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Medium range perspective for Russian consumer market

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:

$$C_i / P_i = a_0 (Y / \overline{P})^a \prod_k (P_k)^{bk},$$

where C_i –expenditures for product i, $\overline{P}$ - 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 comlementarity 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:

$$C_i / P_i = a_0 (Y / \overline{P})^a (P_i / \overline{P})^b,$$

The use of relative prices $P_i / \overline{P}$ 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 $\overline{P}$ is a weighted average from a complete set of P_i, such simple form leaves only substitution and implies the absence

of comlementarity 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:

$$log(C_i / P_i) = a_0 + a\ log(Y / \overline{P}) + b\ log(P_i / \overline{P}).$$

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_k – 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 Rintradefl = Rexpgoodsl,PIfpcl
:                                   Food
  SEE   =       0.03 RSQ  = 0.9840 RHO =  -0.02 Obser  =   29 from 1999.100
  SEE+1 =       0.03 RBSQ = 0.9828 DW  =   2.04 DoFree =   26 to   2006.100
  MAPE  =       0.34
    Variable name        Reg-Coef  Mexval  Elas   NorRes    Mean   Beta
  0 Rintradefl           - - - - - - - - - - - - - - - - -   5.38 - - -
  1 intercept            -2.86891      3.4  -0.53   62.47    1.00
  2 Rexpgoodsl            1.00087    683.2   1.19    1.03    6.38  0.995
  3 PIfpcl               -0.40434      1.5   0.35    1.00   -4.61 -0.022
```
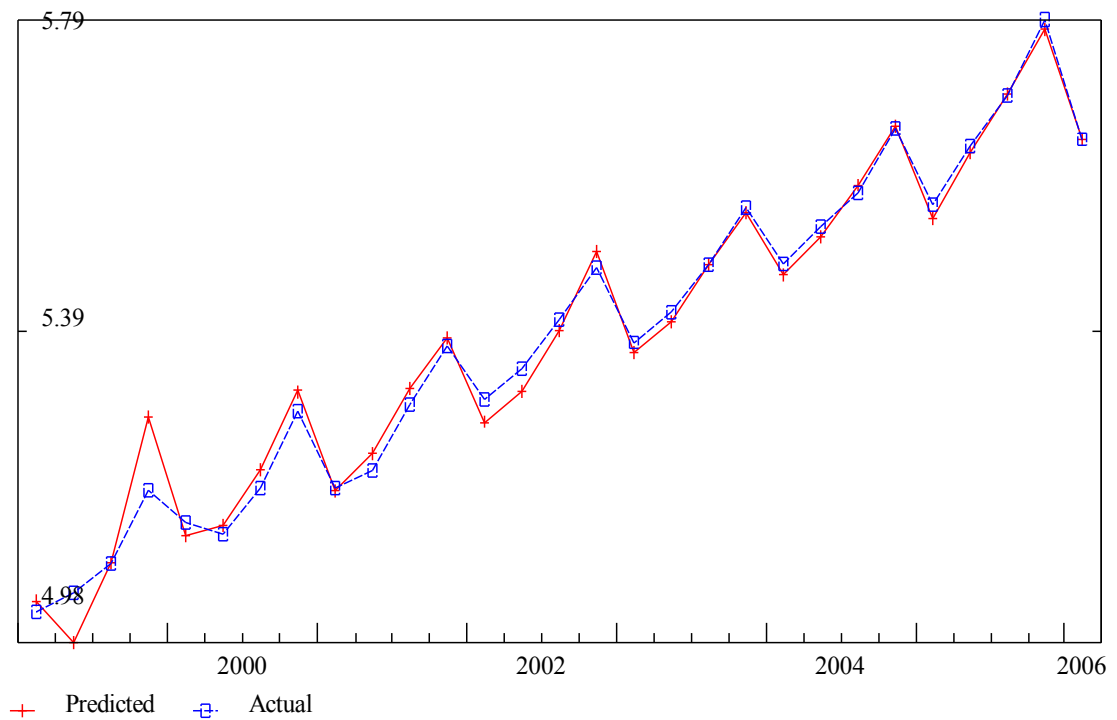

Food

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 Rintradenfl = Rexpgoodsl,PInfpcl[1]
:                              Nonfood
  SEE   =       0.03 RSQ  = 0.9834 RHO =   0.03 Obser  =   28 from 1999.200
  SEE+1 =       0.03 RBSQ = 0.9821 DW  =   1.94 DoFree =   25 to   2006.100
  MAPE  =       0.48
    Variable name       Reg-Coef  Mexval  Elas   NorRes     Mean  Beta
  0 Rintradenfl         - - - - - - - - - - - - - - - - -    5.56 - - -
  1 intercept           -7.39127    22.8  -1.33   60.39      1.00
  2 Rexpgoodsl           1.28815   676.0   1.48    1.21      6.39  0.990
  3 PInfpcl[1]          -1.02420    10.0   0.85    1.00     -4.61 -0.059
```
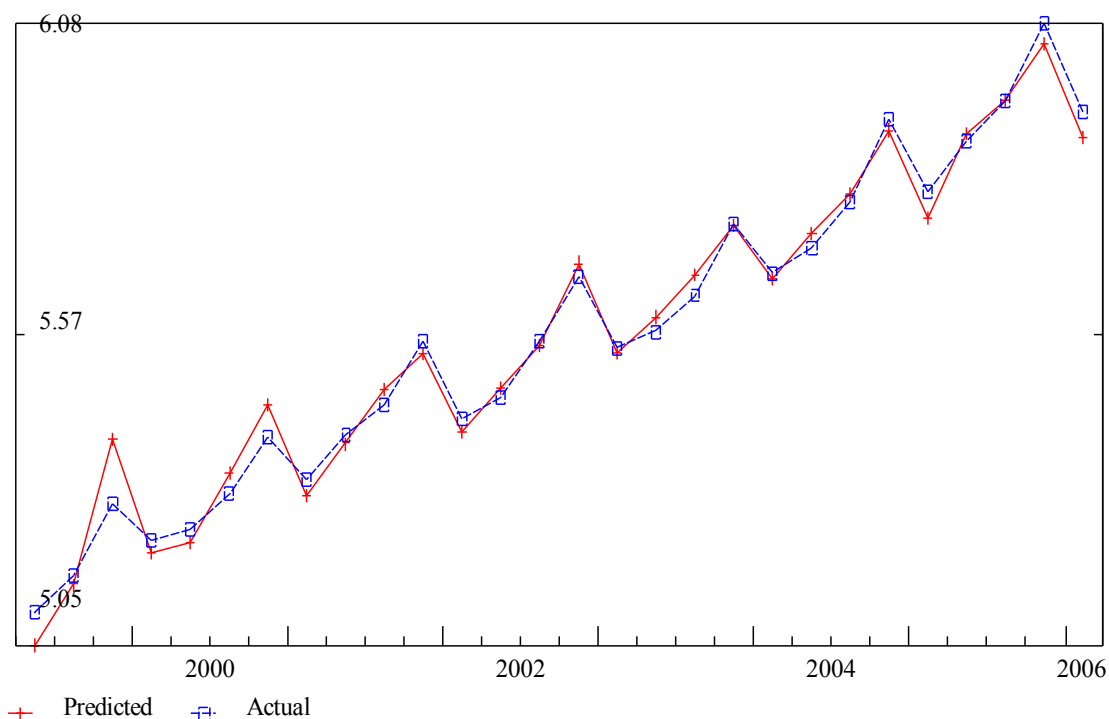
Nonfood

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 Rcateringl = Rexpgoodsl,PIcaterpcl
:                              Public catering
```
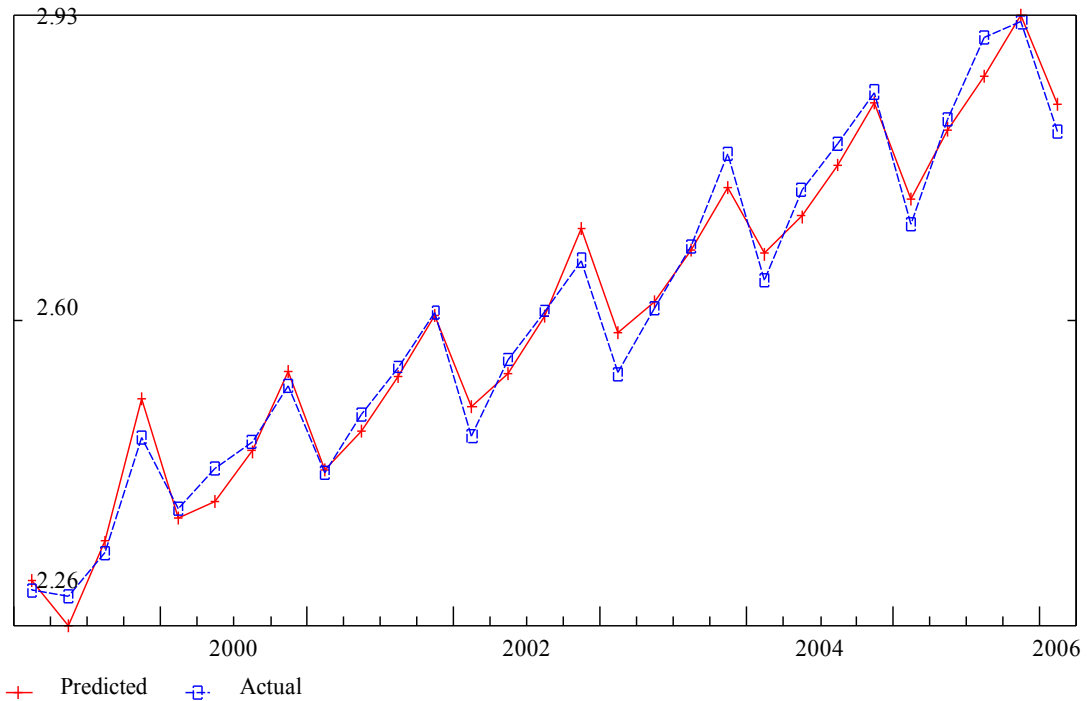
```
SEE   =        0.02 RSQ  = 0.9804 RHO =   0.05 Obser  =   29 from 1999.100
SEE+1 =        0.02 RBSQ = 0.9789 DW  =   1.91 DoFree =   26 to   2006.100
MAPE  =        0.81
  Variable name        Reg-Coef Mexval Elas   NorRes    Mean  Beta
0 Rcateringl           - - - - - - - - - - - - - - - -   2.60 - - -
1 intercept            -3.27297   29.5  -1.26   50.99    1.00
2 Rexpgoodsl            0.85008  603.4   2.09    1.01    6.38  0.988
3 PIcaterpcl           -0.09766    0.6   0.17    1.00   -4.59 -0.016
```

Public catering

prices 1998.4

+ Predicted   □ Actual

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.
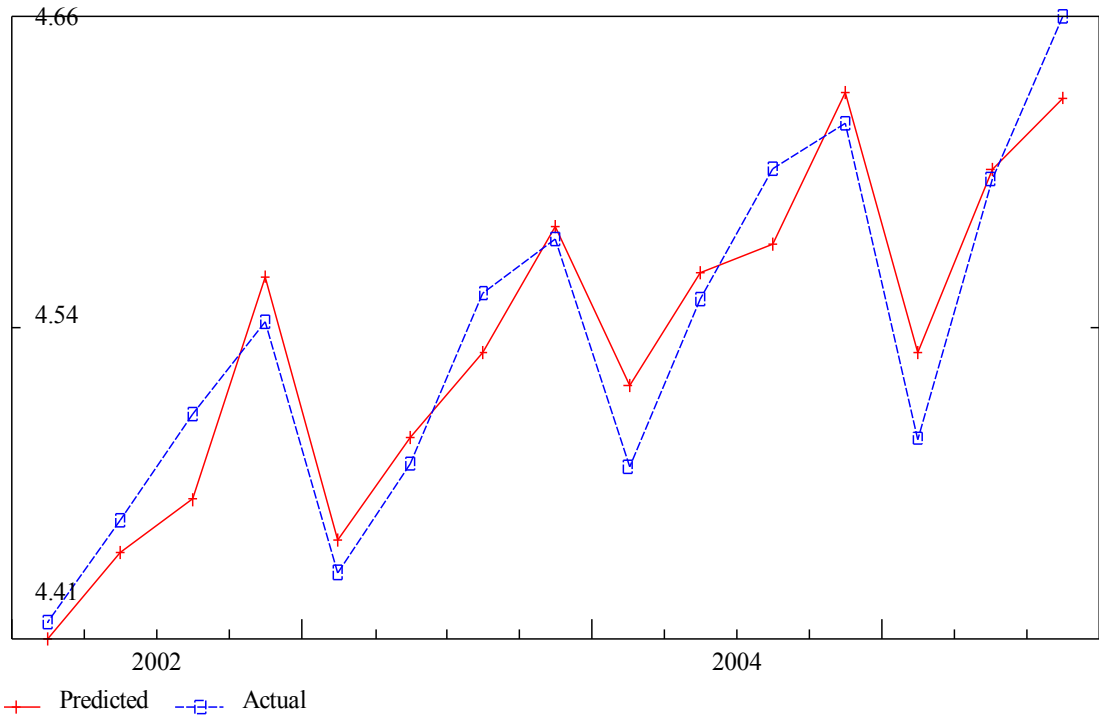
Services

```
r Rinservicel= Rexpgoodsl,PIservicepcl
:                               Services
  SEE   =        0.02 RSQ  = 0.8974 RHO =   0.10 Obser  =   15 from 2002.100
  SEE+1 =        0.02 RBSQ = 0.8803 DW  =   1.79 DoFree =   12 to   2005.300
  MAPE  =        0.42
    Variable name        Reg-Coef Mexval Elas   NorRes    Mean  Beta
0 Rinservicel          - - - - - - - - - - - - - - - -   4.53 - - -
1 intercept            -1.15755    3.8  -0.26    9.75    1.00
2 Rexpgoodsl            0.43693  115.4   0.63    1.34    6.49  0.781
3 PIservicepcl         -0.62306   15.6   0.63    1.00   -4.58 -0.238
```

Services

prices 1998.4

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.
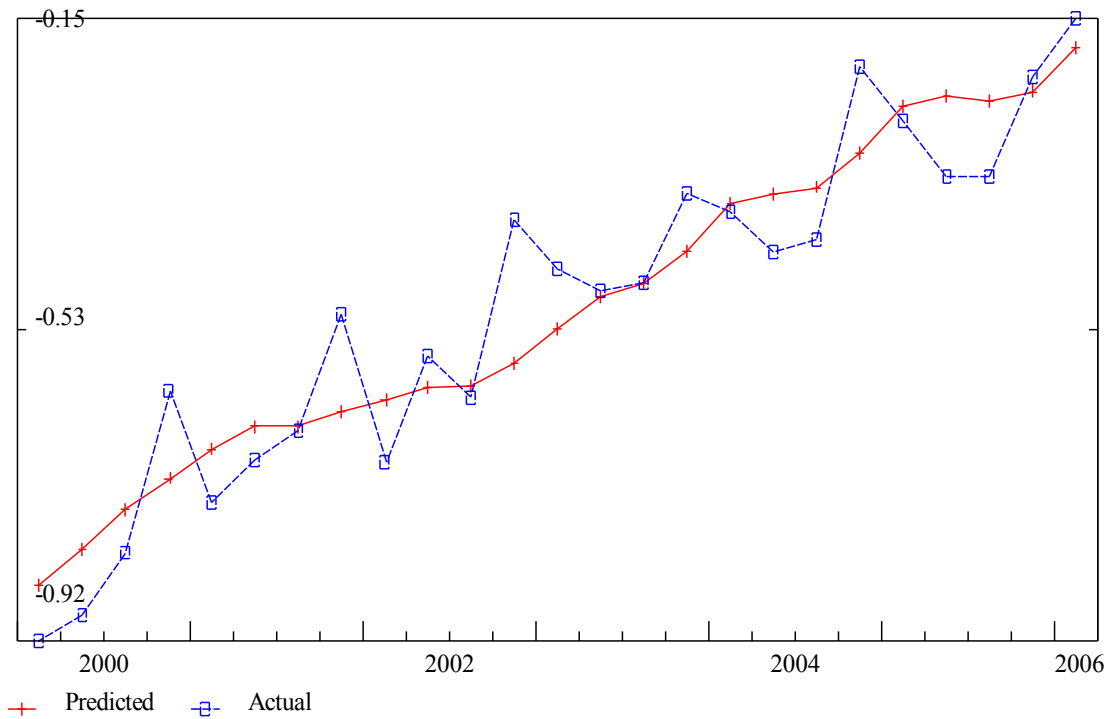
Consumer import share

```
r sh_iml= realrub_newl
:                          Consumer import share
  SEE   =        0.07 RSQ  = 0.8691 RHO =   0.05 Obser  =   25 from 2000.100
  SEE+1 =        0.07 RBSQ = 0.8634 DW  =   1.90 DoFree =   23 to   2006.100
  MAPE  =       14.53
   Variable name           Reg-Coef  Mexval  Elas   NorRes     Mean   Beta
  0 sh_iml               - - - - - - - - - - - - - - - - - -   -0.51 - - -
  1 intercept              -2.04119   254.9   4.01     7.64     1.00
  2 realrub_newl            0.78697   176.3  -3.01     1.00     1.95  0.932
```

Consumer import share
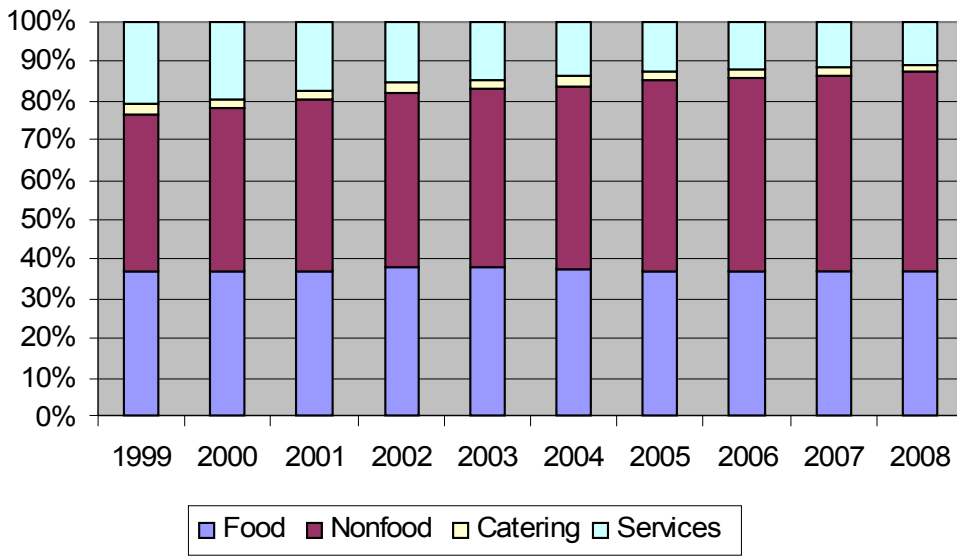
prices 1998.4

Predicted + — Actual ☐

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.

```
     Table1   PCE growth rates, prices 1998.4, %


                  2000   2001   2002   2003   2004   2005   2006   2007   2008


Retail turnover   12.2   12.1   11.0    9.0   13.8   15.2   12.5   11.9   14.2
 including

   Food           10.4    8.5   12.2    7.8   10.8   12.2   11.0   10.4   12.1

   Nonfood        13.8   15.4   10.0   10.1   16.3   17.5   13.6   13.0   15.8

   Catering       10.8    6.9    5.7    8.5   10.9    8.9    9.3    9.4   10.2

   Services        4.0   -4.1   -1.9    3.2    5.3    4.9    5.1    5.3    5.2
GDP               10.0    5.1    4.7    8.0    7.2    6.4    5.8    4.3    4.5
```

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.

Consumer market structure (prices 1998.4)

Legend: Food, Nonfood, Catering, Services
Years: 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008

Commodity resources structure (prices 1998.4)

Legend: Consumer import share, Domestic production share
Years: 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008