Three-Sector Structure of the National Economy of Russia

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Abstract

The main objective of the article is to determine the changes in the income and expenditure of the national economy of Russia from 1961 to 2009. To solve this problem, the author applied research methodology of the economic system - a three-sector static equilibrium income and expenses using a statistical system of national accounts. As a result, on the basis of the methodology found an association between income and expenditure of the three sectors (economic activities) of the national economy: the production of products and services for production purposes, the production of consumer goods and production of financial and credit services.

Keywords: static equilibrium in the economy, the structure of the national economy, sectors of economy, gross domestic product, income and expenses.

1. Introduction

The most important principle of positive functioning of the economic system is a balance: between production and consumption, trade and monetary circulation, aggregate supply and demand; revenues and expenditures; material and personal factors of production, consumption and accumulation; sectors producing capital and consumer goods, manufacturing products and providing services, transformational and transactional sectors, exports and imports, trade and balance of payments and other areas of economic life. Under equilibrium author understood balanced interaction (transaction) between the separate spheres of the national economy, contributing to its growth.

Methodological principle of equilibrium in the study of the economic system has led many scientists to develop various static models of economic development. During the XX century, many economists analyzed the problem of static economic system. Most scientists understand economic statics as equilibrium theory of national economy or static economy, that is economy in a state of equilibrium [Schumpeter J. 1908; Schumpeter J., 1912], [Jevons St. W, 1911], [Walras L., 1988], [Marshall A., 1910], [Clark J.B, 1899; Clark J.B, 1922], [Pareto V., 1909], [Fisher I., 1892], [Seligman E., 1905], [Tanssig F., 1923], [Cassel G., 1918], [Oppenheimer Fr., 1922; Oppenheimer Fr., 1911], [Streller R., 1926], [Badge S., 1925]. Analysis of the economic problems in normal conditions, that is in equilibrium is static in nature.

Consideration of the equilibrium state of the economic system has led scientists to study the interaction of individual elements of which it is composed. Study of equilibrium of the economic system means designing circuits for establishing equilibrium of its elements. The main objective is the optimal economic statics analysis of the structure and interaction of the elements of the national economy, the achievement of the overall proportion and balance of the economy.

2. The Equilibrium Structure of the National Economy of Russia on Income and Expenditure

The national economy is characterized by many macroeconomic indicators, but most important of which are the gross output of products and services (GO) gross domestic product (GDP), the accumulation of real and financial assets, net lending (+) / net borrowing (-). The above macroeconomic indicators are interrelated with each other. If the absolute value of GDP taken for 10,000 currency units or 10000 0/00, in a formalized way, gross output of products and services can be represented by the following equation:

\[ c (c + c') + v + m = w, \]

where: \( w \) - gross output at market prices; \( c' \) - material costs or intermediate consumption; \( c'' \) - depreciation (depreciation cost of capital); \( v \) - workers wages (including taxes and insurance deductions, hidden wages); \( m \) - gross...
profit and net mixed income (including taxes on products, net taxes on production and non-tax payments).

We have calculated the structure of gross output and gross domestic product of Russia for 50 years (for the period from 1961 to 2009). The resulting calculations for some years can be summarized as follows:

1961 year: 11306c + 4484v + 4110m = 20200w
1970 year: 11884c + 4554v + 4235m = 20673w
1982 year: 12177c + 4363v + 3945m = 20485w
1991 year: 9857c + 4367v + 418vm = 19042w
2008 year: 9379c + 4562v + 4775m = 18716w
2009 year: 9826c + 4574v + 3932m = 18934w

Gross domestic product at market prices is defined as the difference between gross output at market prices (w) and intermediate consumption (c''), for example, in 2009: 18934w - 8934c'' = 10000vvp.

where: vvp - gross domestic product at market prices (actual).

The resulting calculations for some years can be summarized as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross output w</th>
<th>Intermediate consumption c'</th>
<th>Gross domestic product vvp</th>
<th>Gross fixed capital formation (c''+Δc')</th>
<th>Change in working material capital c''</th>
<th>Final consumption expenditure (v+Δv)</th>
<th>Rest of the money (the difference of income and transfers) o</th>
<th>Net lending (+) / net borrowing (-) m/x</th>
<th>Statistical discrepancy r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2(3+4)</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1961</td>
<td>20200</td>
<td>10200</td>
<td>10000</td>
<td>1597</td>
<td>417</td>
<td>8028</td>
<td>*</td>
<td>58</td>
<td>-100</td>
</tr>
<tr>
<td>1970</td>
<td>20673</td>
<td>10673</td>
<td>10000</td>
<td>2028</td>
<td>390</td>
<td>7524</td>
<td>*</td>
<td>71</td>
<td>-13</td>
</tr>
<tr>
<td>1982</td>
<td>20485</td>
<td>10485</td>
<td>10000</td>
<td>2471</td>
<td>459</td>
<td>6909</td>
<td>-50</td>
<td>129</td>
<td>82</td>
</tr>
<tr>
<td>1991</td>
<td>19042</td>
<td>9042</td>
<td>10000</td>
<td>2323</td>
<td>1301</td>
<td>6119</td>
<td>*</td>
<td>28</td>
<td>229</td>
</tr>
<tr>
<td>1998</td>
<td>18331</td>
<td>8331</td>
<td>10000</td>
<td>1615</td>
<td>-119</td>
<td>7620</td>
<td>468</td>
<td>199</td>
<td>217</td>
</tr>
<tr>
<td>1999</td>
<td>18242</td>
<td>8242</td>
<td>10000</td>
<td>1439</td>
<td>44</td>
<td>6812</td>
<td>387</td>
<td>1318</td>
<td>0</td>
</tr>
<tr>
<td>2006</td>
<td>18716</td>
<td>8716</td>
<td>10000</td>
<td>2192</td>
<td>361</td>
<td>6537</td>
<td>309</td>
<td>602</td>
<td>-1</td>
</tr>
<tr>
<td>2009</td>
<td>18934</td>
<td>8934</td>
<td>10000</td>
<td>2144</td>
<td>-271</td>
<td>7466</td>
<td>431</td>
<td>304</td>
<td>-74</td>
</tr>
</tbody>
</table>

Symbols in the table: * - statistics for that year are not available.
Based on the structure of Russia's GDP, we can write the equation of exchange or balance income and expenditure, for example on the following data:

1961 year: \(1106c' + 4484v + 4410m(1989n' + 41n'' + 2380p) = 417\Delta c' + 1597(c'' + \Delta c') + 8028(v + \Delta v) + 58m/x + 100r;\)

1970 year: \(1211c'' + 4554v + 4235m(1306n' + 107n'' + 28226p) = 390\Delta c' + 2028(c'' + \Delta c') + 7524(v + \Delta v) + 71m/x + 13r;\)

1982 year: \(1692c'' + 4363v + 3945m(1865n' + 113n'' + 1967p) = 459\Delta c' + 2471(c'' + \Delta c') + 6909(v + \Delta v) + 129m/x - 50o + 82r;\)

1991 year: \(815c'' + 4367v + 3945m(1865n' + 113n'' + 1967p) = 1301\Delta c' + 2323(c'' + \Delta c') + 6119(v + \Delta v) + 28m/x + o + 229r;\)

2008 year: \(663c'' + 4562v + 4775m(1508n' + 514n'' + 2753p) = 361\Delta c' + 2192(c'' + \Delta c') + 6537(v + \Delta v) - 1m/x + 602o + 309r;\)

2009 year: \(894c'' + 5174v + 3932m(1254n' + 390n'' + 2280p) = - 271\Delta c' + 2144(c'' + \Delta c') + 7466(v + \Delta v) - 74m/x + 304o + 431r.\)

3. Sector Research Methodology of the Economic System

The modern world and the national economy dividing into markets, areas, scopes, industry activities, sector institutional units and other segments. An important methodological principle study of the global economy is a sector specific approach, which is a form of expression system methodology. Not by chance the world economic theory has practical realization in the development of an international system of national accounts, in which the initial and basic categories are sector institutional unit and type of economic activity.

World economic science is on the long road from research transactions between two units of social reproduction (by K.Marx), between the three departments of production and consumption (by M.I. Tugan-Baranovsky) between the sectors producing capital and consumer goods, savings and investment, aggregate demand and supply (by D. Keyns) between transformational and transactional sectors of the national economy (by D. North and J. Wallis) and the transition to the study of mega transactions between the real and financial sectors of the world economy and between different segments of the global economic system (production and consumption, saving and accumulation, etc.). With the help of statistical data of the international system of national accounts recorded inter sector transactions (from Latin transaction means interaction) undertaken in the global and national economic system. The author of the article was made division of the national economy in the context of the three groups of industries (sectors): industries producing capital goods and production services to organizations (W1); industries producing consumer goods and services to the public (W2) and industries, rending financial services (banking, insurance, investment and other) to organizations and people (W3) (Table 2).

Table 2: The revenues from the implementation of the gross output of products and services in the context three sectors of the Russian economy (for the period from 1998 to 2009).

<table>
<thead>
<tr>
<th>Year</th>
<th>W1</th>
<th>W2</th>
<th>W3</th>
<th>W</th>
<th>W</th>
<th>W</th>
<th>W</th>
<th>W</th>
<th>W</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>10209</td>
<td>8879</td>
<td>2846</td>
<td>1637</td>
<td>1209</td>
<td>121</td>
<td>1878</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>7916</td>
<td>8358</td>
<td>272</td>
<td>808</td>
<td>536</td>
<td>94</td>
<td>7916</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>206</td>
<td>210</td>
<td>4</td>
<td>10</td>
<td>-6</td>
<td>2</td>
<td>206</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Gross domestic product may also be represented by final use. Feature of this method is that the distribution and redistribution of income is used by institutional units to the ultimate goals of consumption and accumulation. Define their constituent elements and the actual quantity. Then was calculated element structure of gross output and gross domestic product of Russia by end-use in the context of the three products sectors for the period 1998 to 2009 (Table 3).

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross output</th>
<th>Consumption of products and services by organizations of the group I industries (sector A)</th>
<th>Consumption of products and services by organizations of the group II industries or the final con-sumption expend-itures of the population (sector B)</th>
<th>Consumption of products and services by organizations of the group III industries (sec-tor C) or net lending (+) or net bor-ro-wing(-)</th>
<th>Cash balan-ces of money “Idle money” o</th>
<th>statis-tical dis-crep-ancy r</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>18331</td>
<td>8879w11(c1+v1+m1)+1209[w21(c2+v2+m2)-w22(c2+v2+m2)]+121r1=10209w1</td>
<td>1873</td>
<td>10807</td>
<td>7620</td>
<td>199</td>
</tr>
<tr>
<td>1999</td>
<td>18242</td>
<td>8358w21(c2+v2+m2)-536[w22(c2+v2+m2)]-w23(c2+v2+m2)+94r2 = 7916w2</td>
<td>1873</td>
<td>10807</td>
<td>6812</td>
<td>1318</td>
</tr>
<tr>
<td>2000</td>
<td>18322</td>
<td>210w31(c3+v3+m3)-6[w32(c3+v3+m3)]-10w33(c3+v3+m3)]+2r3 = 206w3</td>
<td>1873</td>
<td>10807</td>
<td>6218</td>
<td>2157</td>
</tr>
<tr>
<td>2001</td>
<td>19031</td>
<td>17447w4(c4+v4+m4)+667[w2(c2+v2+m2)]-w3(c3+v3+m3)]+217r3 = 18331w4</td>
<td>1873</td>
<td>10807</td>
<td>6582</td>
<td>797</td>
</tr>
<tr>
<td>2002</td>
<td>18687</td>
<td>18884</td>
<td>8884</td>
<td>2426</td>
<td>11310</td>
<td>6580</td>
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<tr>
<td>2003</td>
<td>18792</td>
<td>210w31(c3+v3+m3)-6[w32(c3+v3+m3)]-10w33(c3+v3+m3)]+2r3 = 206w3</td>
<td>1873</td>
<td>10807</td>
<td>6873</td>
<td>799</td>
</tr>
<tr>
<td>2004</td>
<td>18601</td>
<td>8601</td>
<td>2088</td>
<td>10868</td>
<td>6688</td>
<td>969</td>
</tr>
<tr>
<td>2005</td>
<td>18582</td>
<td>8582</td>
<td>2006</td>
<td>10658</td>
<td>6621</td>
<td>937</td>
</tr>
<tr>
<td>2006</td>
<td>18685</td>
<td>8685</td>
<td>2137</td>
<td>10822</td>
<td>6553</td>
<td>962</td>
</tr>
<tr>
<td>2007</td>
<td>18804</td>
<td>8844</td>
<td>2426</td>
<td>11310</td>
<td>6580</td>
<td>517</td>
</tr>
<tr>
<td>2008</td>
<td>18716</td>
<td>8716</td>
<td>2553</td>
<td>11269</td>
<td>6537</td>
<td>602</td>
</tr>
<tr>
<td>2009</td>
<td>18934</td>
<td>8934</td>
<td>1873</td>
<td>10807</td>
<td>7466</td>
<td>304</td>
</tr>
</tbody>
</table>

4. Results

Let’ refer to the data in Tables 2 and 3. The calculated data of the tables allow to formalize the exchange of goods in the three sectors of the natural-real and monetary terms, as well as to balance income and expenditure in the national economy. As an example, we use the appropriate values for the year 1998.

Total revenues from the sale of the gross output of the three sectors were:

\[
\text{I. } 8879w11(c1+v1+m1)+1209[w21(c2+v2+m2)]+121r1=10209w1
\]

\[
\text{II. } 8358w21(c2+v2+m2)-536[w22(c2+v2+m2)]+94r2 = 7916w2
\]

\[
\text{III. } 210w31(c3+v3+m3)-6[w32(c3+v3+m3)]+2r3 = 206w3
\]

Total expenditure on final consumption of products and services sectors accounted for three (I+II+III): 18331w = 9827w1[8331c'+ 1496(c'+\Delta c + \Delta \Delta c')] + \theta 7620w2(v+\Delta v) + 199w3(m/x) + 4680 + 217r

Hence we can write the system of equations of revenues and expenses and natural-real value for the year 1998:

\[
\text{I. } 8879w11(c1+v1+m1)+1209[w21(c2+v2+m2)]+121r1=10209w1
\]

\[
\text{II. } 8358w21(c2+v2+m2)-536[w22(c2+v2+m2)]+94r2 = 7916w2
\]

\[
\text{III. } 210w31(c3+v3+m3)-6[w32(c3+v3+m3)]+2r3 = 206w3
\]
5. Conclusion

Transactional approach to the study of the economic system revealed the real and natural-cash proportion and balance between incomes and expenses in the three major sectors of the national economy: the sector producing capital goods and industrial services providing to organizations (sector B), sector producing consumer goods and providing services to population (sector A) and sector providing financial services to organizations and population (sector C). Figure 1 presents data on the percentage of sectors A, B and C in a total volume of Russia’s GDP (in percent).

![Graph showing the percentage of sectors A, B, and C in Russia's GDP](image)

**Fig. 1.** Share of sectors A, B and C in the consumption of Russia's GDP.

Indicators (Table 3 and Figure 1) shows, that the financial sector has a small share in the national economy. Consequently, there is a decline in the share of the financial sector in the national economy of Russia.

References
