Task

The task was to analyze Russian consumer market and to develop a medium range forecast for its main aggregated consistent parts:

- Retail turnover of food and nonfood goods;
- Volume of public catering;
- Volume of paid services to the population, including.

Additional task was to analyze structure of commodity resources of retail trade, that means investigating of aggregate shares of domestically produced goods and goods arrived from abroad in total private consumption.

Approach

We know that there are few formal requirements showed to demand functions. The general form of the functions usually applied is a kind of the following:

$$
\frac{C_i}{P_i} = a_0 \left( \frac{Y}{\bar{P}} \right)^a \prod_k (P_k)^{b_k},
$$

where $C_i$ - expenditures for product $i$, $\bar{P}$ - average price index usually CPI, $Y$ - income in the current prices, $P_k$ - price index for product $k$, $a_0, b_k$ - parameters to be estimated. These last parameters provide complementarity and substitution among the different goods in the function. However it is well known that the main problem is to estimate so large quantity of parameters.

In our work we used the following simplified form of the function:

$$
\frac{C_i}{P_i} = a_0 \left( \frac{Y}{\bar{P}} \right)^a \left( \frac{P_i}{\bar{P}} \right)^b,
$$

The use of relative prices $P_i / \bar{P}$ allows us to estimate only three parameters, where $a$ and $b$ are income and price elasticities correspondingly.

It is need to remember about the properties defined by this form. Clearly, that $b$ for all goods must be negative. If to assume that $\bar{P}$ is a weighted average from a complete set of $P_i$, such simple form leaves only substitution and implies the absence
of complementarity among the different goods. However in the particular case of dealing with large commodity aggregated measures such assumption seems to be quite acceptable and justified. In fact it is not easy to find complementarity between consumption of food and industrial goods and services.

This form also can’t take into account income distribution changes.

For convenient estimation the function was transformed by using logarithms to linear form:

\[ \log(C_i / P_i) = a_0 + a \log(Y / \bar{P}) + b \log(P_i / \bar{P}). \]

**Import share forecasting approach**

The parity of shares of domestic and import production in the internal consumer market depends mainly on competitiveness of production. Competitiveness, obviously, in many respects is determined by the production factors expressed at the consumer market as quality of the offered goods. However in view of that macroeconomic technological and structural shifts in manufacture have long-term character, short term dynamics of import share is with other things staying equal determined by relative change of parity between domestic and import prices. With assumption of the world prices to be constant this parity for aggregated import share depends on changes of a real rouble exchange rate.

According to this approach the equation for estimation was the following:

\[ I^R / C^R = a_0 (RR)^b, \]

where \( I^R \) – import in real terms, \( C^R \) – Volume of retail turnover in real terms, \( RR = CPI/rateusd \) – real rouble exchange rate, \( a_0, b \) – parameteres to be estimated. Lack of data does not allow studying more detailed commodity groups.

**Data.** We used time series for the period of 4th quarter of 1998 to 1st quarter of 2006. This implies the assumption that elasticities would be constant during the whole time period in view.

The starting date for estimation was chosen as first quarter of 1999. The reason is that financial crisis and drastic national currency devaluation have taken place in 1998 in Russia.
The results of estimation of named above equations occurred to correspond to beforehand expectations.

**Food**

\[ r_{\text{Rintradefl}} = R_{\text{Rexpgoodsr,PIfpcl}} \]

\[
\begin{align*}
\text{SEE} &= 0.03 \quad \text{RSSQ} = 0.9840 \quad \text{RHO} = -0.02 \\
\text{Obser} &= 29 \quad \text{from} \quad 1999.100
\end{align*}
\]

\[
\begin{align*}
\text{SEE}+1 &= 0.03 \quad \text{RBSQ} = 0.9828 \quad \text{DW} = 2.04 \\
\text{DoFree} &= 26 \quad \text{to} \quad 2006.100
\end{align*}
\]

MAPE = 0.34

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Reg-Coeff</th>
<th>Mexval</th>
<th>Elas</th>
<th>NorRes</th>
<th>Mean</th>
<th>Beta</th>
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<td>1.19</td>
<td>1.03</td>
<td>6.38</td>
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<td>3 PIfpcl</td>
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<td>1.5</td>
<td>0.35</td>
<td>1.00</td>
<td>-4.61</td>
<td>-0.022</td>
</tr>
</tbody>
</table>

Food prices 1998.4

The fit is fairly well. The meaning of Rsquare is high enough and Darbin-Watson is also satisfactory. Low relative price elasticity is not reasonable. Actually food is the matter of first necessity and has low substitution property. From the income elasticity it is clear that population would still be ready to eat more if income allowed and visa versa.

By the way similar estimations for the period of middle 1990-th gave large reasonable elasticity for prices. It was the hard time for the people when they compelled to have large share of their foodstuff in natural form from their part-time small farms.
Nonfood

\[ r \text{ Rintradenfl} = \text{Rexpgoods1,PInpcl[1]} \]

<table>
<thead>
<tr>
<th>Variable name</th>
<th>Reg-Coef</th>
<th>Mexval</th>
<th>Elas</th>
<th>NorRes</th>
<th>Mean</th>
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Nonfood prices 1998.4

Formal indicators here are acceptable. Income elasticity shows that industrial goods purchases change more rapidly (about 30%) than personal income does. On condition of growing personal income it means that the share of nonfood purchases will enlarge. It is possible to suppose that people would like to buy even more than they earn. Relative prices are of small importance so it leaves no substitution to services. However people seemed to pay more attention to prices of nonfood commodities.

Public catering

\[ r \text{ Rcatering1} = \text{Rexpgoods1,PIcaterpcl} \]

Public catering
The results for catering correspond to weak development of this sector in Russia. Income elasticity demonstrates the conservative character of the sector in view. Together with insignificant price factor it says that feasible catering is available for the people with more or less high incomes and they consider catering as a kind of necessity.

**Services**

\[
\text{Rin} = \text{Rexpoodsl, PIservicepc1} 
\]

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**Services**

\[
\text{Rin} = \text{Rexpoodsl, PIservicepc1} 
\]
The time series for services were inconsistent, that’s why the time period for estimation was taken shorter. Law meanings for both income and price elasticities for services may be explained in following way. The total aggregate measure for services is internally inconsistent and contradictive. About half of the volume of services is aimed to provide peoples existence. They are housing, transportation to the place of work and back, services of user's communication. As a matter of fact, these kinds of services are not activity to order in Russia, their offer actually does not depend on a consumer demand. Let me say it is somewhat like a kind of a tax.

**Consumer import share**

\[
\begin{align*}
    \text{SEE} &= 0.07 \\
    \text{RSQ} &= 0.8691 \\
    \text{RHO} &= 0.05 \\
    \text{Obser} &= 25 	ext{ from 2000.100} \\
    \text{SEE+1} &= 0.07 \\
    \text{RBSQ} &= 0.8634 \\
    \text{DW} &= 1.90 \\
    \text{DoFree} &= 23 	ext{ to 2006.100} \\
    \text{MAPE} &= 14.53
\end{align*}
\]

<table>
<thead>
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<th>Variable name</th>
<th>Reg-Coef</th>
<th>Mexval</th>
<th>Elas</th>
<th>NorRes</th>
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<tr>
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<td>-3.01</td>
<td>1.00</td>
<td>1.95</td>
<td>0.932</td>
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Consumer import share
prices 1998.4

Elasticity for real rouble exchange rate less than 1 tells us that import share growth fall behind real rouble exchange rate growth. Hope it to be true. Soon we shall see what it will turn in.

Here below there are some results of this simple forecast.

<table>
<thead>
<tr>
<th>Table1</th>
<th>PCE growth rates, prices 1998.4, %</th>
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</thead>
<tbody>
<tr>
<td>Retail turnover</td>
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<td>Food</td>
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<td>Services</td>
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<td>GDP</td>
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The cost for the high growth rates for private consumption expenditures on condition of low growth rates for GDP in future is a large import share in purchases.