Problem statement. Formulating a long-term strategy requires a review of alternatives and a search for an optimal combination of economic growth factors and conditions. On the other hand, the main challenge of studies and comparisons of alternative futures is to take cognizance of a host of feed-forwards, feedbacks, and different constraints, and to reconcile various hypotheses and initial premises. As concerns the formulation of regional strategies, programs, and long-term forecasts, the most important consideration is to take into account the relationship of the economy of the region and that of Russia as a whole. All this means that we need a specialized, and rather sophisticated, toolkit to conduct such coordinated computations and comparisons of alternatives.

Such a toolkit was developed at the Institute of Economic Forecasting (IEF), RAS, using a macroeconomic IO model of Russia, called RIM [1, 2]. It comprises a model of the Russian economy and a linked model of the Ivanovo oblast economy. This toolkit permits rather complex computations of economic policy options to be made for the next 15–20 years. The model can be used both for rough-and-ready scenarios, to help in the search for a strategic line of development, and for finalizing an economic program, i.e., as an instrument accumulating a rather wide spectrum of measures and proposals.

Ivanovo oblast is one of the most problem-ridden regions in Russia. Suffice it to say that the share of the oblast’s GRP in the Russian GDP fell to 0.28% in 2000 from 1.04% in 1990, and the share of transfers is upward of 40% of the extended budget. Prompted by the need for radical improvement of the socioeconomic situation in the region and the tasks of harmonization of the policy of the regional authorities with the long-term strategy of the federal center, the IEF was contracted by the regional administration to work out a medium- and long-term development strategies for Ivanovo oblast. It was designed to accomplish a number of tasks:

— to analyze the current state of the oblast economy;
— to appraise the growth potential of the oblast and the feasibility of a breakthrough scenario;
— to define long-term goals (a vision of the future);
— to form a concept for development, which includes strategic goals; and
— to develop prognostic scenarios of development for Ivanovo oblast coordinated with the development options for the Russian economy for the period up to 2020.1

Regional model requirements. Proceeding from the nature of the forecasting and analytical work for Ivanovo oblast, we formulated a set of basic requirements that a regional model was expected to meet.

The model must be interindustrial. Structural transformations are taking place in the economy of Ivanovo oblast, as they are throughout Russia’s economy. The model must therefore reflect the impact of structural shifts in the oblast economy upon the macroeconomic dynamics and performance of production entities. We were thus faced with the necessity of building Ivanovo oblast IO tables, to be able to make computations by the model.

Computations by the IO model of the Ivanovo oblast economy are be harmonized with computations by the model of Russia. A perfect solution is a model of the Ivanovo oblast economy as part of the general model of the Russian Federation, which implements both feedforward and feedback relations with the main model. However, given the complexity of the task and the fact that the impact of the Ivanovo oblast economy on the Russian economy is negligible compared with the latter’s impact on the region, at this stage, we implement a design scheme that models and assesses the influence of only one side, i.e., Russia, on Ivanovo oblast.

1 During the generation of a Russian economy development scenario, materials prepared by a working group headed by V.I. Ishaev, a member of the presidium of the Council of State of the Russian Federation, were used.
Key exogenous model parameters are to be both those of the federal center economic policy and of the region's policy. The former are input into the Ivanovo oblast economy model directly from the design banks of the Russian model (prognostic computations by the RF model). They describe the influence of general economic process in Russia on the region in question: change in the dollar rate, the growth of industrial production in Russia as a whole, the average income of the population, the average pension, etc.

The latter are given as exogenous (control) parameters of the economic policy of the region. They include price regulation, incentives for export activities, tax policy, etc.

The model must be able to calculate development options for the region. By varying the control parameters of the regional policy and also the development scenarios for Russia as a whole, we can compare different development pathways of the region.

The model must recognize the region's lack of several industries and the dependence of its industry on imported raw materials. Much of the raw materials consumed by the oblast industry is imported from other regions of the Russian Federation or from abroad. There is no possibility to employ internal primary resources to replace imported ones. Therefore, the output calculation procedure should take into consideration the dependence of the volumes of regional imports on the scale of operations.

Problems in building a statistical base. The statistical base of analysis and forecasting has, so far, remained the main stumbling block in the construction of econometric models, and even more so, models of regional economies. Although data books today include a multitude of new sections and vast numbers of new indicators reflecting the character of ongoing reforms in Russia, there is not, to this day, an adequate data base for the construction of a coherent system of accounts on a regional level. Furthermore, the existing data base is often inconsistent and insufficiently detailed. As a consequence, the problem of construction of accounting regional IO tables appears all but insolvable.

In these conditions, we can only develop IO tables of claims and liabilities that use as input current regional statistics, federal level data, and also more than 10-year old data of regional IO tables.

Figure 1 shows the general procedure of formation of IO tables of claims and liabilities for Ivanovo oblast.

The values of IO table variables, calculated both in constant prices (1997) and current 1990–1999 prices, are contained in the respective databanks of the IO model.

Model description. With a view to the comparability of interindustry balances and the ease of construction of the model the industry structure of the interindustry balances of Ivanovo oblast fully corresponds to the structure of the Russian Federation balances.

As in the Russian IO model, RIM, the real aspect of production (the output and distribution of products in constant prices) is calculated at each step of the model with the help of a static IO model. On the other hand, the prices for Ivanovo oblast, rather than being calculated in the framework of the region's price model (which, we feel, would be totally incorrect), are calculated depending on changes in the price situation in the Russian economy as a whole. In other words, both industry prices and deflators for the GRP functional elements are calculated based on the respective indicators of the Russian IO model. The model has the capacity to regulate prices using their exogenously fixed dynamics.

Prices, as well as bulk-line costs and the scale of operations industrywise, define in the final analysis values added in industries and the total value of GRP.

The final demand elements that form the physical dynamics of production are determined, industrywise, as follows:

—household consumption, as a function of prices, official incomes of the population, and the extent of legalization of its shadow incomes;

—public consumption, as a function of the dynamics of the respective expense items of the budget (in constant prices);

—fixed capital accumulation, as a function of the sources of finance of capital investment;

—the removal of products to the Russian Federation, as a function of the respective items of the output and distribution of Russian products;

—export outside Russia is given exogenously, depending on the extent of implementation of an export-oriented strategy; and

—the import of products, as a function of the respective elements of intermediate and final demand.

In addition to the exogenous parameters present in the Russian model, computations by the Ivanovo oblast model depend heavily on the following exogenous parameters: the oblast population; the number of pensioners; the oblast’s exports outside the Russian Federation; the quality dynamics of exported products; tax rates; the rate of tax collection; the expert appraisal of the share of shadow incomes of the population; the share of investments (with respect to intraregional ones) attracted from outside of the region; and the dynamics of industries’ materials-output ratio.

As already mentioned, federal transfers play an extremely important role in the development of Ivanovo oblast. Their level in the model is defined endogenously depending on the relative level of the economic development of the region.
The interaction of the Russian model (RIM) with the model of the Ivanovo oblast economy is described in a rough outline by the scheme below (Fig. 2).

**Computation algorithm.** In the Ivanovo oblast model, the output and distribution of products are calculated in constant prices, and gross value-added and its distribution, in current prices. The model divides the economy into 25 net production branches.

For each year, an iterative calculation process is performed, which is terminated by a convergence criterion. In the present version, the convergence criterion is the comparison of GDP volumes obtained during two successive iterations at a given error.

At the start of the iterative process, each internal variable of the model is assigned a value, produced by the previous step. Therefore, the results of each iteration (or year) are starting values for the next iteration (or year). Further, at the first step of iteration, the vectors of the elements of final demand are calculated in constant prices. Also calculated are the respective vectors in the current prices obtained at the previous iteration. Then, based on the vector of the industry components of final demand \((fd)\) and the matrix \(A\) of input-output coefficients, the vector of industry gross outputs \(\text{out}\) is calculated.

\[
\text{out} = A\text{out} + fd,
\]

\[
\text{out} = (E - A)^{-1}fd,
\]

where \(E\) is an identity matrix.

Further, based on the values of industry gross outputs and final demand, the gross value-added and its components are calculated.

At the last step of iteration, current prices are calculated.

**Main model blocks. Conventional signs.** The IVID model is a derivative of the RIM model, therefore, as we built it, we used wherever possible the names of variables corresponding to their counterparts in the Russian model. To differentiate between variables describing identical indicators in the Russian and Ivanovo models, as well as the time and industry aspect, we introduced the following designations:

- \(<\text{name of indicator}>\) RF, a variable describing a Russian economy indicator;
- \(<\text{name of indicator}>[i]\), a variable describing the \(i\)th industry;
- \(<\text{name of indicator}>\) \([i]\), a variable describing the \(i\)th industry;
- Deflators for intermediate consumption of Russia;
- Deflators for intermediate consumption;
- Deflators for Ivanovo oblast gross outputs;
- Industry structure of GRP elements used;
- GRP utilization account;
- Intermediate consumption flows;
- Gross outputs by branches of the Ivanovo oblast economy;
- Statistics of commodity turnover, investment, etc.
- Cost structure of Ivanovo oblast industries;
- Input coefficients of the European part of Russia;
- Matrix of input coefficients of Ivanovo oblast;
- Matrix of input coefficients of Russia;
- Balancing of statistics of production, consumption, investment, import-export, etc.
- IO interindustry balance in comparable prices;
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- Deflators for Ivanovo oblast gross outputs;
- GRP utilization by industries;
Our hypothesis is that this increase in household consumption will not change consumption structure, \( cstr \):
\[
cstr = c[i] / cT;
\]
\[
c[i] = cT[t] cstr.
\]

---

**Final demand of public and noncommercial organizations** (public consumption for short), \( gT \), is modeled as follows:

Change in the volumes of public consumption is taken to be in proportion to change of the final aggregate \((b – tr)/dgRF\), where \( b \) is the oblast budget expenditures; \( tr \) is social transfers; and \( dgRF \) is the deflator of the public consumption of the Russian Federation.

Then, the aggregate consumption in year \( t \) is given by the formula
\[
gT[t] = gT[t-1]((bp[t] - tr[t])/dgRF[t])/((b[t-1] - tr[t-1])/dgRF[t-1]).
\]

We use for our public consumption structure the 1999 public consumption structure (vector \( gstr99 \)) with a superimposed dynamics of the public consumption structure of the Russian Federation, \( gstrRF[t] = (gRF[i][t]/gTRF[t]) \) and normalized so that \( \sum_{i=1}^{n} gstr99[i] = 1 \).

Public consumption by kind \( g[i][t] = gT[t] gstr[i][t] \).

**The gross accumulation of fixed capital** (\( invT \)) is described by the equation
\[
invT[t] = (1 - rext[t]) cex[t]/dil[t] + (1 + vi[t]) invT[t-1]((amT[t])
+ prT[t])/((di[t])/((amT[t-1]
+ prT[t-1])/((di[t-1]))).
\]

The first addend represents investment owing to the flow of funds from capital return (\( cex \)), the second represents fixed capital growth over a year before owing to outward investment (the share of outward investment \( vi \),...
amortization (am), and profits (pr) of enterprises and organizations; di is the investment deflator.

Outward investment consists not only of credits by foreign financial institutions and companies, but also previously exported capital that has been returned to the country. This is not the same capital return as mentioned previously. In the former case, mention was made of measures to stem the flow of exported capital, to reduce the export of funds, while here we mean the return of previously exported capital. As in the case of public consumption, we adopted as our industry structure the 1999 structure (istr99) with a superimposed dynamics of structure of accumulation of fixed capital of the Russian Federation (pubRF[i]/pubTRF):

\[ \text{inv}[i][t] = \text{inv}[T][\text{istr}[i][t]. \]

The model divides the export of goods and services from Ivanovo oblast into export to the Russian Federation and export to far-abroad countries. It should be mentioned that this division is made primarily in order to reflect differences in prices at which regional products are exported beyond Ivanovo oblast. For example, if a product is bought at Russian prices by a middleman, who is legally a Russian entity located outside the oblast, and then resold abroad, this transaction refers to exports to Russia. Therefore, the parameter of the increase of foreign exports (iex) and priceadvance (pex) includes:

— an increase in the quality of exported products, which should lead to increased demand for it and a price rise; and

— the establishment of direct contacts with foreign buyers, and hence, a decrease in the number of middlemen, by dint of which some of the export will be transferred from the item Russian to Foreign, which means growth of exports and the rise of the selling prices of goods with the disappearance of expenditure on middlemen.

Thus, the Ivanovo oblast export beyond Russia (ex) is calculated by the equation

\[ \text{ex}[i][t] = \text{ex}[i][t] - 1 \times [\text{exTRF}[i]/\text{exTRF}[t - 1)] \times \text{pex}[i][t], \]

where exTRF[i]/exTRF[t – 1] is the dynamics of Russian export.

The export of goods and services to Russia depends on demand, i.e., the volumes of materials costs and final demand in the Russian economy. It is modeled by regression equations, their parameters including industry outputs, Russian industry price indices, and a matrix of interindustry flows of intermediary consumption of Russia.

Import is calculated depending on the indicators of domestic demand for goods and services.

In addition, the calculation of industry outputs involves an import adjustment procedure, since imported raw materials (i.e., materials coming to the oblast both from Russia and beyond) make up a significant share of the materials costs of industry, e.g., energy carriers, cotton, etc.

Oblast budget revenues are formed by oblast tax revenues and federal transfers.

Tax revenues (bi) are defined by the equation

\[ bi[t] = s[t] + l[t] \times \text{va}[T][t] + \text{cex}[i][t] + \text{li}[t]. \]

where s is an exogenous control parameter of regional policy, the tax collection rate; t is another exogenous control parameter of regional policy, the tax rate; and the sum in parentheses is the tax base consisting of GRP (official) (vaT), returned capital (cex) and legalized shadow incomes that become taxable (li).

Federal transfers (bt) are divided into social transfers (st) channeled to the payment of pensions, benefits, etc., and transfers from the Federal Fund for Financial Support of Federation Members (ft).

\[ bt[t] = ft[t] + st[t], \]

\[ st[t] = p[t] \times \text{paRF}[t] - \text{up}[t] \times \text{pp}[t]. \]

where p is the number of pensioners in the oblast, and paRF is the average pension in the Russian Federation.

Prices and revenues block. Average industry prices from the Russian model and cost coefficients determine gross value-added in the region’s industries.

Wages are calculated in proportion to value-added.

Social insurance contributions are calculated in proportion to wages.

Depreciation is given in proportion to value-added.

Profit is the difference between gross value-added and its other constituents.

Deflators are calculated from the values of the respective deflators of the Russian model.

Total deflated incomes of the population are calculated by the equation

\[ \text{in}[i][t] = (\text{st}[t] + \text{wT}[t] + \text{sc}[T][t] + \text{dw}[t] \times \text{fa}[i][t] + \text{li}[t]) / \text{cpi}[t], \]

where w is wages, sc is social insurance contributions, fa is gross disposable income of the industry, adjusted for capital return, and dw is the share of gross disposable income finding its way into incomes of the population.
Hence the deflated per-capita income is

\[ \text{inp}[t] = \frac{\text{in}[t]}{\text{pp}[t]} \]

Economic policy and results of forecast computations. The development of any region, including Ivanovo oblast, is in large part a consequence of processes taking place in the Russian economy at large. In other words, the pattern of development of the Russian economy determines in a sense growth opportunities and largely defines the future advance of the regional economy.

In this context, we undertook the task of generating a long-term scenario of development of the Russian economy. Because we realized the variability of the future of the Russian economy, we limited ourselves to one, rather optimistic, scenario. This is explained, first, by the fact that all the Ivanovo oblast scenarios considered below have instrumental significance, i.e., they are designed for choosing a development strategy, and second, our analysis shows that should the Russian economy turn for the worse, it will be virtually impossible to implement any positive program in Ivanovo oblast.

Table 1 shows key macroeconomic characteristics of the scenario of development of the Russian economy as well as the dynamics of some economic policy parameters.

To better understand the findings and nature of forecast computations for Ivanovo oblast, let us dwell on key interactions that define the influence of the Russian economy on the regional economy and are represented in the IO model.

First, the part of the production exported from the region that is consumed in Russia depends, naturally, on the relevant demand characteristics of the Russian economy.

Second, the dynamics of the regional prices in the model is directly dependent on the prices formed in the Russian economy.

Third, transfers, both social and from the Federal Fund for Support of Regions, are largely determined by budget receipts. Besides, the size of transfers depends on the relative economic development, i.e., the ratio of the per-capita incomes of Ivanovo oblast and Russia at large.

Our forecast computations sought primarily to make the choice of a development strategy a more deliberate exercise, which could determine the efficiency/inefficiency of particular economic policy measures even at a preliminary stage. Experience shows that it is not enough to conduct a series of forecast computations with different sets of exogenous parameters. To compare scenarios, and even more so, the strength of particular control actions, the scenarios must be comparable to some extent. This requires, in turn, that they be somewhat simplified.

Therefore, in order to ensure the comparability of our computations, a large group of exogenous parameters was taken to be constant for all the calculation options described below. The constancy of parameters from option to option does not mean their constancy in time. These variables include:

—population, 1 143 000 in 2020;
—pensioners, 364 000 in 2020;
—taxes, at the 1999 rate;
—rate of budget deficit (percent of GRP) is zero since 2005;
—public debt payments, 200 million rubles/year;
—the share of subsidies in GRP is fixed at the 1999 level; and

—the share of foreign investment in the total capital investment is at the 1999 level.

It should be noted that the model makes it possible to appraise the impact on the economy of each factor. Yet this involves dozens, sometimes over a hundred, computations, which are not at all easy to review and compare. Besides, in the event of development of a

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<tr>
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<td>5.4</td>
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<td>4.3</td>
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<tr>
<td>Household consumption</td>
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<td>1.4</td>
<td>1.7</td>
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<td>4.2</td>
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<td>Minimum wage dynamics</td>
<td>17.7</td>
<td>4.8</td>
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<tr>
<td>Capital outflow contraction</td>
<td>43.1</td>
<td>14.9</td>
<td>7.2</td>
<td>2.9</td>
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detailed, time-separated action program based on the proposed or some other development strategy, a more thorough and detailed computation procedure is possible, which takes into account changes in all the exogenous variables.

As for the key variables of the model, on which the variation of scenario computations depends, their list is short. It includes:

The index of the lead of the export dynamics of products of Ivanovo oblast industries over the dynamics of the Russian economy. This index is certainly not a direct-action economic policy parameter. However, the region’s export opportunities to a large extent depend on the activity and specific actions of regional authorities. By including this variable in the model we can assess the consequences of the efforts that regional authorities, with the support of business and the federal center, can make to strengthen the expert orientation of the region.

The index of the lead of export product prices shows the extent to which the prices of exported products of Ivanovo manufacturers are growing faster than the respective prices in the Russian model. While the previous variable shows the relative lead of the dynamics of quantitative characteristics of export, the idea of this variable is to show the relative lead of the dynamics of quality. This variable, like the previous one, is connected with the ideology of improvement of exchange ratios. Besides, it bears direct relation to the problem of quality of economic growth.

Growth in the rate of tax collection. The rate of tax collection in Ivanovo oblast is currently estimated at 70–75%. Therefore, the potential for growth of the tax collection rate is 25–30 percentage points.

Decreased shadow outflow of capital. The initial estimate of the annual outflow of capital is $50–100 million. It is conjectured that a purposeful economic policy of regional authorities, coordinated with federal efforts, may ensure a substantial, 5–10-fold, decrease in the scale of illegal outflow of capital. It is further conjectured that decreased capital outflow will lead to a corresponding increase in final domestic demand and, hence, will be an important factor in speeding economic dynamics.

Share of returned capital. Presumably, the capital that has been taken out of Ivanovo oblast during more than a decade, which we estimate at $1 billion, given an appropriate investment climate, is a potential resource of investment in the regional economy. Thus, this variable shows the proportion of removed capital presumably coming back to the Ivanovo oblast economy.

Decrease in people’s shadow incomes. As our analysis has shown, the share of unaccounted earnings is quite high in Ivanovo oblast. Their legalization spells the legalization of earnings not only of people at large but also of respective businesses. The region’s tax base is thus increased.

The share of investment in budget. According to computations by the model, the mobilization of existing reserves increases budget receipts so much that public spending on capital investment in the respective scenarios can be markedly increased.

Our economic analysis suggests that virtually every tendency recorded by official statistics reveals a steady relative deterioration of the Ivanovo oblast’s standing in the Russian Federation over the last ten years.

The region’s long-term prospects appear to be still more depressing should the prevailing structural relationships and reproduction mechanisms last. Our computations by the Ivanovo oblast interindustry macroeconomic model, coordinated with the respective model of the Russian economy, suggest that even in the framework of the upper (optimistic) development option for the Russian Federation, the improvement of the economic situation in Ivanovo oblast is very insignificant in the framework of the inertial scenario (Table 2).

The region’s relative lag not only persists but continues to increase at an accelerated pace. For instance, the share of the GRP in the Russian GDP falls to 0.22% in 2020 from 0.32% in 1999.

When we go over to the export-oriented scenario, there is a sharp improvement in all indicators. At the same time, it has to be admitted that we consider the

Table 2. Predicted average annual rate of growth of the Ivanovo oblast GRP and its constituents by five-year periods (the inertial scenario), %

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>GRP</td>
<td>3.4</td>
<td>1.6</td>
<td>1.6</td>
<td>1.3</td>
</tr>
<tr>
<td>Including:</td>
<td></td>
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<tr>
<td>household consumption</td>
<td>2.9</td>
<td>0.6</td>
<td>0.0</td>
<td>–0.3</td>
</tr>
<tr>
<td>public consumption</td>
<td>2.1</td>
<td>0.8</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>capital accumulation</td>
<td>1.6</td>
<td>–0.2</td>
<td>1.6</td>
<td>1.3</td>
</tr>
<tr>
<td>export</td>
<td>7.7</td>
<td>4.4</td>
<td>4.5</td>
<td>3.6</td>
</tr>
<tr>
<td>also beyond RF</td>
<td>1.9</td>
<td>1.4</td>
<td>1.7</td>
<td>1.6</td>
</tr>
<tr>
<td>import</td>
<td>3.9</td>
<td>1.2</td>
<td>0.9</td>
<td>0.6</td>
</tr>
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</table>


**Table 3.** Predicted average annual rate of growth of the Ivanovo oblast GRP and its constituents by five-year periods (the export-oriented option), %

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</thead>
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<td>Including:</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>household consumption</td>
<td>3.5</td>
<td>2.3</td>
<td>2.2</td>
<td>2.8</td>
</tr>
<tr>
<td>public consumption</td>
<td>1.2</td>
<td>1.6</td>
<td>1.9</td>
<td>2.1</td>
</tr>
<tr>
<td>capital accumulation</td>
<td>6.1</td>
<td>4.9</td>
<td>7.5</td>
<td>9.6</td>
</tr>
<tr>
<td>export</td>
<td>11.5</td>
<td>8.9</td>
<td>8.9</td>
<td>8.9</td>
</tr>
<tr>
<td>also beyond RF</td>
<td>17.0</td>
<td>15.6</td>
<td>13.3</td>
<td>12.7</td>
</tr>
<tr>
<td>import</td>
<td>5.4</td>
<td>4.0</td>
<td>4.6</td>
<td>5.7</td>
</tr>
</tbody>
</table>

**Table 4.** Predicted average annual rate of growth of the Ivanovo oblast GRP and its constituents by five-year periods (the balanced growth option), %

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<tr>
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</thead>
<tbody>
<tr>
<td>GRP</td>
<td>7.8</td>
<td>6.2</td>
<td>5.8</td>
<td>6.3</td>
</tr>
<tr>
<td>Including:</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>household consumption</td>
<td>5.7</td>
<td>3.5</td>
<td>3.3</td>
<td>4.2</td>
</tr>
<tr>
<td>public consumption</td>
<td>2.4</td>
<td>2.5</td>
<td>4.0</td>
<td>2.8</td>
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<tr>
<td>capital accumulation</td>
<td>24.0</td>
<td>12.2</td>
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<td>7.8</td>
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<tr>
<td>export</td>
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<td>8.9</td>
<td>8.9</td>
<td>8.9</td>
</tr>
<tr>
<td>also beyond RF</td>
<td>17.0</td>
<td>15.6</td>
<td>13.3</td>
<td>12.7</td>
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<tr>
<td>import</td>
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<td>6.5</td>
<td>5.6</td>
<td>6.4</td>
</tr>
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**Table 5.** Predicted key socioeconomic indicators in current prices (the balanced growth option)

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<tr>
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<tr>
<td>GRP</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivanovo oblast, mln rubles</td>
<td>14006.3</td>
<td>21305.8</td>
<td>37953.9</td>
<td>56275.4</td>
<td>81591.6</td>
<td>124108.2</td>
</tr>
<tr>
<td>per-capita</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>rubles</td>
<td>11494.7</td>
<td>17485.3</td>
<td>31148.1</td>
<td>46184.2</td>
<td>66960.7</td>
<td>101853.3</td>
</tr>
<tr>
<td>dollars at the rate</td>
<td>441.5</td>
<td>629.6</td>
<td>815.7</td>
<td>985.4</td>
<td>1205.5</td>
<td>1571.7</td>
</tr>
<tr>
<td>dollars by PPP, rubles/dol.</td>
<td>2489.9</td>
<td>2674.5</td>
<td>3533.9</td>
<td>4402.8</td>
<td>5423.2</td>
<td>7032.6</td>
</tr>
<tr>
<td>Industry production, mln rubles</td>
<td>13775.4</td>
<td>20713.2</td>
<td>37525.9</td>
<td>55379.8</td>
<td>77152.9</td>
<td>112035.8</td>
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<tr>
<td>Agricultural produce, mln rubles</td>
<td>2155.5</td>
<td>2988.9</td>
<td>4904.9</td>
<td>6688.0</td>
<td>9858.8</td>
<td>14209.4</td>
</tr>
<tr>
<td>Extended budget receipts, mln rubles</td>
<td>5916.2</td>
<td>8720.3</td>
<td>16767.1</td>
<td>24925.6</td>
<td>36605.6</td>
<td>55856.6</td>
</tr>
<tr>
<td>including transfers</td>
<td>2694.8</td>
<td>3821.5</td>
<td>6364.9</td>
<td>7867.6</td>
<td>9482.5</td>
<td>10841.3</td>
</tr>
<tr>
<td>of these</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>social</td>
<td>1812.9</td>
<td>2846.3</td>
<td>4845.7</td>
<td>6325.6</td>
<td>8002.5</td>
<td>9689.0</td>
</tr>
<tr>
<td>from FFSE</td>
<td>881.9</td>
<td>975.2</td>
<td>1519.2</td>
<td>1542.0</td>
<td>1480.1</td>
<td>1152.2</td>
</tr>
<tr>
<td>Economy profit, mln rubles</td>
<td>1984.5</td>
<td>2930.3</td>
<td>4676.8</td>
<td>6969.3</td>
<td>10630.0</td>
<td>16676.7</td>
</tr>
<tr>
<td>Mean profitability of economy, %</td>
<td>13.9</td>
<td>12.0</td>
<td>12.5</td>
<td>16.7</td>
<td>23.5</td>
<td>32.1</td>
</tr>
</tbody>
</table>
export-oriented option in pure form, as it were, since our computations by this option are limited to the parameters defining the lead of the physical export dynamics and the lead of the cost estimates of exports. This scenario is not very realistic for several reasons.

First, export orientation cannot become stronger of itself, without an active economic policy to boost production efficiency in all areas.

Second, since in this option the rate of growth of investment (the accumulation of fixed capital) outstrips GRP dynamics, it is clearly insufficient, considering a nearly 10-fold decline in previous years, for securing a 4–6% annual growth of GRP. In this sense, this option can be considered insufficiently balanced. On the other hand, it enables one to estimate the potential “power” of the export orientation strategy and compare it with other key thrusts of economic policy (Table 3).

The internal reserves mobilization option is, in a sense, the opposite of the previous one, because it “includes” all the other factors of activation of economic dynamics the model uses but completely excludes parameters determining the strengthening of the export orientation of the Ivanovo oblast economy.

Our computations show that the combined effect of these factors is less than the influence of the economic strategy constituent associated with export orientation and exchange ratio improvement. Suffice it to say that the size of the GRP in the export-oriented option (in constant prices) in 2020 turns out to be 1.5 times more than in the internal reserves mobilization option.

The balanced growth option, as to its scope, includes the two previous ones. On the one hand, it implements the export-oriented strategy, and on the other, it involves the mobilization of all reserves, which are primarily connected with the shadow economy.

According to computations, this option is the best in the majority of parameters. On the other hand, the per-capita GRP by the ruble purchasing power parity is only $7000. It means that even given the most favorable (in terms of the approximation of nominal goals) relative dynamics of domestic prices and dollar rate, the implementation of this option does not achieve a per-capita GRP of $12000.

It is essential that in the framework of the parameters included in this version of the model, it is virtually impossible to attain greater increments of economic dynamics and the standard of living.

Admittedly, our computations probably omitted some major reserves and factors of economic dynamics.

First, as follows from our analysis, a substantial change in price ratios was one of the principal reasons for the 1992–1998 recession. This suggests that if domestic price ratios are better adjusted in accordance with the technological characteristics of the domestic economy, it will lead to a marked improvement of the financial and economic situation, especially in manufacturing industries. Although this potential is limited mainly to natural monopolies, it is quite substantial nevertheless. Yet its activation is largely the purview of federal economic policy. Our expert judgment is that a rational price policy at the federal level can secure at least a one percentage point increment of economic dynamics.

Second, our IO model computations relied on a constant matrix of input-output coefficients. Yet, technological change can be quite substantial within a 20-year period (Tables 4, 5).

Our second expert judgment is that technological progress in the framework of the very high investment dynamics observed in the balanced growth option should also secure at least another 1% of economic growth annually.

Third, for ease of comparison, export volumes are quite identical in the export-oriented option and the balanced growth option, since their control parameters are identical. Yet it is obvious that the latter option, by vir-
tue of significantly higher growth rates of the economy, offers greater export opportunities.

Finally, possibly higher rates of economic growth in Russia generally may also contribute to the achievement of even higher values of summary characteristics of this option.

Figures 3 to 5 give a more graphic picture of the correlation of these options.

To summarize our comments and estimates, it can be conjectured that achieving a $12000 per-capita GRP in Ivanovo oblast by 2020, although difficult, is quite feasible.

REFERENCES

![Fig. 5. Per-capita consumption in Ivanovo oblast in relation to Russia: ----- inertial; - - - export-oriented; - - - - mobilization of internal reserves; ----- balanced growth.](image-url)