LONG-TERM FORECASTING OF S&T AND INNOVATION INDICATORS

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Current practices of forecasting S&T and innovation in Russia

1) Research is focused on particular (not general) problems

2) Relationships between the parameters of development of national innovation system (NIS) and the macroeconomic indicators are often not taken into account

3) Interactions between NIS elements are often not taken into account

4) Domination of quantitative methods

5) Lack of an integrated approaches

6) Focusing on traditional economic criteria and quantitative estimation

Problems of S&T and innovation forecasting in Russia

1) Existing approaches provide limited contribution to policymaking

2) Lack of integration with the overall system of socio-economic forecasting

3) Underestimation of systemic effects of NIS development

4) Lack of use of qualitative characteristics

5) Insufficient coherence of required resources and envisaged results

6) Integrated estimates are difficult to achieve on the basis of existing practices

7) Limited opportunities for assessment on potential social effect
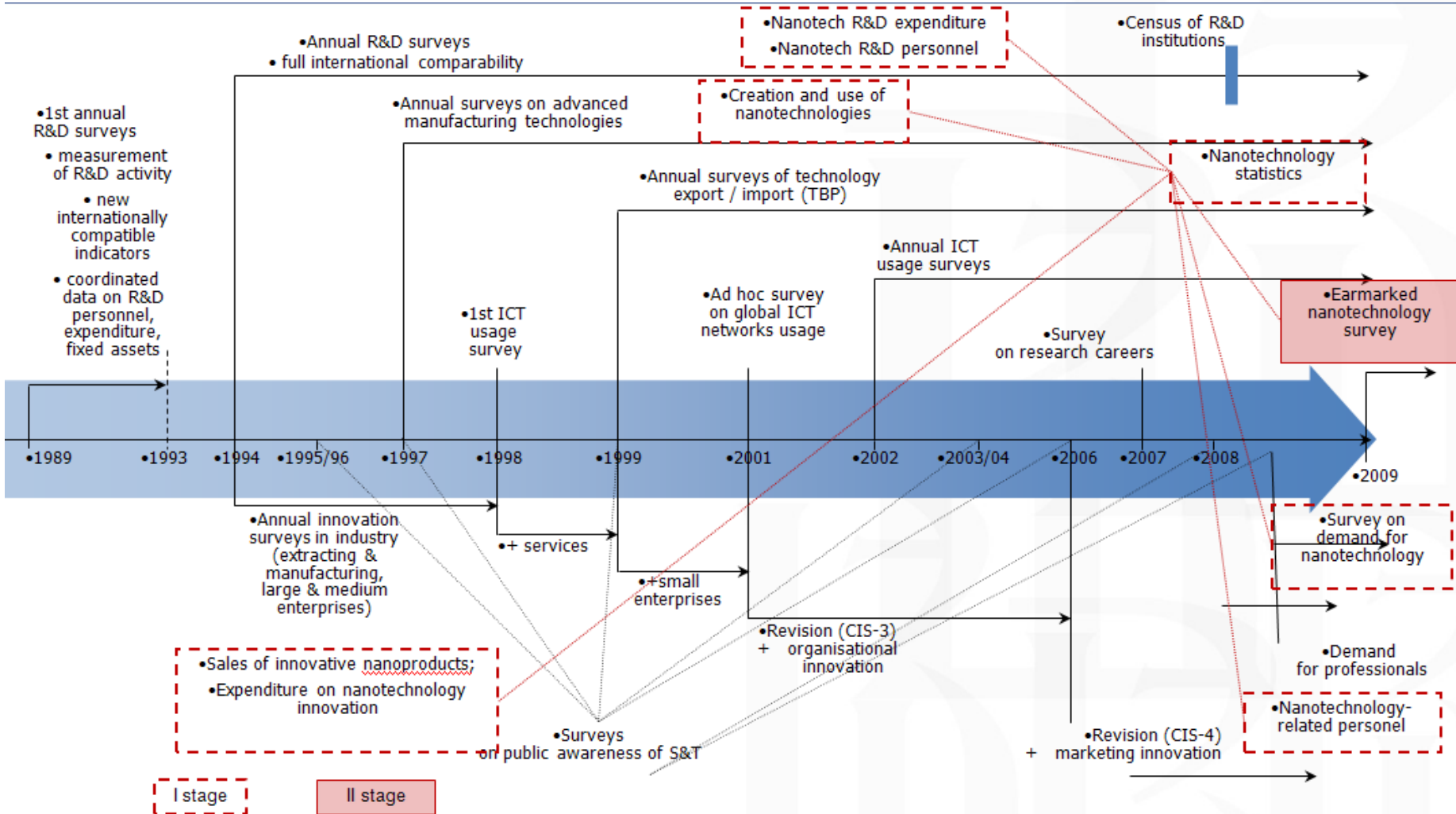
System of forecasts of development of science and innovation system in Russia

- Concept of long-term socio-economic development of the Russian Federation till 2020

- Main parameters of the forecast of socio-economic development of the Russian Federation for 2020-2030 years

- Basic directions of activity of the Government of the Russian Federation

- Concept of the long-term forecast of S&T development of the Russian Federation till 2025.

- Strategy of the Russian Federation in the field of science and innovation development till 2015

- Federal targeted programme "Research and development in priority S&T area" for 2007 - 2012

- Targeted programmes of government agencies

- Long-term and medium-term sectoral strategies

- Reports on results and the basic directions of activity of the subjects of the budget planning.

Macroeconomic forecasts +
S&T and innovation forecasts

Unified system of forecast calculations

ORGANIZATION

1) Integrated   methodological approach

2) Integrated complex of models

3) Integrated information base

METHODOLOGIES

1) Consistency of volume and structural indicators of NIS development with macroeconomic forecasts and relevant resource indicators

2) Methods to Increase of reliability and validity of developed forecasts

3) Systemic approaches

4) Targeting demand for planning and management in S&T and innovation

5) Forecasting resource indicators for planned policy goals

New approaches

1) • Integration of quantitative and qualitative methods (expert assessments, methods of statistical modeling and forecasting and Foresight methodology)

2) • Use of international statistical standards of the System of National Accounts

3) • Adaptation of modern methods of assessment the performance of NIS

4) • Creation of an easily renewed and updated information base

Envisaged results

1)
- Forecasts of major parameters of S&T and innovation

2)
- Trajectories of achievement of target indicators

3)
- Forecasts of performance parameters

4)
- Forecasts for resources to be provided

Analysis and systematization of international experience

Conceptual apparatus :
- the recommendations of international organizations

Hypotheses on the relationship of NIS elements

Methodological approaches to the complex forecasting:
- multi-factor models
- formalized methods of forecasting
- matrix models
- specialized methods and models
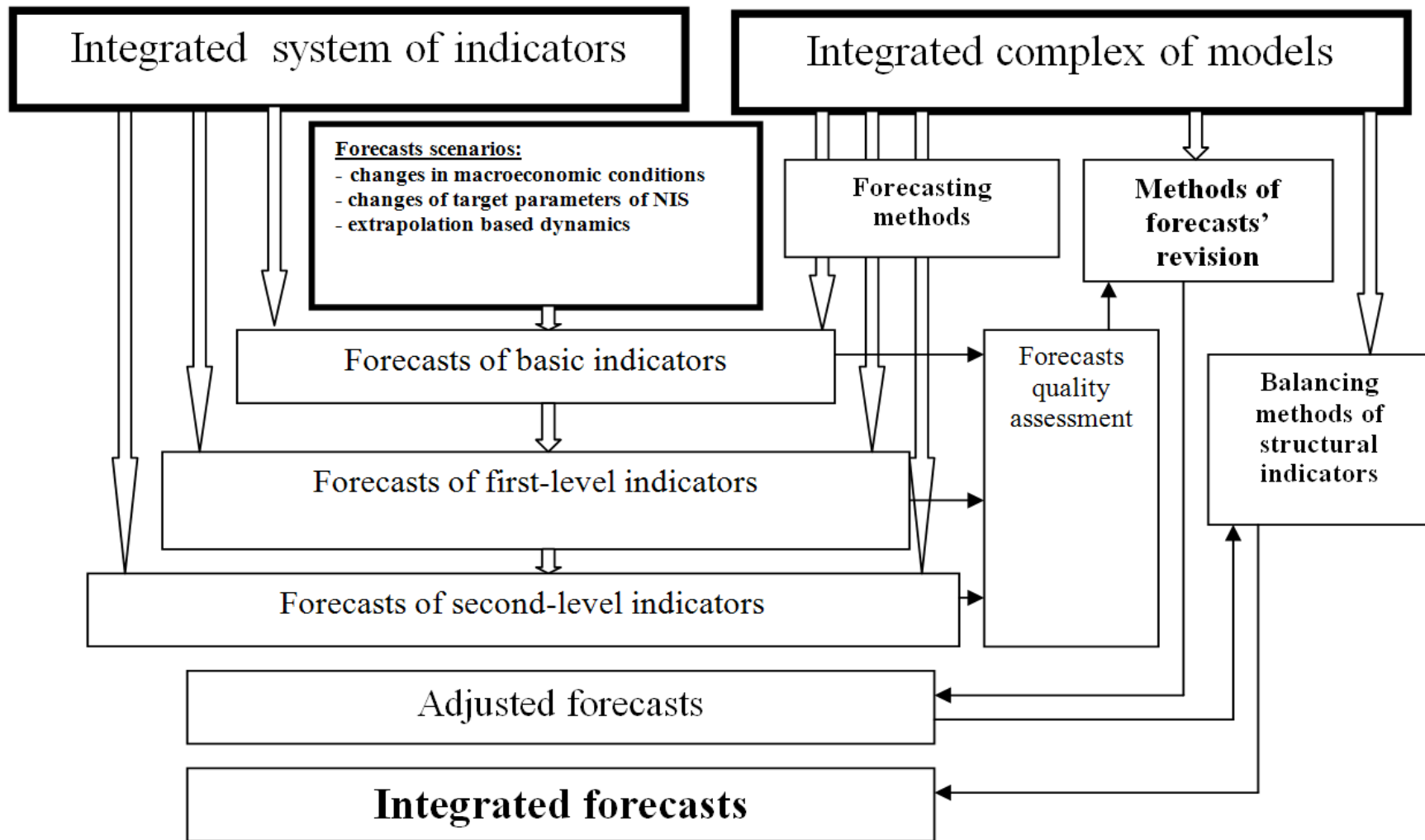
Identification of the object of forecasting :
-the institutional structure of NIS,
- functional structure of the NIS,

Approaches to analysis and forecasting NIS elements

Structured system of indicators:
- Eurostat database
- OECD database

Information base

Statistical data

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HSE Information-analytical system "Statistics and monitoring of economics of knowledge: science, innovation, education, information society"

- **Formation of the original time series**
- **Adjustment of indicators with basic macroeconomic data**
- **Restoration of the information**
- **Updating of parameters of the forecast models**

Macroeconomic indicators

1) GDP

2) Federal budget revenues

3) Federal budget expenditures

4) Investments in fixed capital

5) Volume of industrial production

6) Exports of goods and services

7) Profit for all activities

8) Allowances for depreciation (for all enterprises)

9) Wages

10) Nominal gross average monthly wages per one employee

Indicators of S&T sector

Input indicators

1) Number of organizations involved in R&D units
2) Number of employees engaged in R&D
3) Number researchers
4) Average annual value of fixed assets of R&D organizations
5) Gross domestic expenditure on R&D
6) Share of domestic expenditure on R&D in GDP
7) Allocations for civil science from the federal budget

Output indicators

1) Volume of work performed on research and development
2) The average monthly salary of R&D personnel
3) Granted patents for inventions with an indication of Russia
4) Granted patents for useful models with an indication of Russia
5) Number of scientific papers published by Russian authors
6) Share of scientific papers written by Russian authors in the international co-authorship
7) Total citation index of scientific papers written in Russian
8) The share of scientific papers written by Russian authors, in world number of scientific papers

Indicators of innovation sector

Input indicators

1) Expenditure on technological innovations (TI)
2) Number of organizations performing TI
3) Share   of organizations performing TI, in total number of industrial organizations
4) Number of R&D departments in organizations performing TI
5) Number of employees in these units

Output indicators

1) Volume of shipped innovation production
2) Share   of innovative production in the total volume of industrial production
3) Volume of export of innovative products, works, services
4) Share   of export of innovative products in total volume of exports of goods and services
5) Revenues from the export of technologies
6) Number of created advanced technologies
7) Number of used advanced technologies

- Adjustment of integrated forecasts of S&T and innovations to changes in macroeconomic conditions

- Adjustment of integrated forecasts of S&T and innovations to changes in changes of target indicators

- Monitoring of NIS based on the limited set of key indicators

-Expert assessment of feasibility of target indicators

- Development of short- and medium-term target indicators of NIS development on the basis of analysis of strategic macroeconomic trends

**Thank you
for your attention!**

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