.

(3,1) Factors– Activities: value added

This transaction in SAM represents gross value added less taxes on products. The value of the cell is calculated as sum of compensations of employees, gross operating surplus, gross mixed income, and other taxes less subsidies. The economic meaning of this transaction - income distributed between production factors in internal economy.

(3,8) Factors[11] – The rest of the world

[10] We use "commodities" and "products" as synonym as well as "activities" and "industries"

The entry includes factor income received from abroad – compensations of employees transferred from the rest of the world. The value of transaction is taken from the allocation of primary income account.

(4,3) Enterprises - Factors: gross profits

Gross profits of the economy include operating surplus and consumption of fixed capital. These flows come from the generation of income account.

(4,6) Enterprises - Government: transfers from government to enterprises

Transfers from government to enterprises include subsidies on products and other subsidies on production. They are documented in the allocation of primary income account for general government sector. Since macro aggregates in SAM include net taxes transactions dealing with tax transfers are also mapped also as net (taxes less subsidies), the entry (4,6) appears zero.

(4,8) Enterprises – The rest of the world: transfers to enterprises from abroad

The transaction includes transfers from the rest of the world to enterprises documented in rest of the world account. The data on distribution of income transferred from abroad among the institutional sectors is not available therefore income transfers from the rest of the world are conditionally referred to the sector of government.

(5,3) Households - Factors: compensations of employees and other benefits

Factor income of households is calculated as the sum of compensation of employees reported in the allocation of primary income account and gross mixed income, which is included in households income in full.

(5,4) Households - Enterprises: distributed profits and social security

The transaction includes transfers, distributed from enterprises to households. From the economic point of view this transaction includes profits distributed by enterprises to households. The data on profits distribution is not available, therefore the transaction is determined conditionally. The figure includes property income paid mainly by the sector of enterprises and received by households, and social transfers from enterprises to households (the allocation of primary income account).

(5,6) Households - Government: social security

The transaction includes social contributions, social benefits other than social transfers in kind, the last one refer to state consumption and other current transfers from government to households.

(5,8) Households – The rest of the world: foreign transfers to households

As specified above all the foreign transfers not identified unequivocally are attributed to the sector of government therefore the entry appears zero.

(6,1) Government - Activities: other taxes on production

The transaction of "activities" and "government" are recorded in the account of income generation as "other taxes less subsidies on production" included taxes on production and import. According to Goskomstat RF [Natsional'nye.., 2003, p. 14] taxes on production and import refer to compulsory, unrequited non-repayable payments levied by the general government on producers in connection with production or import of goods or use of factors of production. Taxes on production and import consist of taxes on products and other taxes on production. Taxes on

[11] The category of "factor income " is not used in SNA. We use it for convenience of description of the economic substance of the transaction relating to generation and distribution of income by categories of value added.

products are mapped in the cell (6,2), therefore this transaction includes other taxes on production, which refer to taxes associated with the use of factors of production (labor, land, capital) as well as payments for licenses and permissions to be engaged in certain activities or other compulsory payments which are necessary for production activities of residents. They do not include any taxes on profits or other income received by enterprises. Other taxes on production include: taxes on property of enterprises, allowances to road funds (except for the tax on fuel and lubricants), taxes on land, taxes on pollution, taxes levied on wage fund and some others. Taxes on import refer to imported goods and service, they are not allocated by Goskomstat RF separately, therefore they are included in the value of taxes on products. Taxes on production are also reported on the net basis, i.e. less other subsidies on production.

(6,2) Government - Commodities: taxes on products

The transaction of "commodities" and "government" are recorded in the production account as item "taxes less subsidies on products". Taxes on products refer to taxes levied proportionally to quantities or value of goods and services produced, sold or imported by the residents. They include value-added tax, excise duties, taxes on imported goods and services, etc. The figure is taken directly from the production account. Taxes on products are recorded on the net basis. dies.

(6,3) Government - Factors: factor incomes of government

Factor income is distributed to enterprises as gross operating surplus, to households as compensations of employees in internal economy and abroad, and to government. Gross operating surplus of general government, which is non-tax income of the government, is also included in this transaction.

(6,4) Government - Enterprises: taxes on enterprise income

The transaction includes all the transfers from enterprises to government, paid out from total income of enterprises. Government revenue from enterprises originating from both tax and non-tax sources is included. The figure involves current income taxes and property taxes, paid by enterprises, as well as other current transfers and property income transferred by enterprises to government[12]. In case of cross flows of other current transfers they are recorded on the net basis (i.e. amount paid less received).

Social contributions received by the sector of enterprises are also assumed to be received from the government and are subtracted from the total flow of transfers from enterprises to the government.

Conditionally this transaction also involves social transfers in kind transferred from non-profit institutions serving households to households. As it was mentioned above, macro aggregates in SAM refer to final consumption expenditures of households and government, rather than to actual final consumption, therefore social transfers in kind are included in final consumption of government and are mapped as transfers to government.

(6,5) Government - Households: income taxes

Transfers from households to government include current taxes on income, wealth, etc., as well as social contributions and other current transfers paid by households to government in the process of income redistribution. Besides this transaction includes property income redistributed from the sector of households, in relation to which it is also assumed, that property income received by households in excess of property expenditures is transferred to government.

[12] We had no data on distribution of property income, received by sector of enterprises, therefore it is conditionally assumed, that property incomes are transferred from enterprises to households in value equal to property income received by households. If value of transfer (data is shown in allocation of primary income account) is less than total property income received by enterprises then the surplus transferred to government.

(6,8) Government – The rest of the world: net transfers to government

This transaction conditionally involved all current transfers which cannot be allocated unequivocally to specific institutional sectors: property income, other current transfers received from abroad.

(7,4) Capital - Enterprises: enterprise savings and retained profit

Gross savings of enterprises are taken directly from the use of income account.

(7,5) Capital – Households: households savings

Gross savings of households are recorded in the use of income account.

(7,6) Capital - Government: savings of government

Gross savings of the government are also taken from the use of income account.

(7,8) Capital – The rest of the world: capital transfers abroad

The transaction includes capital transfers received (+)/paid (-) and acquisitions less disposals of non-produced assets that allows to close the capital account. We used the approach recommended by SNA when received and paid capital transfers to and from abroad are recorded net that allows to record the macroeconomic aggregate "net lending (+)/ net borrowing (-) of the economy as a whole " in the cell (8,7).

(8,2) The rest of the world - Commodities: import of goods and services

Data on aggregated import is documented in the goods and services account.

(8,3) The rest of the world - Factors: transfer of factors income abroad

Data on compensations of employees transferred abroad is obtained from the allocation of primary income account.

(8,6) The rest of the world - Government: government transfers abroad

Transaction of government with the rest of the world involves all income transfers abroad, except compensations of employees and capital transfers, therefore the figure is the sum of property income, social benefits, except social transfers in kind, and other current transfers abroad.

(8,7) The rest of the world - Capital: net lending / net borrowing

As specified above the transaction records a balancing item of capital account and one of the main macroeconomic aggregates “net lending (+)/ net borrowing (-) of the economy as a whole".

ANNEX2. SAM FOR RUSSIA FOR 1995-2001

TABLE A1. AGGREGATED SAM FOR 1995 (in million roubles)

		1	2	3	4	5	6	7	8		10
		activities	commodities	factors	enterprises	households	government	capital acct	ROW	errors	total
1	activities	0	2784496							0	2784496
2	commodities	1364434				759955	335866	391589	426736	-60	3278520
3	factors	1358179							759		1358938
4	enterprises			423551							423551
5	households			883401	65596		136691				1085688
6	government	61883	120431	49841	163223	179207			21635		596220
7	capital acct				194732	146526	88126		-1592	60	427852
8	ROW		373593	2145			35537	36263			447538
10	total	2784496	3278520	1358938	423551	1085688	596220	427852	447538	0	10402803

TABLE A2. AGGREGATED SAM FOR 1996 (in million roubles)

		1	2	3	4	5	6	7	8	9	10
		activities	commodities	factors	enterprises	households	government	capital acct	ROW	errors	total
1	activities		3831831								3831831
2	commodities	1868664				1056059	488600	528695	532239	-17122	4457135
3	factors	1854994							540		1855534
4	enterprises			465379							465379
5	households			1315721	83282		226248				1625251
6	government	108173	182489	71836	147893	298010			24855		833256
7	capital acct				234205	271182	68225		-2336	17121	588397
8	ROW		442815	2598			50183	59702			555298
10	total	3831831	4457135	1855534	465380	1625251	833256	588397	555298	-1	14212081

TABLE A3. AGGREGATED SAM FOR 1997 (in million roubles)

		1	2	3	4	5	6	7	8	9	10
		activities	commodities	factors	enterprises	households	government	capital acct	ROW	errors	total
1	activities		4437044								4437044
2	commodities	2173774				1265468	626379	564244	592333	-50950	5171248
3	factors	2119896							1314		2121210
4	enterprises			507010							507010
5	households			1532419	33101		296977				1862497
6	government	143374	215324	78491	197174	368489			26059		1028911
7	capital acct				276735	228540	30172		-4579	50950	581818
8	ROW		518880	3290			75383	17574			615127
10	total	4437044	5171248	2121210	507010	1862497	1028911	581818	615127	0	16324865

TABLE A4. AGGREGATED SAM FOR 1998 (in million roubles)

		1	2	3	4	5	6	7	8	9	10
		activities	commodities	factors	enterprises	households	government	capital acct	ROW	errors	total
1	activities		4620507								4620507
2	commodities	2118896				1498662	602001	443978	840597		5504134
3	factors	2325475							3156		2328631
4	enterprises			638193							638193
5	households			1629187	85489		277557				1992233
6	government	176136	239440	57327	143297	395915			31903		1044018
7	capital acct				409407	97656	14846		-5331		516578
8	ROW		644187	3924			149614	72600			870325
9	errors										0
10	total	4620507	5504134	2328631	638193	1992233	1044018	516578	870325	0	17514619

TABLE A5. AGGREGATED SAM FOR 1999 (in million roubles)

	1999	1	2	3	4	5	6	7	8	9	10
		activities	commodities	factors	enterprises	households	government	capital acct	ROW	errors	total
1	activities		8126010								8126010
2	commodities	3854535				2520066	760282	700681	2086739	-38582	9883721
3	factors	4001458							10464		4011922
4	enterprises			1482629							1482629
5	households			2486030	176897		354158				3017085
6	government	270017	495360	38236	434034	554642			113871		1906160
7	capital acct				871696	-57623	496885		-10871	38582	1338669
8	ROW		1262351	5027			294835	637990			2200203
10	total	8126010	9883721	4011922	1482627	3017085	1906160	1338671	2200203	0	31966399

TABLE A6. AGGREGATED SAM FOR 2000 (in million roubles)

	2000	1	2	3	4	5	6	7	8	9	10
		activities	commodities	factors	enterprises	households	government	capital acct	ROW	errors	total
1	activities		12552211								12552211
2	commodities	6080013				3295237	1181614	1365734	3218866		15141464
3	factors	6057161							14047		6071208
4	enterprises			2375391							2375391
5	households			3641798	236482		514690				4392970
6	government	415037	833448	47471	552603	862913			142908		2854380
7	capital acct				1586306	234820	820500		300096		2941722
8	ROW		1755805	6548			337576	1575988			3675917
10	total	12552211	15141464	6071208	2375391	4392970	2854380	2941722	3675917	0	50005263

TABLE A7. AGGREGATED SAM FOR 2001 (in million roubles)

		1	2	3	4	5	6	7	8	9	10
		activities	commodities	factors	enterprises	households	government	capital acct	ROW	errors	total
1	activities		16085202								16085202
2	commodities	8140445				4321125	1575712	1989030	3280420		19306732
3	factors	7643371							18189		7661560
4	enterprises			2850465							2850465
5	households			4726978	254058		747569				5728605
6	government	301386	1094684	69714	636669	1047110			190408		3339971
7	capital acct				1959739	360370	684843		-273750		2731202
8	ROW		2126846	14403			331845	742173			3215267
10	total	16085202	19306732	7661560	2850466	5728605	3339969	2731203	3215267	9.31E-10	60919004