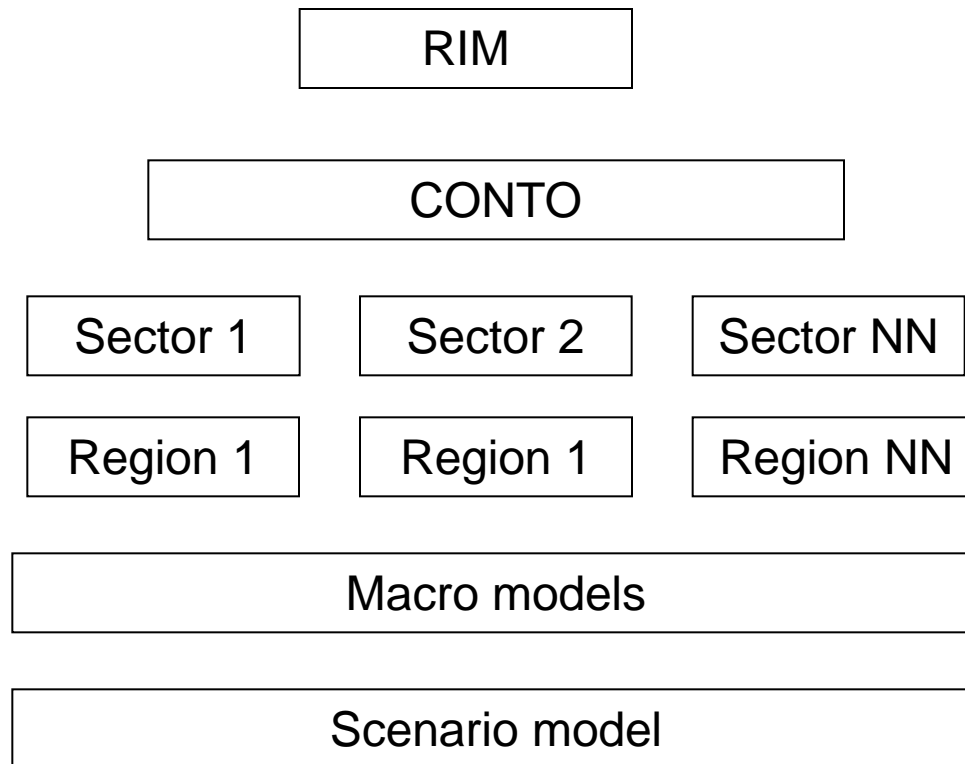# NEW PROPERTIES OF THE MODEL RIM. ASSESSMENT OF THE POTENTIAL GROWTH OF THE RUSSIAN ECONOMY

19th INFORUM CONFERENCE 2011 SOUTH AFRICA

Current system of IEF RAS models

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                    ┌──────────────────┐
                    │       RIM        │
                    └──────────────────┘

                ┌──────────────────────────┐
                │         CONTO            │
                └──────────────────────────┘

  ┌────────────┐   ┌────────────┐   ┌────────────┐
  │  Sector 1  │   │  Sector 2  │   │ Sector NN  │
  └────────────┘   └────────────┘   └────────────┘
  ┌────────────┐   ┌────────────┐   ┌────────────┐
  │  Region 1  │   │  Region 1  │   │ Region NN  │
  └────────────┘   └────────────┘   └────────────┘

  ┌──────────────────────────────────────────────┐
  │               Macro models                   │
  └──────────────────────────────────────────────┘

  ┌──────────────────────────────────────────────┐
  │              Scenario model                  │
  └──────────────────────────────────────────────┘
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Current conditions of the RIM

- I-O tables in current and constant prices for 1980-2010

- macroeconomic data (world economy, prices, budget…)

- 45 sectors

- equations for all elements of final demand and value added

- equations for labor productivity and employment

- institutional accounts

- energy balance and natural balances

Two versions of the RIM

Block of model	Clopper & Co, v2.2	Yantovsky & Co, v2.1
Investment	Investments are calculated from amounts of replacement required and output dynamics *capinv = a1 *replace +a2* dif +a3* dif[1] +a4*dif[2],* *where **replace** –replacements of retired fixed capital,* ***dif** - first difference of the industry's output*	Profits and levels of production capacity usage are also included in equations of investment by purchaser. Bridge matrix is used for construction of the vector of investment by sectors. *capinv = a *replace +a2* dif +a3*profit +a4*out/maxout,* *where –**out/maxout** – level of capacity utilisation*
Households consumption	Relative prices term is excluded from equations *pceRpc[i] =a_1 +a_2*pceRTpc + a_3*dinc* *pceRTpc = pceRT/pop* *dinc = pceRTpc - pceRTpc[1]*	Income of population is included in equation of personal consumption *pceRpc[i] =a_1 +a_2*pceRTpc + a_3*dinc+a_4*moneyinc+a_5*rprices* *where moneyinc – population incomes per capita,* *rprices – relative prices*

Export	Exports depends on real imports of the European Union and time $iex[i]= a_1 + a_2 * euroimpx + a_3 * timex$ $exR[i]=exR[i][1]*iex[i]$	Exports is calculated from outputs and world economic growth rates $exR=a1+a2*outR - a3*intCons+ a4*exR[1]*worldrate;$ ***worldrate*** *– world economy growth rate* ***intCons****- internal consumption –mostly represented by personal and governmental consumption*
Import	The ratio of imports to domestic demand (output + imports) is calculated as an exogenous vector and a Seidel procedure is modified to compute imports and outputs with these exogenously given ratios $ImShare=imR/(outR+imR)= a_0 + a_1/(1+a_2*exp(a_3*time))$ ***ImShare*** *– share of imports in internal consumption*	The ratio of imports to domestic demand is calculated outside the Seidel procedure. Exchange rate is included in calculation of imports. Also import ratio in internal consumption is affected by investments and constraints from productive capacities. $ImShare=a1+ a2*ImShare[1]*rateusd/rateusd[1]+ a3* capinv[1]/capstock[1]$ ***capinv[1]/capstock[1]-*** *share of new facilities in fixed capital* ***rateusd****- exchange rate*

| Employment | Employment is calculated by regression equations mainly from outputs

lempout = a1+a2*timet,
+a3*dlout + a4*ndlout

lempout= log(emp/outR);
lout = log(outR);
dlout= lout - lout[1];
ndlout = dlout-pos(dlout); | Employment is calculated as ratio of output and labor productivity.

emp=outR/labProd
labProd – labor productivity
labprod=labProd[1]
*(1+labProdStr
+a1*capinv/capstock)

capinv[1]/capstock[1]- *share of new facilities in fixed capital*
labProdStr *–growth rate of labor productivity caused by structural measures* |

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Productivity of primary sources as key indicator of technology changes in RIM

The main idea of Marat Uzyakov

- All final goods produced from primary sources (metals, wood, petroleum products, products of chemical industry, electric power etc.)

- If we produced more products from the same quantity of primary sources then we have more effective production (in sector compare between countries)

- If this hypnotize is truth we can use the data of developed countries as benchmark for growth of productivity for primary sources in Russia

- We understand that speed of changing in productivity of primary sources depends on fixed capital investment

The problems of transition economy

• For a long period Russian economy could grow without high share of investments in GDP (in 1999-2006 about 16% of GDP)

• In period 2000-2008 Russian economy had average growth rate of GDP about 7%

• This growth was based on the use of the old Soviet capital

• Old capital was created in old conditions: chip energy, low restrictions for labor forces ect. Old plants save old system of management.

• This problem can be solved in two ways. The first one – with help of fixed capital investment, the second with help of new methods in management

• The second way in not so expensive and allows to increase efficiency of production quickly enough.

• For example: growth of labor productivity in last years was connected with changing in structure of business and not so much depended on technological changes.

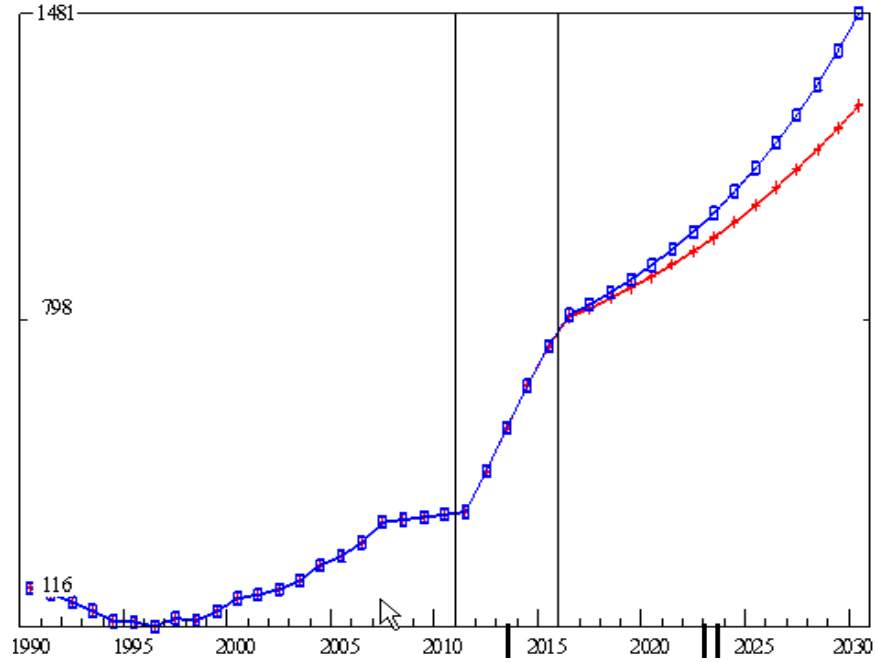• We have to take into account this factors in our models and forecast
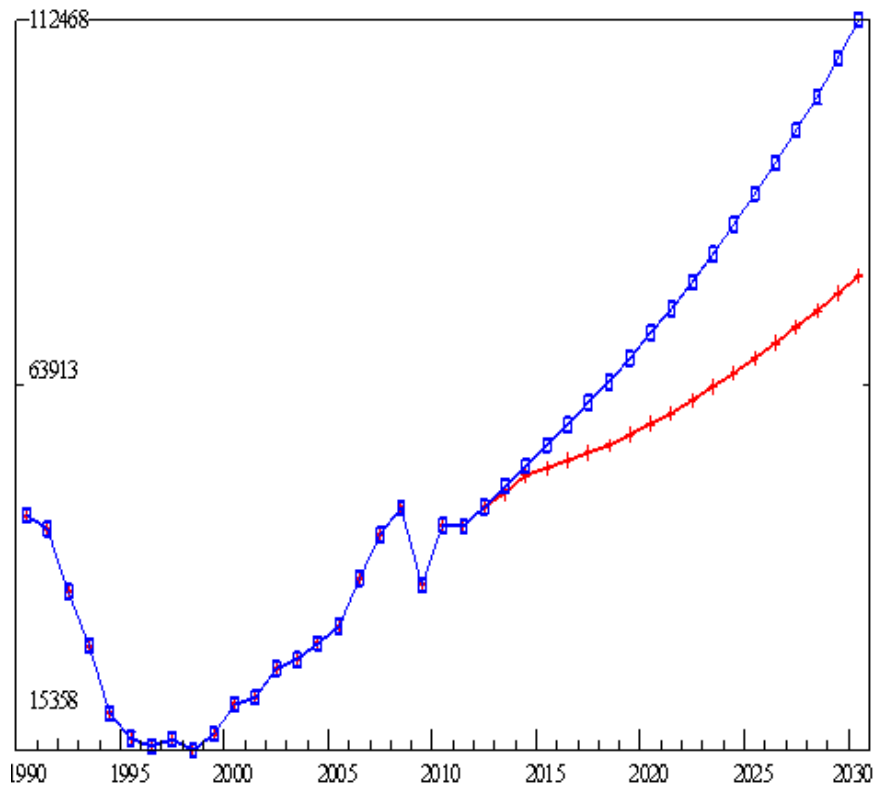
Electrical equipment: output at a constant prices
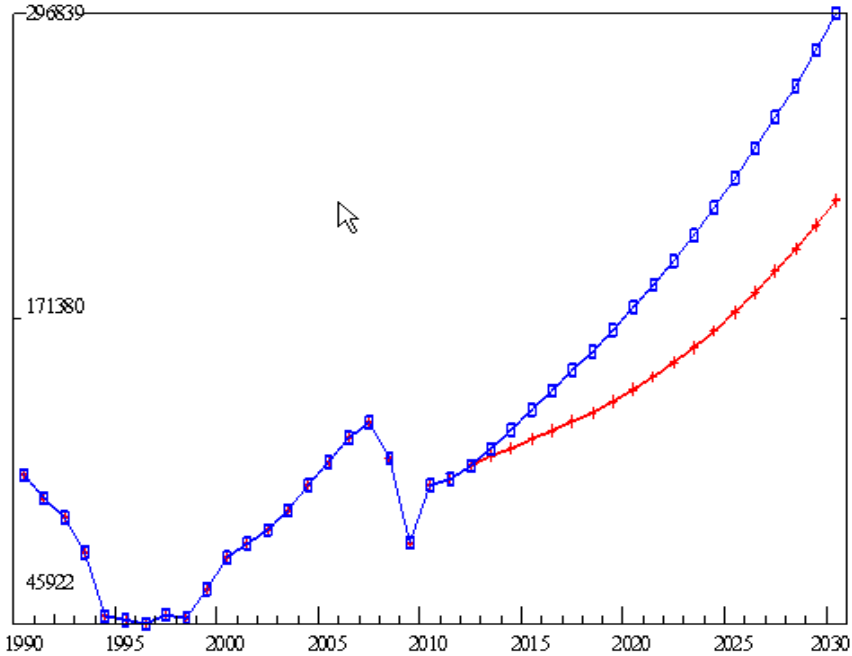
**Labor productivity in electro equipment**

In the first stage (I) of the forecast labor productivity growth depends on changes in structure of business in different sectors, in the second stage on changes in technology. Labor productivity depends on dynamics of primary sources productivity (blue line – growth of primary sources productivity scenario, red –inertial scenario)

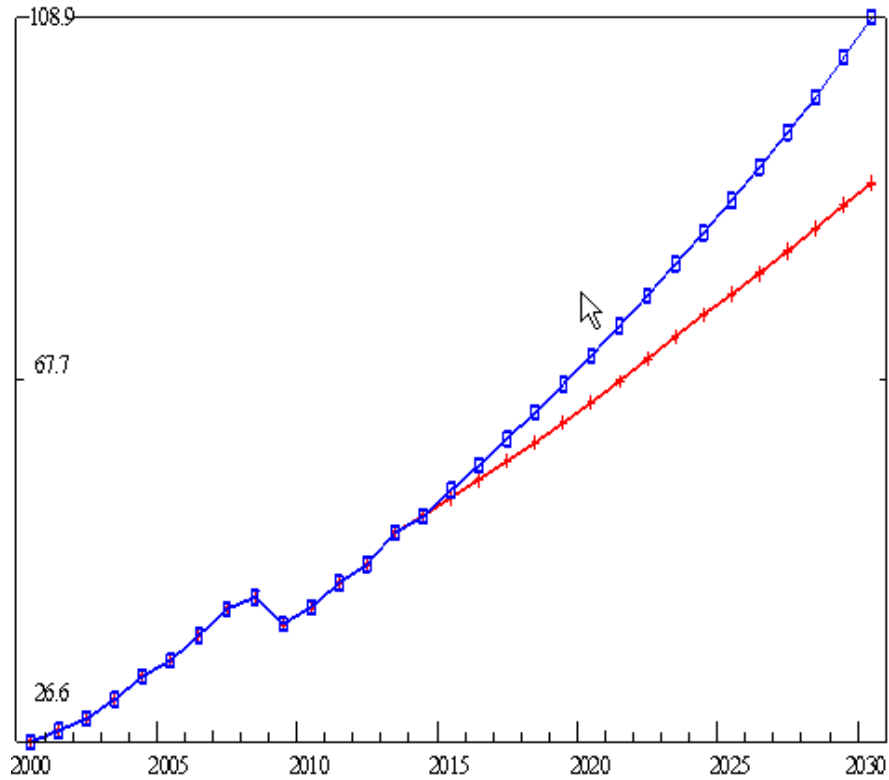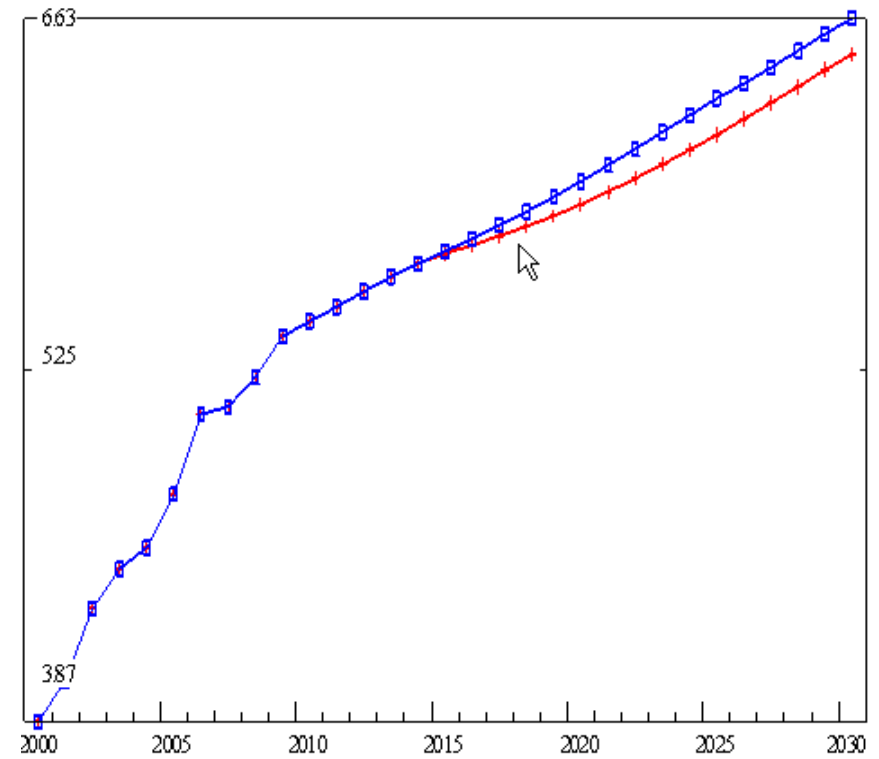| Air and space industry output	Labor productivity in air and space industry
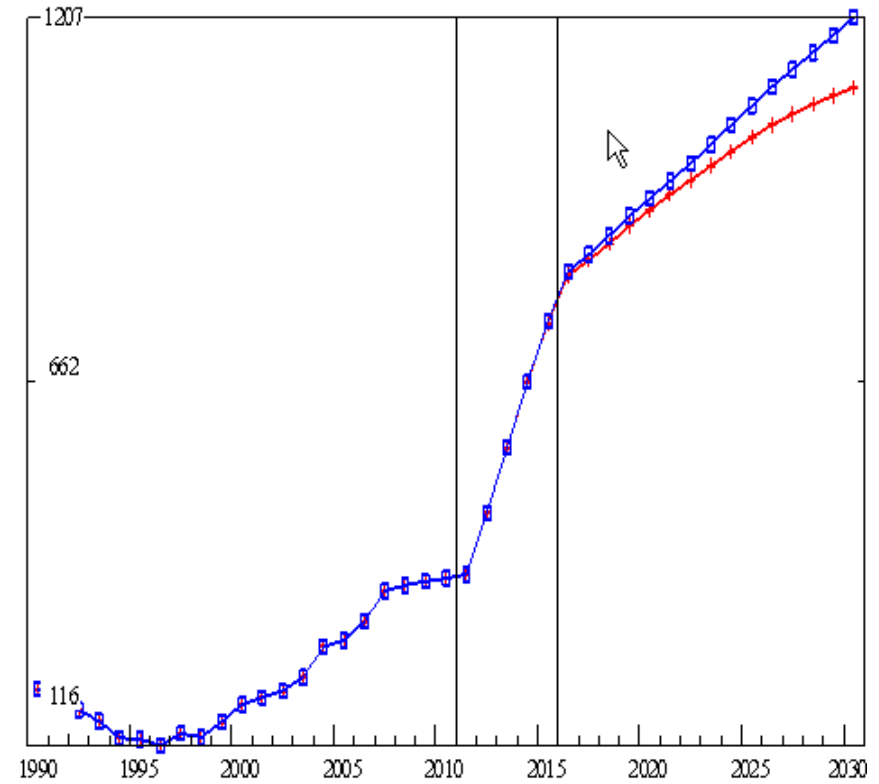
GDP in constant prices

Productivity of primary sources usage

BIG FIVE