

Problems of Prognostic-Analytical Support of the Interrelations between Business and State Structures¹

A. A. Shirov

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Abstract—The methodical approaches to analysis and forecasting of economic dynamics are considered in the paper in terms of the arrangement of the interrelations between private business and the state. An approach is suggested, which connects the development parameters of the country's economy, some types of economic activities, and corporations into one analytical complex during the development and discussion of key measures in the sphere of the management of the national economy.

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The economic development of the country significantly depends on the quality of the economic policy. The adoption of the most important strategic decisions is almost always accompanied by relevant discussions both on the level of governmental structures and the dialogue between business and the state. As a rule, such discussions are reinforced with substantiating materials, which is different in nature, and reflects the opinions of the parties in relation to the considered matter. Moreover, the adoption of a decision is often delayed not only because the parties have different views on the substance of the issue, but also because the parties formulate their positions on different approaches to the analysis of the economic situation, which results in a “failure of communication”, since the parties do not accept each others' arguments. In particular, a significant part of “The Concept of the Long-Term Development of the Russian Federation” was connected with the fact that society did not understand the aims and tasks of this document, as well as its place in the system of the state's management of the economy.

Based on the fact that all resources in the country are at the disposal of the state, the business sector, and the population, and their most optimal distribution ensures the stable development of the national economy, it becomes clear that the adoption of balanced decisions is almost impossible without mutual consideration of the interests of the largest economic agents.

The evident contradiction between the interests of entrepreneurs and the state (as economic agents) consists in the difference of the tactical tasks facing them. While the state adopts the decision on the basis of the general macroeconomic and budgetary considerations, entrepreneurs, primarily, are interested in the economic efficiency of the adopted measures for a

specific business. This contradiction is fundamental and it should be always kept in mind but, at the same time, it is necessary to consider the fact that if we put aside specific details, then the substance of the interrelations of the business sector and the state in the modern market economy consists in finding a reasonable balance between the interests of counteragents, in order to increase the general quality of life in the country.

The current problems of communication between the business sector and the state authorities can be partly explained by the gaps in the Russian system of professional education. Modern Russian companies include developed management structures and sufficiently qualified personnel in the sphere of corporate economy and finance. Therefore, the analysis of investment projects and economic calculations at the company level do not represent a significant problem. Company employees have the possibility to increase their professional level both inside the company and by means of the existing system of extended education (MBA programs, education, and training abroad). At the same time, matters of macroeconomic analysis are still beyond such programs and are considered superficially on the basis of studying Western courses that have already been developed. As a result, graduates from some economic educational institutions know the American economy better than the Russian one. This is probably connected with the fact that the demand of large business for knowledge of the mechanisms of the formation of macroeconomic dynamics has appeared only in recent years, when the economic development of Russia has strengthened the effect of some companies and the business community as a whole in the adoption of decisions in the sphere of state management. Besides, the investment and consumer boom and the development of the national market naturally increased the interest of business in the intraeconomic situation. Unfortunately, the economic crisis of 2008–2009 weakened the confidence between

¹ See also M.S. Gusev, A.A. Shirov, Two crises. Comparative analysis of events in 1998 and 2008–2009, *Problemy prognozirovania*, 2009, no. 5.

business, the state, and the expert community. Representatives of the business sector fairly mentioned the fact that experts and analysts could not define the possibility of the occurrence of a crisis of such scale. At the same time, claims against the business sector consist (among others) of the absence of good quality strategic planning, low production efficiency, and a great number of unreasonably risky operations. The crisis demonstrated the presence of significant problems, both during the determination of prospects of economic development and the formulation of a general development strategy, and the adoption of certain business decisions at the company level. It has to be admitted that both the expert community and the business sector have little knowledge of their own economy and were unable to quickly estimate the macroeconomic risks and respond to the increased external and internal threats. This led to the absence of uniform approaches in the evaluation of the economic situation, difficulties in adopting anticrisis decisions, understandable to all the interested parties.

Until recently, even large Russian companies have treated macroeconomic statistics with a certain prejudice, considering that the aggregation and analysis of data at the level of the economy as a whole does not permit one to significantly improve the quality of the adopted management decisions taken at the company level. However, while the state regulation in the economy and the development of the scale of the Russian business sector strengthened, it became clear that without extracting a precise picture of the interaction between the business sector and the state, it was impossible to substantiate different methods of supporting the economy, change the current taxation system, etc. The crisis of 2008–2009 aggravated this problem to an even greater extent.

The adoption of management decisions and the development of prospective business strategies of companies assume the use of some indices as incoming parameters, reflecting the development of the macroeconomic situation. The following indices used, for example, during the development of prospective business plans, can be referred to as the key ones: exchange rate parameters, inflation indices, tariffs of natural monopolies, prices in the world markets, etc. As a rule, projects of the Ministry of Economic Development of the Russian Federation (MED) are used as reference points for the execution of the relevant plans. However, as experience has shown, the forecast estimations of the MED are subject to frequent reconsideration, aimed at conservative scenarios of changing the situation in the Russian and the global economy.

The conservatism of the MED scenarios is explained particularly by the fact that the governmental forecast is directly connected with the budget process and has been (on an actual basis) defined recently by the current budget strategy. As a result, the forecast

indices can be significantly underscored. From the point of view of the formation of the budget parameters, it probably makes some sense however, from the point of view of estimating the real prospects of economic development, it creates additional difficulties for understanding the current economic situation. The MED forecast has essentially stopped playing a full role as a reference point of the mid-term development of the economy, both in terms of scenario conditions and in terms of forecasting the overall indices.

Thus, a significant gap has appeared between the actual and estimated figures of the key macroeconomic indices (especially, at a time of economic crisis). The imperfection of the approach based on the MED forecast became apparent to an even greater degree during the period of declining oil prices and the development of the crisis in the real sector of the Russian economy, when the government, due to entirely understandable reasons, lagged behind with the publication of the forecasts. In the autumn of 2008, such a situation significantly complicated the operation of the subdivision of companies responsible for the strategic planning and development of business plans of companies for 2009.

Certainly, some segments of the business sector, contain subdivisions in their own structure, which deal with macroeconomic research (for example, banks or investment companies); however, they either pay more attention to analyzing the global and the American economy, or some sectors of the Russian economy. At the same time, in their studies, one rarely comes across a complex analysis of the prospects of Russian economic development. Such a state of affairs has occurred partly because the Russian stock market still extremely insignificantly depends on intraeconomic dynamics, and most companies simply have no resources for fundamental macroeconomic researches.

The use of analytical studies conducted by investment companies and banks can provide significant assistance to companies in the real sector in establishing their development strategy, but this does not render the development of ones own business views on the development of the economy less urgent. Otherwise, the possibility of an adequate response to increasing economic risks is lost, which has been especially clearly observed during the period of the acute phase of the economic crisis of 2008–2009.

At the same time, specialists who work in state structures in the sphere of the macroeconomy and governmental finance, have an extremely superficial understanding of business management. As a result, arguments of companies based on the estimates of financial flows traditional for business, and the analysis of possible risks, are often not heard. Besides, the operation of aggregates in prognostic-analytical activities, such as the type of economic activity, does not often permit one to consider the problem of the devel-

opment of one or other sector of the economy from the point of view of specific production problems, which are of a microeconomic nature, but are nonetheless just as significant. It seems that the problem can be solved by attracting persons knowing modern business mechanisms to governmental structures, but it does not remove the problem, as their knowledge in the sphere of macroeconomic mechanisms also has significant gaps.

Certainly, solutions can be reached at the level of discussions and analysis of the economic and budgetary efficiency of the decisions taken, however, it is clearly insufficient for adopting well-founded measures in the management of the economy. One needs to develop modern methodological approaches to the analysis of economic policy measures, reflecting the views of the problems of the economy's development, both from the point of view of the state and the interests of entrepreneurs. The business sector and the authorities need to aim at the maximum approximation of the approaches used for the estimation of the efficiency of management decisions.

In this respect, one needs to develop instruments for the analysis and forecasting of the national economic consequences of the adoption of the decisions in the sphere of the management of the economy, which allow one to monitor the whole chain of interactions, starting from a specific enterprise (or sector) up to and including macroeconomic indicators. Moreover, such models should generate both estimated figures, reflecting the development of the situation in the economic activity of the company, and figures on the level of large macroeconomic indicators, the budget, etc.

Analysis of the current practice of work of large Russian corporations shows that at present, the modeling of business processes aimed at the optimization of companies' activities is used almost everywhere. In these models, the economic activity of the company is examined in reasonable detail and financial flows are considered very thoroughly. It permits one to assert that the technology of analysis and planning in the corporate sector is developed at quite a satisfactory level.

As for modeling the economic dynamics at the level of macroeconomic and branch indicators, there are some certain problems. At the same time, there are some research centers, which deal with the development of such instruments, and at present there are functioning macroeconomic, interbranch, and industry models in the country. Such models are used in supporting the current work of governmental structures.

A radical decision of the task, concerning increased expert support in the adoption of decisions in the sphere of the management of the economy can be achieved by the creation (in Russia) of a developed system of forecasting, analysis, and examination of the

decisions taken. It seems to be an issue for the future. However, the search for coordination mechanisms of different levels of estimates and the development of relevant instruments are already in demand.

The methodological problem consists in the necessity of the integration of the approach to modeling used on the micro level, with the macroeconomic approach. Here, it is possible to act in different directions. In particular, one of the instruments permitting one to combine the macro- and microeconomic approach is the general equilibrium model (CGE). However, at the same time, the excessive tendency of these models to strictly follow the theory, as well as their attempts to describe the prevalence of general equilibrium in all markets, creates certain difficulties for the use of such instruments in practical prognostic-analytical activity, especially for estimates, aiming at a high level of detail of the description of processes occurring in some types of economic activity.

My position consists of the fact that one of the prospective directions in this sphere is the development of multilevel model complexes, including mutually connected models of different levels of detail.

The advantages of this approach are obvious. First, it permits one to coordinate the estimates of the prospects of economic development, both on the level of corporations and the macroeconomic level. Second, mutually connected estimates of the influence of the analyzed parameters on a wide range of macroeconomic and sectional figures are formed through closed calculations. The possibility appears to follow a whole chain of interactions existing in the modern economy.

It is necessary that the business sector "sees itself" in the system of macroeconomic analysis and forecasting. Thus, it is possible to include the real sector in the development of the key economic programs of development and overcome the skepticism of entrepreneurs, regarding the possibilities of complex macroeconomic policy.

The base of any instrument and model complex should be represented by the system of analysis and monitoring of relevant information. It appears that a balanced system of monitoring, analysis, and forecasting in the context of carrying out financial-economic activity of a branch or company should be based on a structured system of operation with information, accompanied by the development of modern prognostic-analytical instruments, integrated to the mechanisms of management decision making.

It should be noted that the analysis of information in the offered system is carried out at all levels of its formation, from financial-economic reports of companies to indices of the system of national accounts. Besides, such an approach to statistics ensures transparency of the indices formed at all levels, it permits one to deeply research the main factors affecting both the development of a company and an entire sector of

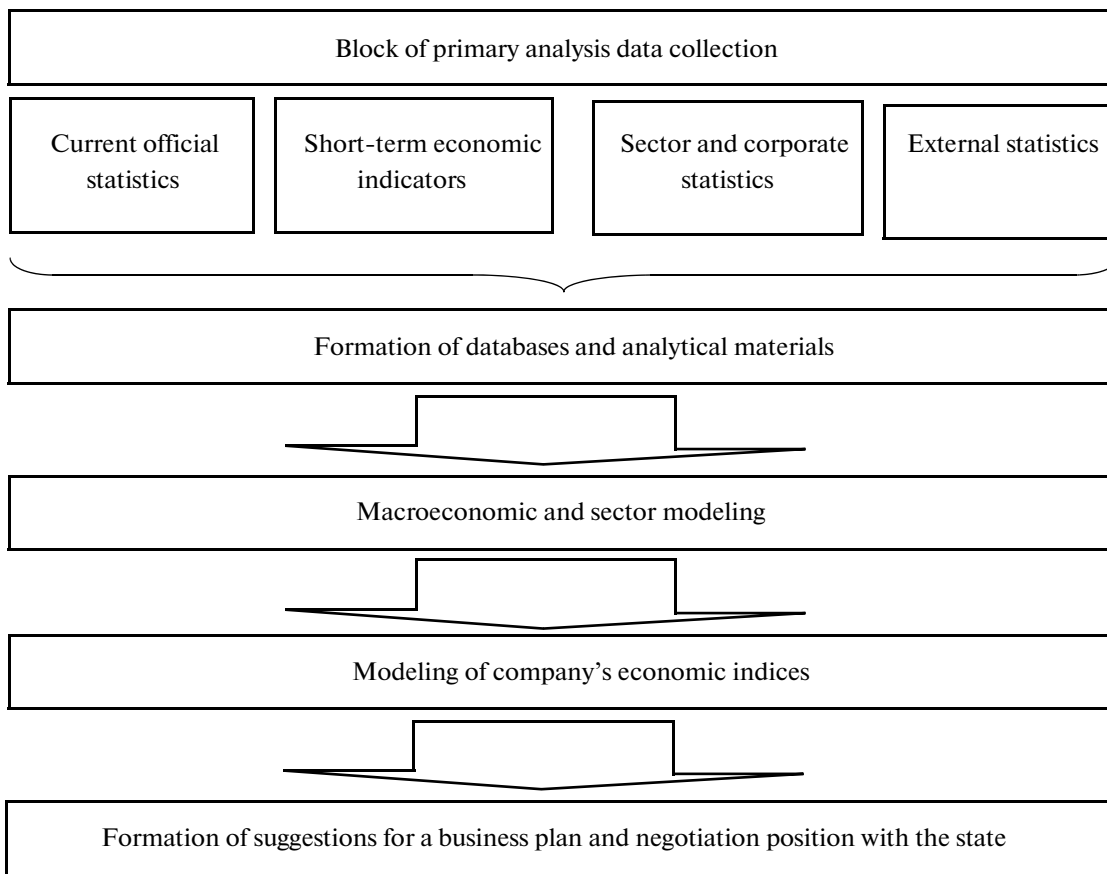


Fig. 1. Principal diagram of arrangement of information collection and analysis of corporationa (analytical center).

the economy, as well as estimate its contribution in the formation of key macroeconomic indices.

In Fig. 1, a possible arrangement of working with macroeconomic and branch statistics on the basis of a large corporation is set forth. Moreover, the possibilities of this system should be connected not only with the formation of suggestions for taking decisions on the company level, but also used during interactions with the state authorities, concerning a wide range of matters; in particular, they could include matters concerning the determination of the tax policy, the provision of state support to different types of activity, the determination of the policy in the sphere of subsurface use, and the power strategy.

Besides, the statewide transfer to some prototype of indicative planning permits large companies to be integrated directly in the chain of adoption of almost all management decisions at the state level. The necessary condition therefore should be the mutual comparability of indices represented by the state structures and business. Moreover, one needs to improve the approach to analysis and forecasting, based on the arrangement of information flows from a company level to the macroeconomic level.

Regular use and analysis of the official statistic data of the Federal State Statistics Service in the practical

activity of companies is a necessary condition for the use of multilevel prognostic-analytical instruments in the arrangement of a dialogue between business and the authorities. That is why the above-described system of data analysis and processing should be used not only by the business sphere, but more importantly, by the expert community and the executive authorities. The use of additional information sources will permit the experts dealing with the matters of the development and analysis of the economic strategy, to fill many gaps that exist in modern official statistics. The arrangement of an analysis and forecasting system at the level of some types of economic activity will also permit one to systematize the available official statistical flows in the specific surveys. In spite of all the difficulties, the Federal State Statistics Service provides a great deal of current statistical information and brings it to the notice of economists in the context of the Federal plan of statistical works. Moreover, the overwhelming part of this information is ignored by the majority of researchers, limited to the data of reference books in their activity.

At the same time, in macroeconomic studies, the problem of the interaction of the parameters of the development of the economy as a whole and separate types of economic activity is very acute and urgent.

The character of the development of the Russian economy assumes significant structural changes in the medium and long term. In this respect, the analysis of the prospects of its development becomes almost impossible without the use of structurally varied instruments, taking into consideration the dynamical and structural characteristics of the economy's development in a single package. Traditionally, structural analysis is connected with the use of instruments, based on interindustry balance. The use of such instruments is one of the main conditions of the elaboration of a generally consistent forecast of the economy's development in the medium and long-term perspective. However, as experience shows, even such a structurally rich instrument as the model of interindustry balance is often insufficient for some branch researches.

In the interindustry balance, the branches (types of economic activity) are represented by quite large assemblies. Moreover, developers of forecasts on this basis face the problem of the arrangement of branch subjects and the interpretation of the obtained results. Even in the monoproducer branches (oil, gas, and metal production), there are some large manufacturers with different strategies of business development. Therefore, it is impossible to describe adequately the prospective dynamics of a branch's development figures, without taking into consideration the implementation of the large investment plans of such companies. For example, it is difficult to forecast the development of the power industry, and therefore requirements of the economy of the key primary resources, without a clear view of the investment plans of the power generating companies. What can be the approach composed of in the development of a model complex, including the main indices of operation of the large business units? First of all, such an instrument should be multilevel; moreover, each level of calculation should be responsible for solving certain tasks in the general ideology of the model complex.

If we consider some economic and production complex (company), then the aggregate of companies forms the branch (type of the economic activity). Thus, the consideration of some companies as the key elements forming a branch makes it possible to form units, permitting one to pass on from the level of separate holdings to a calculation on the macroeconomic level.

The general view of the scheme of calculations in this complex can be represented as follows: on the upper level of the model complex, the macroeconomic forecast is formed on the basis of scenario conditions (developed both in the context of a certain cycle of calculations and on the basis of the current version of the official forecast of the MED). On the lower level, the aggregative branch forecast is formed, which in its turn is based on the results of the calculations of the financial-economic indices of some companies of the

branch. If a high level of detail is necessary, as well as, in the case of the presence of a large number of holding companies in the branch, the lower level of calculation can be disaggregated to the level of some business units. The general scheme of the model complex is set forth in Fig. 2.

It is necessary to pay attention to the fact that the suggested system of calculations is closed. The macroeconomic scenario and calculations on the upper level affect both the characteristics of the development of the branch and the development of companies and separate business units. Moreover, the macroeconomic calculations form the indices of demand for branch products and the price dynamics, both of manufactured products and consumed resources. In its turn, the models of companies form the aggregate model of the branch, affecting the calculation of the macroeconomic parameters.

The principal feature of the suggested complex approach is the necessity to use the calculations of the macroeconomic effects (of the upper level) of the MOB model.² The main advantage of the instrument describing the key interaction between separate sectors of economy lies in the fact that it permits one to carry out the coordination of the dynamic and structural characteristics of the economy's development. The adequate analysis of the affect of different types of economic activity on the development of the state economy, budgetary system, employment, etc., is impossible without it.

The represented model complex includes at least four levels, which causes a certain difficulty in its development and the necessity of going deeper into the peculiarities of the functioning of different levels of the economy. At the same time such an approach permits one to form a more complete impression about the functioning of some branches of the Russian economy, and survey the key interactions and factors affecting their development. Moreover, my position consists of the fact that the main attention should be paid to modeling the direct and reverse relations between separate calculation levels.

Let us try to examine the logic of calculations on different levels of the model complex of the functioning of a separate type of economic activity. Let us begin from the lowest level describing economic indices of some business units. Even when they are part of the structure of vertically integrated companies (VICs) or holdings, separate enterprises have a certain independence while carrying on business, key quantitative indices of business efficiency are characteristic for them, and therefore they can be considered as the base for calculations according to the industry model.

² A description of the possible structure of the interindustry model for the modern Russian economy can be found in publications of officials of IEF of the Russian Academy of Sciences [1, 2].

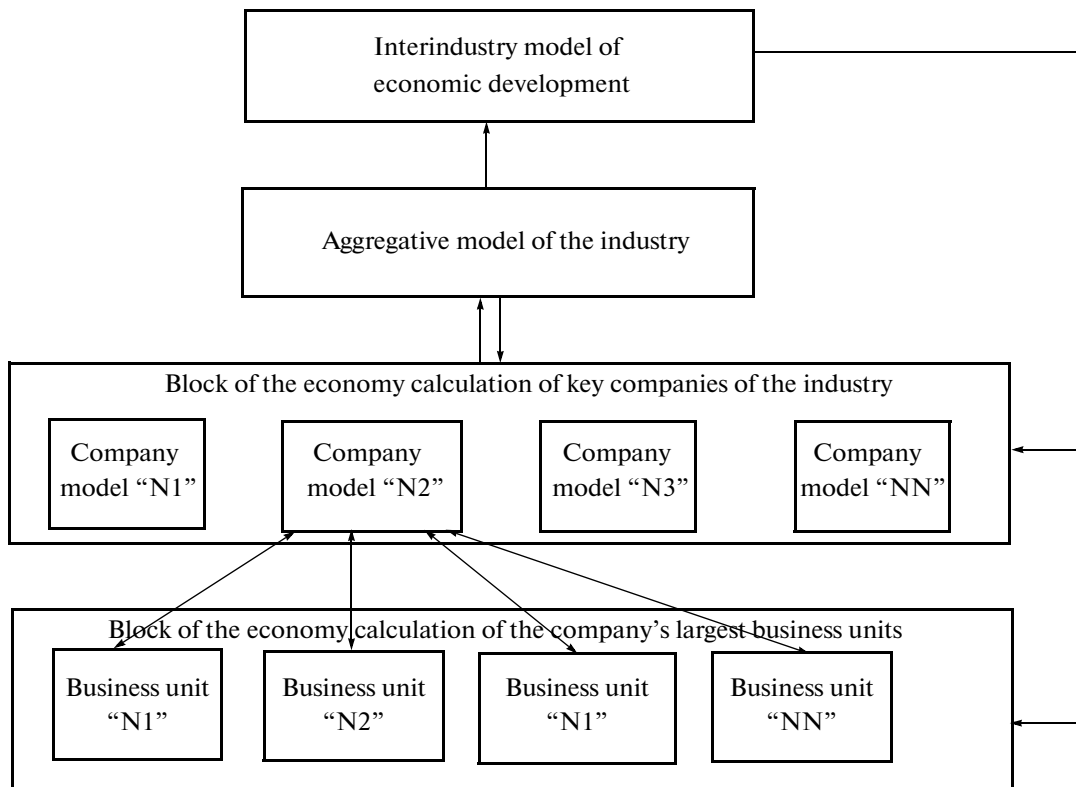


Fig. 2. Principal diagram of the forecast-analytical complex.

Certainly, all types of economic activities in the Russian economy have a different degree of business concentration. In some sectors (the fuel and energy industry, metallurgical engineering, the chemical industry), the number of enterprises is not too large, in others (textile production, foodstuffs, trade), it varies from hundreds to thousands. That is why at the first stage of the arrangement of the model complex, it is necessary to determine the list of units subject to modeling. In some cases, when the number of business units is too large, it appears that the lower level of calculations can be neglected and it is possible to base the modeling of the economy on some large holding companies or some types of economic activity.

How can the calculation system on the level of some separate business units look like? Evidently, it should reflect the key economic, production, and technological characteristics of business development. In this respect, the company's revenues should be formed in the model of the business unit, as well as the main characteristics of the expenditures (both operating and capital). Based on this data, the profit should be formed (free cash flow), which should finally determine the key parameters for the formation of the investment strategy.

For example, the level of the internal rate of return (IRR) can be used as a criterion for making an investment decision. I shall state some provisions of the the-

ory and practice of investment analysis to understand the significance of this parameter in the determination of the necessity to invest funds in production development.³

The investment process is considered as one of the key business directions, solving some of the most important tasks of reproduction, the removal of available labor and capital limits, and the formation of conditions to maximize profit. In making a decision, one needs to estimate the efficiency of investments as compared to alternative ways of investing the funds available. For this purpose, the generally accepted methods of estimating project efficiency are applied in investment analysis. The following parameters of these methods can be considered as the key ones:

1. Cash flow (PV).
2. Net present value (NPV).
3. Profit on sales of products (P).
4. Internal rate of return of capital investments (IRR).

Let us consider each of these indices.

The net cash flow (PV) is the profit, taking into consideration amortization after deduction of the

³ For more detailed information of the principles of investment analysis, see the relevant literature [3, 4].

investment amounts. This index is calculated by the following formula:

$$PV = \sum (P_t + A_t) - K_t, \quad (1)$$

where PV is the cash flow during the year t ; P_t is the profit on sales of products for the year t ; A_t is the amortization for the year t ; and K_t are the capital expenditures for the year t .

One needs to pay attention to the fact that the net cash flow is the main source of investments of future periods for the development of new projects by means of the company's own funds, and also defines the profits of shareholders from dividend payments.

The net present value (NPV) is the profit on the sales of products, taking into consideration amortization after deduction of the investment volume and is defined as the sum of the current annual flows reduced to the initial period of time.

$$NPV = \sum_{t=1}^T ((P_t + A_t) - K_t) / (1 + E_n)^{t-tp}, \quad (2)$$

where NPV is the net present value; E_n is the discount rate; t_p is the settlement year.

The calculation of the trading profit (P) (the total revenues after deduction of expenditures for production, amortization, taxes) is carried out by reducing the term to the initial period of time:

$$P_t = \sum_{t=1}^T (R_t - A_t - T_t - C_t) / (1 + E_n)^{t-tp}, \quad (3)$$

where R_t is the revenue from the sales of products; P_t is the profit on sales of products; T_t is the sum of taxes paid; C_t is the total expenditure.

Finally, let us define the internal rate of return as the minimal discount rate, at which a breakeven result will be provided.

Let us define the equality to solve this task:

$$\sum_{t=1}^T ((P_t + A_t) - K_t) / (1 + IRR)^{t-tp} = 0. \quad (4)$$

The internal rate of return obtained from equality (4) is required first of all to make the investment decision as it is compared to funds invested in other business spheres. In this respect, it is necessary to consider that in a market economy, the behavior of economic agents is subject to certain rules. The above-described methods of investment analysis have become ingrained in the economic practice of Russian companies. That is why it is difficult to expect an increase of capital investments in economically unattractive projects in the business sector. It is extremely important in evaluating the motives of business decisions in crisis situations. In conditions of a deterioration of the financial-economic state of companies,

support for economically unattractive assets (for example, out-of-date enterprises in a single-industry town) is extremely unlikely without the adoption of additional measures of business support on the part of the state in the form of financial assistance or tax and other preferences.

In these conditions, the actions of the state on the reduction of interest rates are quite adequate as this action naturally increases the rate of return and raises the tendency of the business sector to invest. However, D. Keins [5] highlighted the desirability of reducing interest rates within a crisis period.

However, even within periods of relative economic stability, the adoption of an investment decision is a crucial point for a business, for which entire departments of companies work over a long period of time. An externally attractive business direction can be quite devoid of investment resources due to half-assessed measures of the economic policy in the taxation sphere or state regulation. Moreover, it makes no difference whether it is a question of the production of oil, gas, or metal smelting. If business negatively estimates the possibility to obtain profit from investments in these externally attractive activity directions, then, there is no point in counting on significant growth of investments. A reduction of investment activity, especially in strategic sectors of the economy, leads to increased restrictions on economic development.

Certainly, a reduction of business investment activity can be compensated to some extent by means of state resources. However, first, state resources can be used in more urgent directions than financing the commercial activity of some enterprises and, second, the finite amount of state resources makes the mass support of capital intensive projects impossible.

Thus, decisions of the state in the sphere of economic policy can directly affect the creation of an investment climate. In this respect, it is important to maintain a certain balance during the reassignment of funds; one needs to estimate the influence of long-term measures of the tariff and nontariff regulation of foreign trade, as well as the current tax system on different sectors of the economy, and the timely adoption of relevant decisions, correcting the current system.

The criterion on which investment decisions are made in the business sector is one of the key points of the offered method. The companies can apply either their own funds or borrowed assets as the investment resource. In case of the attraction of borrowed assets, one needs to estimate the efficiency of their attraction and the possibility of servicing the consequent obligations. Moreover, as the Russian practice shows, the own funds of an enterprise or the resources of larger organizations are of crucial importance for the amount of investment in the capital stock. Thus, independently of the fact whether own or borrowed funds are applied, it is necessary to calculate the net cash flows.

Modeling of financial-economic activity on the level of the type of economic activity, holding, or company assumes some simplifications, in order to, on the one hand, avoid an unnecessary level of detail complicating the model and, on the other hand, concentrate on the most significant connections and dependences, defining the results of the financial-economic activity.

The basis for the determination of the cash flow is the revenue. If we consider the model of separate companies, then, as a rule the revenue can be formed from two main directions: export supplies and the domestic market. Several key suppositions can be used for the determination of the distribution of product supplies in the two directions. First, the directions of the supplies can be specified according to the estimated scenario. Second, domestic demand can be modeled, taking into consideration calculations according to the interindustry and macroeconomic model, and export supplies can be defined on the basis of the balance of production. Third, it is possible to define the priority direction of supplies, depending on economic efficiency, taking into consideration the foreign trade conditions and customs tariff. Each of the described approaches can be applied, depending on the peculiarities of the modeling object. In particular, the first method is suitable for calculating the short-term and medium-term prospect to the maximum extent, as well as in those industrial sectors, where the share of export supplies is insignificant. The disadvantage of the second method is that in conditions of a reduction in domestic demand (with the production level unchanged), the export flow increases automatically. Such a mechanism can be used in sectors, manufacturing products competitive in foreign markets, and in conditions of stable external demand. The third method is the most complicated one. Its application is reasonable while developing long-term models, in those sectors of the economy, where there is a possibility of maneuvering resources between the foreign and domestic markets. In order to achieve this, a development of dependences is required, connecting the direction of supplies with the dynamics of the customs tariff, the world price level, and demand in the global markets. Moreover, this approach can be used in those types of economic activities, where the level of domestic prices is comparable to the global level, except for expenditures for export duties and transportation (the netback principle). At present, such sectors are metallurgical engineering, the oil and gas industry, and the chemical industry. Certainly, the suggested approaches are a kind of simplification, when compared to how directions of product supplies are considered by the financial-economic services of companies in the online mode, but they can be easily applied to solve the tasks in the model complex.

Estimation of the revenue from the sales of products creates the basis of forming the final financial result. As is well-known, financial results are formed by the difference between revenues and expenditures.

That is why it is necessary to calculate the main cost items. Expenditures can be divided into two principle constituents: operational and capital. Let us study the possible methods of forecasting them in detail.

Operational expenses directly affect the profit ratios. The following items should be referred to as operational expenses: costs for material procurement, remuneration of labor, taxes, transport costs, and energy costs. As the experience of constructing models of industry sectors and companies has shown, the above-mentioned list is the minimum required for a reasonable description of the dynamics of operational expenses.

In respect to modeling the economy of a corporation or business unit, the most complete idea of the dynamics and structure of costs can be obtained from the relevant statements of the company. During aggregation of the data to the industry model or construction of the model on the level of some type of economic activity, the respective forms of statistical monitoring, reflecting the structure of costs (1 is an enterprise (annual) and 5-z (quarterly)) can be information sources.

During modeling of the operational expenses, one needs to pay attention to the fact that almost all of them are directly connected with production volumes. Thus, the production program represents the basis for calculation of almost all elements of the operational expenses. Moreover, as a rule, the operation costs are divided into controlled and uncontrolled costs. Uncontrolled costs are traditionally considered as expenses, which the company's management cannot influence. Such costs include taxes, transport costs, and other fixed costs. As a rule, in modeling costs, the methods of correlation-regression analysis are applied, as well as a thorough analysis of the statistics of companies and the considered industry sector as a whole. Now, let us consider approaches to modeling the basic elements of operational expenses.

Costs for raw and other materials (intermediate products) are amongst the most significant cost items. During the analysis and modeling of this cost item, one needs to consider the current level of the company's materials consumption and analyzed type of economic activity according to the key directions, in which these intermediate products are used. The main factors affecting the costs are the volume of manufactured products and the change in the prices for the key types of raw and consumable materials. Moreover, the problem consists in obtaining the forecast information about the dynamics of the prices for the intermediate products. With respect to processing fresh raw materials, one can use indicators, reflecting the dynamics of prices for oil, gas, metals, and other raw materials included in the MED forecasting projects or analytical documents of global agencies. For other types of intermediate products, one needs to use more general deflators. In particular, the predicted values of defla-

tors by types of economic activity are contained in the medium-term social-economic forecast of the MED.

One can use dependences on the production volume and electric power tariffs for modeling electric energy costs. At present, price formation in the electric power sector is carried out both according to regulated and market prices. In future, market mechanisms will probably prevail with respect to price changes of electrical energy. Nevertheless, due to their high significance, tariff dynamics will continue to be overseen by the state. In this respect, it is reasonable to use MED forecasting projects for modeling both regulated tariffs and the dynamics of the average tariff of the economy. Besides, this flow can be corrected, depending on a possible reduction of the specific electric capacity by including investment activity indices in the calculations.

As for transport expenses, the value of their flow can also be modeled on the basis of the average tariff forecast by the official structures. In the regular MED forecasts, the price indices for railway transportation are available. At the same time, the transportation of freight in separate industry sectors can be carried out by different kinds of transport, which should be considered in the course of modeling. In the general case, expenses for the transportation of freight can be calculated as a product of the volume of transported products and the tariff and transportation range. Moreover, the transportation range in the medium term can be set on the basis of the analysis of the company's current logistics. In particular, with respect to VICs, there is a rigid tie of enterprises producing raw materials and finished products, which should be considered in calculating transportation costs. At the same time, the division of transport costs into domestic and export constituents is required in all types of activities with a significant component of export supplies. It allows us to consider possible changes in the directions of product supplies.

Tax payments make up a significant part of the costs of manufacturers. Here, it is necessary to reproduce the existing tax system in maximum detail. Moreover, the analysis of factors affecting tax exemptions is required. Many factors can affect the tax burden level. For example, if types of activities, dealing with mining operations are considered, then, payments for subsurface use make up a significant share of taxes. In the export-oriented sectors, attention should be paid to mechanisms for the formation of export duties and VAT repayment. The calculation of social taxes, as a rule, is carried out on the basis of the payroll amount.

While calculating the value of tax payments, one needs to consider the fact that in the analysis of economic sectors or large corporations, the cases of 100 percent tax collection in practice do not take place. To estimate the "natural" level of collection, one has to analyze retrospective statistics, with the

purpose of obtaining the average level of the underlying tax collections in recent years or carry out deeper research on factors, affecting tax levies (preferences and structure of costs, etc.). For example, in the case of the consolidated social tax, the salary level is significant as it directly affects the taxation rate.

In modeling the salary fund, one needs to consider the range of production activities, key indices of the efficiency of the use of the labor force, the possibility of substitution of capital for labor, etc. The requirement in personnel is formed on the basis of these estimates. Moreover, the estimate of the dynamics of the monthly average accrued salary has a significant value. In calculating the monthly average accrued salary, one needs to orient both to the general dynamics of prices in the economy, changes in the volume and profit of manufactured products, and the place of the considered economic sector in the labor market. In the general case, rapid salary growth coefficients can be applied to sectors with the smallest initial level of salary. For example, salaries in the textile and garment production sector are significantly lower than in the crude oil production sector. That is why there is a potential of rapid salary growth in the textile production in the medium term. However, this does not mean that there is a possibility to equalize salary levels in two the mentioned sectors in the foreseeable future. At the same time, assuming good financial results, one can use the hypothesis of rapid "overtaking" salary growth in textile production.

The total sum of operation expenses (OPEX) is deducted from revenues, thus forming the profit before taxation, then, after deduction of the profit tax, the net profit is formed. It should be noted that during the modeling of indices for the sector, we do not obtain the profit directly, but the balanced financial result, i.e., the sum of the profits of profit-making enterprises and the losses of loss-making enterprises. This should be taken into consideration during the modeling of the profit tax. Otherwise, the result can be significantly understated.

The received net profit represents the source of investments in the capital stock. The total amount of investment (CAPEX, capital expenditures) in the development of production should be defined in coordination with the production capacity and the capacity utilization level, on the basis of the selected criteria of adopting the investment decision. It is crucial to determine the amount of investment in the capital stock. The situation may well arise, when the criterion for adopting the investment decision will be exceeded, and the resources of monetary funds will permit the management to significantly increase investment in the development of the enterprise. To define the upper bound of investments, one needs to estimate the potential of the demand for the manufactured products. Thus, we obtain the upper bound of the amount of investment in the capital stock. As for the lower

bound, it is defined by the parameters of the available financial resources and the efficiency of the investment in the capital stock. In the analysis of the necessary amount of investment, one needs to estimate the possible dynamics of the capital capacity, the level of utilization of the production capacity. For example, in the extractive industries, the level of the capital capacity can be connected with the criterion of the reserves of natural resources and the technology used for their extraction.

Having the data on operational and capital expenses, allows one to estimate production efficiency, both for a certain year and certain periods of time, and analyze principle factors affecting the final calculation results.

A more detailed description of the production and financial issues regarding the functioning of some types of economic activity should also affect the relevant quality of the calculation on the macroeconomic level. A detailed description of the type of economic activity will permit one to carry out a more thorough estimation of the production capabilities of some sectors and the economy as a whole, and define the key limitations of the long-term development.

It stands to reason that the financial-economic activity of any company represents an interaction of processes that differ in significance, whose detailed description poses a significant problem. At the same time, the represented approach permits one to create a kind of "production function" of business development, demonstrating the possible influence on the operational parameters of the type of economic activity, holding, or company on the part of macroeconomic indicators and parameters of the economic policy. Besides, the described method permits one to create the minimum necessary basis for further improvement of the calculations and an extension of the list of forecasted indices.

The approach described in this paper cannot solve all the problems of industrial modeling. It appears that the construction of a system, where all economic sectors will be modeled on the basis of the analysis of production-economic activity is impossible. A great number of problems will arise in relation to the coordination of the system of calculations, accounting for the

types of economic activity with a significant share of the budget sector, etc.

At the same time, the creation of industry models, reflecting the development of the most important types of economic activity will permit us to significantly extend the possibilities of traditional macroeconomic and interindustry instruments, obtain detailed estimates of possible dynamics of production and investment according to separate types of the economic activity, and finally create prerequisites for improving the quality of the developed strategies and programs, both for separate sectors and for the national economy as a whole.

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