

**World Conclave of Scientists on
Regional Co-operation in
Science and Technology:
Opportunities and Challenges in the
Context of Globalization**

Edited by
Mohsin U Khan



ZAHEER SCIENCE FOUNDATION
4, Udyan Marg (Near Gole Market)
New Delhi - 110 001
INDIA

Institutional Prerequisites of Innovative, Technological and Structural Dynamics (Russian Case)

Rustem Nureev

State University - Higher School of Economics Moscow, Chief of the Department of
Economic Analysis of Markets and Organizations, Professor

1. Russian economic specialization: light and shadows

The economic crisis has uncovered three negative Russian tendencies that created institutional obstacles for market economy growth during the last decade: deepening of raw materials specialization, wear and tear of the equipment, gap in scientific and technical progress, and strengthening of the government. To stop these negative tendencies and overcome economic crisis it is necessary to reform developed institutes.

Russia ranks first in the world in natural gas production, oil extraction, holds the second place for potatoes and the third place - for wood, bricks, meat and poultry, cast iron and sugar beet (see Table 1).

Table 1 — Russian position in the world production (2006)

Types of industrial and agricultural production	Russian position
Natural gas, Oil extracted	1
Potato	2
Wood, Bricks, Meat and poultry, Cast iron, Sugar beet	3
Electricity, Steel, Finished steel of ferrous materials, Mineral fertilizers, Cotton, Grain crops	4
Iron ore, Cement, Milk	5
Coal, Saw timber, Meat and poultry	6
Cellulose, Butter	7
Fishing	8
Woolen fabric, Footwear	10

In 2007 Russia accounted for 2.2% of the world population. However, for some types of commercial products its contribution to world production is significantly higher than its share in world population: 27.2% of world natural gas production, 12.6% of global oil production, 6% of global iron ore production and 5% of world coal production (see Table 2).

Table 2—Russia in the world production (%)

	1995	2000	2007
Average population size, percent Production	2.6	2.4	2.2*
Oil (including gas condensate), ton	9.9	9.7	12.6
Natural gas, m ³	27	23	27.2
Coal, ton	5.7	5.7	5
Iron ore (commodity), ton Industrial goods production	8.5	9.1	6
Energy:	6.5	5.7	5.3
Cast iron, mln. ton	7.6	7.7	7
Steel, mln. Ton	6.9	7	6.2
Cars (including assembly)	2.1	2.3	2.4
Fertilizer, mln. ton	7.1	8.5	9.3
Wood (removal), mln. m ³	3.6	2.8	3.3
Timber, mln. m ³	6.5	5.3	5.3
Paper and cardboard, mln. ton	1.5	1.6	2
Cement, mln. Ton	2.6	2	2.1
Cotton fabric, m2	1.9	2.7	3.5
Woolen fabric, m2	2.8	2.4	2
Footwear, pairs	1.3	0.9	...
Sugar (made of domestic materials), mln. ton	1.8	1.3	1.4
Fishing and other seafood, mln. ton	4.2	4	3.2

* - 2005; Source: Calculated on the database of Mineral Commodity Summaries and Rosstat

Russian position is also a visible one in the production of fertilizers (9.3% of world production in 2007), iron (7%), steel (6.2%), electricity (5.3%), lumber (5.3%) and cotton fabrics (3.5%, see: Table 2). Year after year, the share of Russia in the global car assembling

structure of its exports. If in 1995 mineral products accounted for 42.5% of all Russian exports, then in 2008 their share grew to 69.6%, while the share of machinery and equipment fell almost 2 times - from 10.2% up to 4.9% (see Table 3).

Table 3—Export commodity structure in Russian Federation, 1995-2008 (%)

	1995		2000		2005		2008	
	100	100	100	100	100	100	100	
Total export								
including:								
Foodstuffs and agricultural materials (except textile)	1.8	1.6	1.9	2.0				
Mineral products	42.5	53.8	64.8	69.6				
output of chemical industry, rubber	10	7.2	6	6.5				
tanning materials, furs and fur products	0.4	0.3	0.1	0.1				
wood and paper products	5.6	4.3	3.4	2.5				
textile, textile products and footwear	1.5	0.8	0.4	0.2				
metals, precious stones and products which are made of it	26.7	21.7	16.8	13.3				
machines, equipment and means of transport	10.2	8.8	5.6	4.9				
Other goods	1.3	1.5	1	0.9				

Source: The Federal Customs Service of Russia

On the contrary, in the recent years imports of machinery, equipment and vehicles greatly increased (from 33.6% in 1995 to 52.7% in 2008) and products of chemical industry and rubber rose from 10.9% in 1995 to 13.1% in 2008 (See Table 4).

Table 4—Import commodity structure in Russian Federation, 1995-2008 (%)

	1995		2000		2005		2008	
	100	100	100	100	100	100	100	
Import - total								
including:								
Foodstuffs and agricultural materials (except textile)	28.1	21.8	17.7	13.2				
Mineral products	6.4	6.3	3.1	3.1				
output of chemical industry, rubber	10.9	18	16.5	13.1				
tanning materials, furs and products which are made of furs	0.3	0.4	0.3	0.4				
wood and pulp and paper products	2.4	3.8	3.3	2.4				
textile, textile products and wear foot	5.7	5.9	3.7	4.4				
metals, precious stones and products which are made of it	8.5	8.3	7.7	7.3				
	33.6	51.4	44	32.7				

The problem is worsened by the fact that Russian natural resources (including both oil and gas) will soon be exhausted. Russia's oil reserves will be sufficient only until 2030. The level of reproduction of oil and condensate continues to lag behind the volume of their production. In 2002 oil reserves amounted to 254 million tons (production - 380 million tons), in 2003 - 240 million tons (production - 421 million tons), in 2004 - 440 million tons of oil were produced.

CIS countries have enough oil for 30 years, gas - for 70 years and coal - for 460 years [counted if there will be no change in consumption level (see Figure 1)].

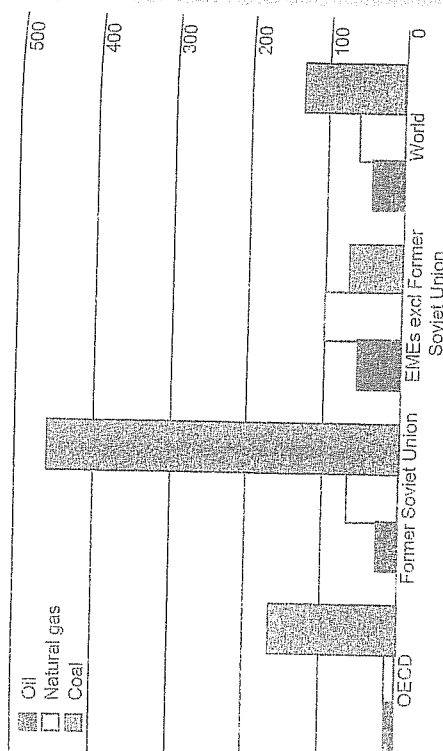


Fig. 1. Fossil fuels (oil, natural gas, coal). Reserves-to-production at the end 2007

Sources: BP Statistical Review of World Energy, 2008

Most OECD countries have enough coal for 170 years, and the rest of Europe and Asia - enough gas for 100 years, oil for 60 years and coal - for 70 years. In terms of natural energy resources exploitability the role of other resources (especially human capital) has increased.

This analysis allows to draw at least two conclusions. First, it is necessary to use financial resources, derived from the sale of oil and gas, to modernize Russian economy and to overcome its single-crop specialization. Second, it must be done so in the nearest future, as it becomes difficult to maintain oil and gas production even at the same level.

2. The level of Russian innovative development

The effectiveness of investing in science influences the way innovations are introduced. Innovation possibilities index consists of five interrelated indexes:

- Scientists and engineers index,
- Innovation policy index,
- Cluster environment index,
- Connection with universities index
- Companies' activities and strategies index.

Relative position of Russia in comparison with other countries is shown in the Table 5.

Table 5 - Innovation possibilities index: comparative position of Russia in 2004

Place	Scientists and engineers index	Innovation policy index	Cluster environment index	Connection with universities index	Companies activities and strategies index
40	Italy	Greece	Morocco	Indonesia	Southern Africa
41	Latvia	Czech Republic	Russia	Portugal	Lithuania
42	Romania	Lithuania	Nigeria	Egypt	Mauritius
43	Argentina	Slovakia	Cyprus	Uganda	Egypt
44	Mozambique	Botswana	Bahrain	Turkey	India
45	China	Namibia	Turkey	Russia	Poland
46	Costa Rica	Bahrain	Estonia	Hungary	Jordan
47	Egypt	Italy	Ukraine	Jordan	Hungary
48	Tobago	Mala	Mexico	Jamaica	Mexico
49	Chili	Jordan	Slovenia	Bahrain	Tunisia
50	Cyprus	Chili	Lithuania	Costa Rica	Estonia
51	Macedonia	Morocco	Costa Rica	Greece	Portugal
52	Indonesia	Croatia	Philippines	Trinidad and Tobago	Pakistan
53	Mauritius	Serbia	Kenya	Tobago	Panama
54	Tunisia	Tanzania	Panama	Panama	Botswana
55	Morocco	Uganda	Greece	Namibia	Morocco
56	Barzil	Egypt	Mauritius	Madagascar	Thailand
57	Tunkey	Gambia	Czech Republic	Mali	Thailand
58	Uruguay	Russia	Colombia	Vietnam	Trinidad and Tobago
59	Malaysia	Trinidad and Tobago	Nambia	Botswana	Subrador
60	Vietnam	Mali		Tanzani	China

Source: PORTER M, KETELS K. (2007): Competitiveness of the Cheesroads: Changing the Future Direction of the Russian Economy. Moscow, p.56

In terms of innovative capacities Russia took a total 35th place. However, it is characterized by a strong variation between the indicators that make up the index (see Table 6). The Scientists and engineers index value for Russia is the 9th highest in the world, the Cluster environment index - 41st, the Connection with universities index - 45th, the Innovation policy index - 58th, and the Companies activities and strategies index -

Table 6—Target macroeconomic indexes of Russian economy development till 2020 year (2007=100)

	2012	2017	2020
GDP growth	135-136	137-139	119-122
Labour productivity growth	137-139	142-144	121-124
Decline in power-consuming of GDP	83-84	80-82	88-91
Increase in real disposable income	148-150	137-140	120-123
Investments	167-170	165-168	130-133
R & D expenditures, % GDP	1,8	3,3	4,0
Education expenditures at the end of period, % GDP	5-5,2	5,3-5,7	5,5-6,0
Health services expenditures, at the end of period, % GDP	5-5,3	5,8-6	6,7-7

According to Long-term social and economic development of Russian Federation, M: Ministry for economic development of the Russian Federation, March, 2008. P. 24, 27-28, 30

only 63rd. Such a large variation between different aspects of innovative capabilities significantly reduces the overall efficiency. Russian patenting rate is smaller than in China and India (see Fig. 2).

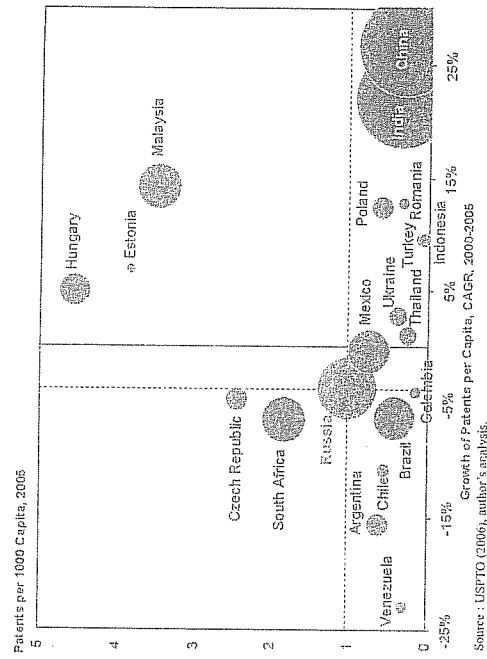


Fig. 2: U.S. Patenting Rates, Russia and Selected Peers, 2000-2005.

Source: PORTER M., KETELS K. (2007): Competitiveness at the Crossroads: Choosing the Future

Russian system of innovation is strong at its input and relatively weak at the output. Russia traditionally spends a noticeable share of GDP on research and development. However private business invests in science very little. Businessmen still enjoy the possibility of extensive growth, growth based on expanding the market more than its intensification. It is therefore not surprising that the majority of Russian inventions are patented in other countries, including the US, which use Russian scientific resources actively.

According to UNESCO, by number of employees engaged in research and development Russia takes 4th place after the United States, China and Japan. However, what is more important is not the number of researchers, but their effectiveness.

In recent years the Russian government has introduced several initiatives under its innovation policy. These include establishing special areas to promote science and technology. These measures will affect companies located within the territory of those members of the Russian Federation, where these special zones are situated.

The major problem of the Russian economy is its low performance level. Overcoming development gap in comparison with developed countries will become possible only with the help of innovations. This means that process of generating and using Schumpeterian-type innovations should become the key factor of economic development. It is necessary to note that innovative activity of businessmen can be present in various forms. Depending on existing game rules business activity can get not only productive (J. A. Schumpeter's creative destruction), but also unproductive (rent seeking) orientation.

3. Long-term forecasts of scientific and technological development of the Russian federation

3.1. Advantages and disadvantages of «The Concept of Long-term Socio-Economic Development of Russian Federation»

In March 2008 the Russian Ministry of Economic Development and Trade prepared «The concept of long-term socio-economic development of the Russian Federation», which established the program for long-term development of the country until 2020. It attempts to answer the challenges of the coming decade. These include the strengthening of global competition, a new wave of technological change and the increasing role of human capital as a real alternative to the exhaustion of sources of export and commodity development.

As history shows there is a compression of historical time. It does not mean, however, that all countries simultaneously will pass to a postindustrial society. Calculations show that it will occur far not to all countries. Rupture between the OECD countries and the countries of Tropical Africa even will increase (see Fig. 3).

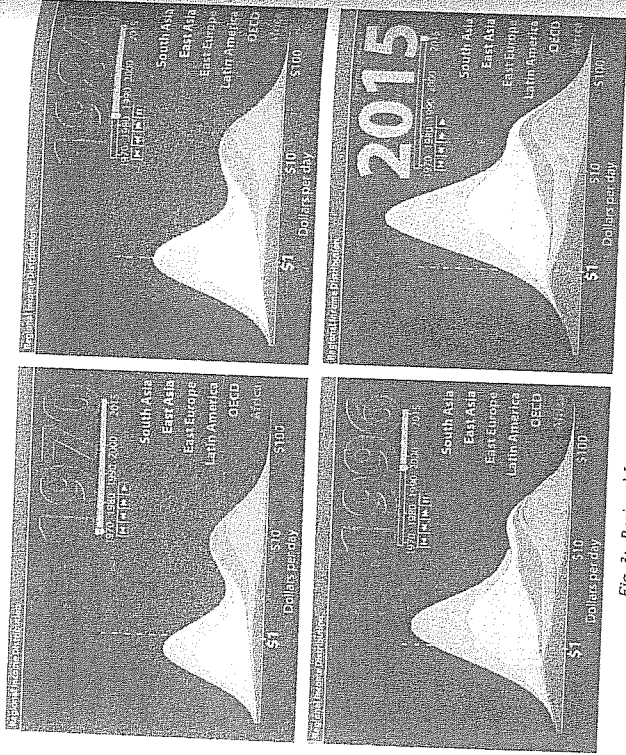


Fig. 3: Regional Income per capita Distribution (1970-2015)
<http://simun.info/ehlog>

These challenges are exacerbated by a growing number of unresolved social and institutional problems: high levels of social inequality and regional differentiation, the persistence of barriers to doing business, a weak interrelation of education, science and business, lack of competition in a number of markets and the low level of development of social capital. Under these conditions, as A. Gerschenkron wrote, the government becomes the leading factor of economic modernization, and it is its representatives that try to shape the concept of long-term socio-economic development of the country.

The strategic goal of this concept is to make Russia a leading country in the world in the 21st century. By 2020 according to the authors of the concept, Russia will be one of five top countries by GDP. Experts formally described three main development

All three variants do not assume fast growth of oil and gas production. However in case the innovative scenario will be implemented, slightly higher growth rates are assumed (see Figure 4).

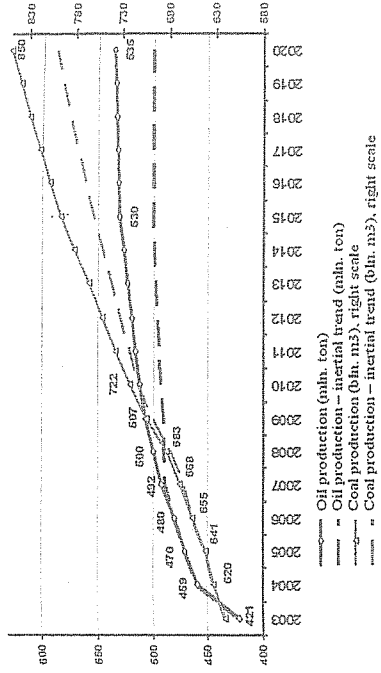


Fig. 4: Hydrocarbon production in long-term outlook

Source: Realisation of competitive advantages is the base of economic growth in long-term outlook, M. Center for Macroeconomic Analysis and short-term forecasting, 2007, slide 11

Targets set are very ambitious. In order to achieve these goals, it is necessary to:

- accelerate development of Russian human potential,
- create a highly competitive institutional environment that encourages entrepreneurial activity and attracts foreign investments,
- structurally diversify the economy through innovative technology development, strengthen and expand the global benefits of Russia in the traditional sectors (energy, transport, agriculture and processing of natural resources),
- increase the effective participation of Russia in the global division of labor and implement new spatial development model of the Russian economy.

Three periods of innovative development of economy are set: 1) from 2008 to 2012, 2) from 2013 to 2017, 3) from 2018 to 2020. The prognosis for development of macroeconomic indicators of Russia's economy in selected years is shown in Table 6.

It is expected that primary source of GDP growth will be a faster productivity growth and tremendous growth of investment. The last one significantly outscored the growth of productivity and GDP, which should lead to an increase in capital intensity of production and a fall of a yield on capital investment. It is assumed that R&D expenditures will reach

planned period will constitute 5.9-6% of GDP, while public health expenditures will increase from 3.7% in 2007 to 6.7-7% in 2020.

Analyzing the macroeconomic trends, the authors assume that rapid growth of imports, on the one hand, and lower prices of oil and metals, on the other hand, may lead to a negative balance of payments already by 2010. Despite the alleged export of engineering products, a negative trade balance will remain until the 2018-2020 years and reach 90-110 billion U.S. dollars (or 2% of GDP). The authors naively believe that the current account deficit will be offset by a sharp expansion of foreign capital inflows, which was at a level no lower than 3-3.5% of GDP (see Fig. 5). All these will provide a sharp decline in inflation to 3% per year by 2020.

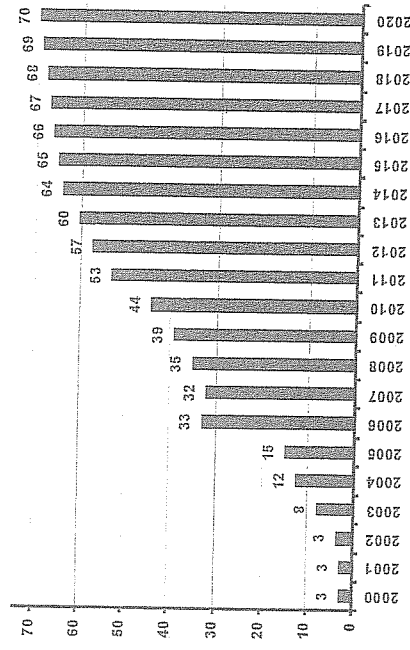


Fig. 5. Dynamic of direct foreign investments (billion \$)

Source: About economic growth potential in Russia, M. Center for Macroeconomic Analysis and short-term forecasting, 2007, slide - 9

It will allow to increase export of highly technology products from 0.7 bln. dollars in 2005-2008 to 4.3 bln. dollars in 2017-2020. However, if the intensive plan for development is not realized, level of export of highly technology products will be at 5-10 time less of planned level (see Fig. 6).

The development of the national innovation system will enhance the Russian position in the international arena and will contribute to the development of its comparative advantage in the competitive field of nuclear technologies, aircraft building, space-based services

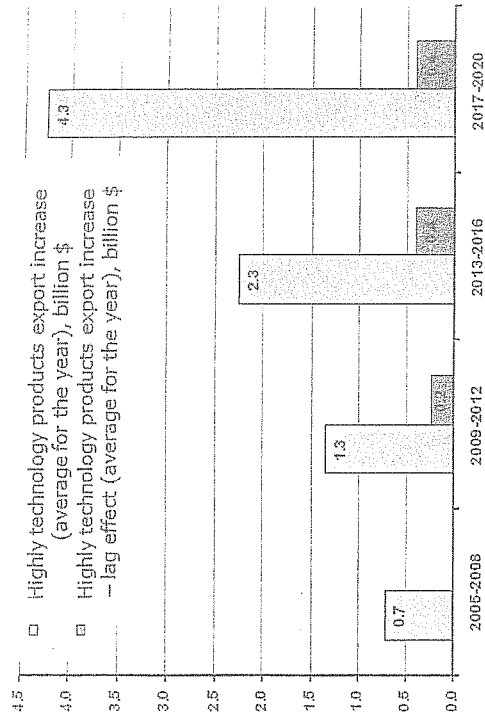


Fig. 6. Potential of Russian advanced technology products export (mlrd. \$)

Source: Realisation of competitive advantages is the base of economic growth in long-term outlook, M. Center for Macroeconomic Analysis and short-term forecasting, 2007, slide 17

Creation of such a strong plan for socio-economic development of Russia represents a significant step forward compared with 1990-s when everything was given at the mercy of unruly market forces. For the first time in the entire post-Soviet era government is trying to take the strategic initiative in its own hands. Certainly it is very good that the plan has a strong social dimension. In any case, public policy priorities are more or less clearly defined. The advantage is also that not only one but three scenarios are dealt with, and though the preference is given to an innovation-based one the difference between the three scenarios is not that big.

The point is that for all three scenarios a rise in efficiency of the economy is implied. The biggest difference between the three scenarios is a more rapid growth of investment under innovative scenario, which, as it has already been mentioned, will inevitably lead to a fall of a yield on capital investment. As GDP growth has lagged behind investment growth, the authors of the Concept focus on extensive accruing of the capital stock.

The emerging imbalance between exports and imports, from the authors of the Concept point of view will be offset by increasing foreign capital inflows, which also is highly

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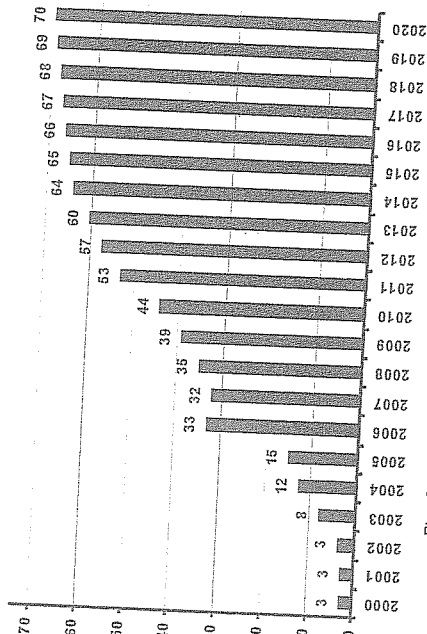


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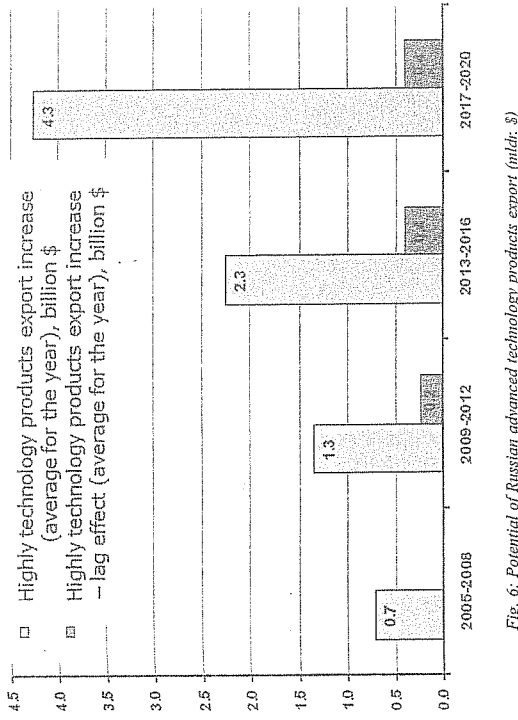


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of the Concept suggest that the increase in expenditure on R & D will yield a return only at the end of the planned period. This also indicates reliance on extensive growth.

However, the main drawback is a mechanism to ensure this growth. Setting goals and identification of specific parameters of development is an important but insufficient condition for economic development. Institutional problem of ensuring that growth doesn't withstand even the most sympathetic touch of criticism. Although, from time to time, calls for greater investment by the private sector are issued, but a mechanism to stimulate development in this area is not developed. It should be remembered that the role of the state (which is the main driver of technological progress, according to the Concept) as a result of the privatization process is extremely modest. Meanwhile, a sharp increase in spending on social services will raise a question of supplying the budget with necessary funds. This can be achieved either by raising taxes, or by expanding the public sector. However, neither way, fortunately, is not anticipated.

3.2. RAND Corporation forecast (USA)

Scientists of RAND Corporation (USA) published in 2006 a study on the global technological revolution of 2020, on the material in 29 countries and 16 technologies. They divided all countries into 4 groups, marking their respective colors on the map: the most advanced countries are marked in blue, following them - green, developing science -

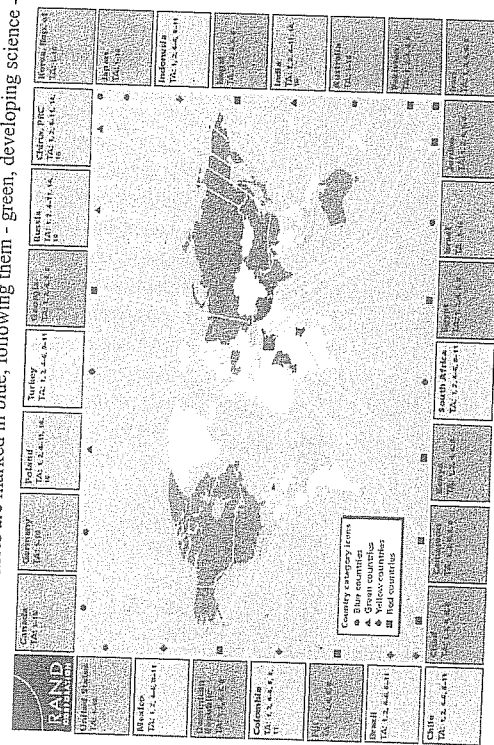


Fig. 7: Potential of separate countries on making 16 technologies

Typical technologies (TT) market the numbers:

1. **Cheap solar energy:** Solar energy systems inexpensive enough to be widely available to developing and undeveloped countries, as well as economically disadvantaged populations.
2. **Rural wireless communications:** Widely available telephone and Internet connectivity without a wired network infrastructure.
3. **Communication devices for ubiquitous information access:** Communication and storage devices—both wired and wireless—that provide agile access to information sources anywhere, anytime. Operating seamlessly across communication and data storage protocols, these devices will have growing capabilities to store not only text but also meta-text with layered contextual information, images, voice, music, video, and movies.
4. **Genetically modified (GM) crops:** Genetically engineered foods with improved nutritional value (e.g., through added vitamins and micronutrients), increased production (e.g., by tailoring crops to local conditions), and reduced pesticide use (e.g., by increasing resistance to pests).
5. **Rapid bioassays:** Tests that can be performed quickly, and sometimes simultaneously, to verify the presence or absence of specific biological substances.
6. **Filters and catalysts:** Techniques and devices to effectively and reliably filter, purify, and decontaminate water locally using unskilled labor.
7. **Targeted drug delivery:** Drug therapies that preferentially attack specific tumors or pathogens without harming healthy tissues and cells.
8. **Cheap autonomous housing:** Self-sufficient and affordable housing that provides shelter adaptable to local conditions, as well as energy for heating, cooling, and cooking.
9. **Green manufacturing:** Redesigned manufacturing processes that either eliminate or greatly reduce waste streams and the need to use toxic materials.
10. **Ubiquitous radio frequency identification (RFID) tagging of commercial products and individuals:** Widespread use of RFID tags to track retail products from manufacture through sale and beyond, as well as individuals and their movements.
11. **Hybrid vehicles:** Automobiles available to the mass market with power systems that combine internal combustion and other power sources while recovering energy during braking.
12. **Pervasive sensors:** Presence of sensors in most public areas and networks of sensor data to accomplish real-time surveillance.
13. **Tissue engineering:** The design and engineering of living tissue for implantation and replacement.
14. **Improved diagnostic and surgical methods:** Technologies that improve the precision of diagnoses and greatly increase the accuracy and efficacy of surgical procedures while reducing invasiveness and recovery time.
15. **Wearable computers:** Computational devices embedded in clothing or in other wearable items, such as handbags, purses, or jewelry.

NOTE: Countries were selected as representative of groups of similar nations in a geographical area. Countries are color coded by their S&T capacity: scientifically advanced (blue), scientifically proficient (green), scientifically developing (yellow), and scientifically lagging (red). Technology application (TA) numbers are as follows: (1) cheap solar energy, (2) rural wireless communications, (3) ubiquitous information access, (4) GM crops, (5) rapid bioassays, (6) filters and catalysts, (7) targeted drug delivery, (8) cheap autonomous housing, (9) green manufacturing, (10) ubiquitous RFID tagging, (11) hybrid vehicles, (12) pervasive sensors, (13) tissue engineering, (14) improved diagnostic and surgical methods, (15) wearable computers, (16) quantum cryptography.

RAND Corporation provides an assessment of the capacity of individual countries on the introduction of advanced technologies (See Fig. 8). The blue quadrant indicates a

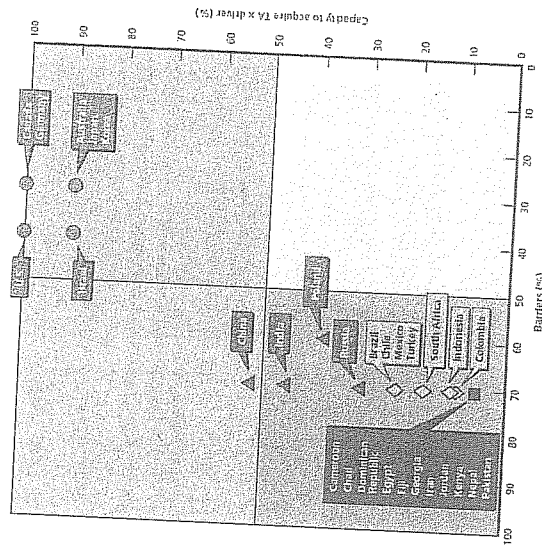


Fig. 8. Potential of separate countries on introduction 16 technologies
 Source : The Global Technology Revolution 2020: Trends, Drivers, Barriers and Social Implications,
 RAND Corporation, TR-303-MC, 2006

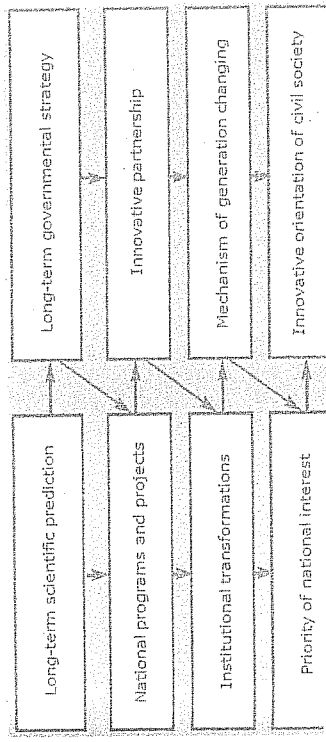
points and many more obstacles to development than in the first two cases. Red quadrant indicates a lack of high-level science and technology development, with much greater obstacles than the growth points.

Canada, Germany and the United States dominate, with a large gap. They are characterized by the lowest barriers to scientific progress (in the U.S., though there are more obstacles than the first two countries). It is followed by Australia, Japan, Korea and Israel. The potential for the development of science and technology in China, India, Poland and Russia is much more modest. In these countries a lot more obstacles to development are present, which will certainly be a factor undoubtedly limiting a high scientific and technological potential of these countries. Brazil, Chile, Mexico, Turkey, South Africa, Indonesia and Colombia follow behind them. With respect to the chosen 11 developing countries, the possibilities of development are evaluated as very modest (see Fig. 8).

3.3. Forecast of Russian Institute of Economic Strategies

In 2006, the Institute for Economic Strategies (Russia) published a report «Forecast of innovation, technological and structural dynamics of the economy of Russia until 2030, taking into account global trends». This report attempts to identify trends in the development of the national economy over the next 25 years.

The authors analyze two main scenarios for the development of national economy: inertial and innovative - breakthrough. Given the risk of depopulation in Russia, exhaustion of the best mineral deposits and growing economic dependency on exports of fuels and raw materials, the report's authors believe innovative - breakthrough scenario is the only alternative that meets the challenges of the XXI century. They suggest the following conditions for the implementation of innovative-breakthrough scenario (see Fig. 9).



The authors mention six conditions

- 1) The revival of long-term scientific predictions.
 - 2) Forward-looking public policies.
 - 3) Establishment of innovative partnerships between government, business, science and education.
 - 4) Implementation of institutional transformation, enabling a breakthrough innovation.
 - 5) Provision of opportunities for the law of change of generations.
 - 6) Ensure the priorities of national interests in the development and implementation of long-term development strategy for Russia and the ongoing business³.
- Innovative-breakthrough scenario recognizes that on the basis of long-term scientific forecasting the state strategy is developed. It includes government programs and projects. For their realization it is necessary to carry out a complex of institutional transformations with the account of a priority of national interests (see Fig. 10).

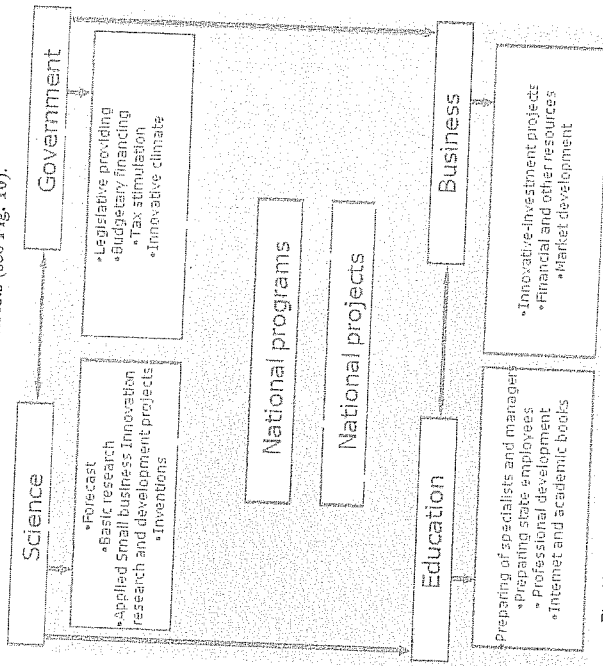


Fig. 10: Innovative partnership of government, business, science and education until 2030 year subject to global tendency. M.: Institute of economic Strategia, 2006, P. 45

Such strategy assumes innovative cooperation of science and education. Together with the state and business they create national programs and projects. Such cooperation creates preconditions for innovative orientation of all civil society and is pledge of successful realization of innovative-breakthrough scenario.

Innovative partnership already announced during realization of national programs. Largest of them are:

1. Investment in transport infrastructure, provided the transport strategy of Russia (2006-2020);
2. The state program of armaments for 2007-2015. - Program development and procurement of equipment for Russia's Army;
3. The stated program of building 40 new nuclear power units;
4. Program development of gas fields of Yamal Peninsula;
5. Capital investments in the program of development of gas fields in Eastern Siberia and the Far East (intensive version);
6. Capital investments in the development program of main electric networks in Russia at 220 kV and above in the period up to 2013 (see Table 7).

Table 7—Public investment program to modernize certain sectors of the economy

Programs	Funding Requirements
Investment in transport infrastructure, provided the transport strategy of Russia (2006-2020)	The annual volume of financing - \$ 20 billion
The state program of armaments for 2007-2015. - Program development and procurement of equipment for Russia's Army	Total funding - 4.94 trillion. rub., or 20.5 billion dollars per year
The stated program of building 40 new nuclear power units	Total \$ 56 billion
Program development of gas fields of Yamal Peninsula	Total \$ 70 billion
Capital investments in the program of development of gas fields in Eastern Siberia and the Far East (intensive version) different scenarios)	Total 40-56 billion dollars (based on different scenarios)
Capital investments in the development program of main electric networks in Russia at 220 kV and above in the period up to 2013	Total 12.6 billion

Source: Milov V. Could Russia become an energy superpower? // *Questions of Economy*. 2006. 10, p. 23 in Russian

The most vulnerable place of the projection of Institute of economic policies is that the authors do not describe the mechanism of its implementation. They believe that it is necessary «to refocus on innovation and breakthrough way, as private capital, and public authorities at all levels», but, unfortunately, are not as practical to do, how to create the institutional preconditions for the realization of their grand plan.

Therefore, let's try to formulate the tactical priorities for the coming years. Scientists

formulate specific actions that would indicate a general vector of the changes, allow a rapid positive effect and find support from a wide range of fellow citizens.

Financial resources from selling the fuel and raw materials, could be used for the development of advanced technologies. The authors' of «... Russia's economy forecast to 2030» believe that under the inertial scenario public sector share should decrease from 31% in 2004 to 19% in 2030, while the share of big and medium business should increase from 41% in 2004 to 49% in 2030, and the presence of foreign capital should double (from 8 to 16%, respectively, see Figure 11).

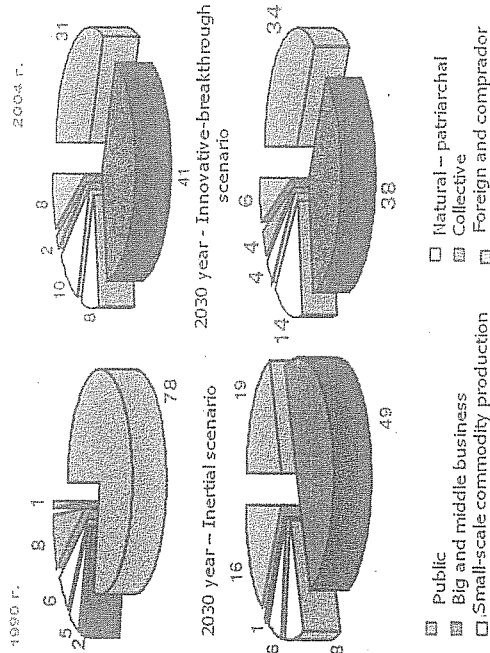


Fig. 11: Forecast of Russian economy sectors dynamics (%)

Source: Prediction of innovative – technological and structural dynamic of Russian economy on the period until 2030 year subject to global tendency. *M.: Institute of economic Strategies 2006, P. 35*

The implementation of innovative-breakthrough scenario will lead to an increase of the share of the public sector by 2030 to 34%, big and medium business share should decrease to 38%, the share of foreign capital should decrease to 6%, and small-scale product should grow from 8% to 14%. This means that the leading role in implementing innovative scenario the authors give to the state. It, from their point of view, must assume the bulk costs, both in production as well as in the social sphere, to act as a strategic investor in key sectors of the economy.

Authors of Strategy of Russian Economic Strategy Institute pay attention to technological side of questions. They analysed the big Kondratyev's cycles during the

XX-XIX centuries (see Fig. 12). They give special attention to the period from 1990 for 2030. During this period there is a change of the IV, V and VI technological ways

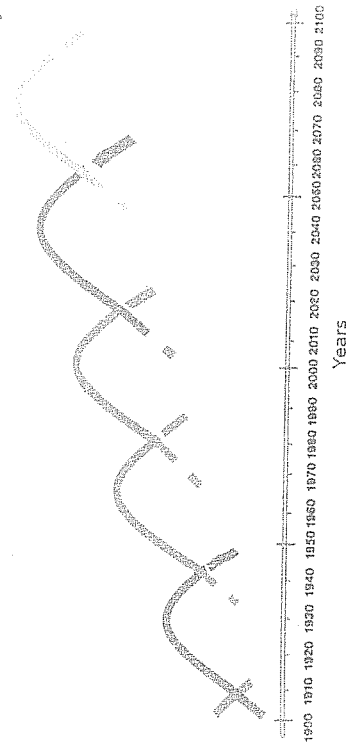


Fig. 12: Rate of technological ways and equipment changing in vanguard countries

Source: Prediction of innovative – technological and structural dynamic of Russian economy on the period until 2030 year subject to global tendency. *M.: Institute of economic Strategies 2006, P. 24*

(see Fig. 13). In 1990 in Russia the III and IV ways dominated. On them 37 % and 31 % (correspondingly) of cumulative GNP were necessary. In 2000 because of economic

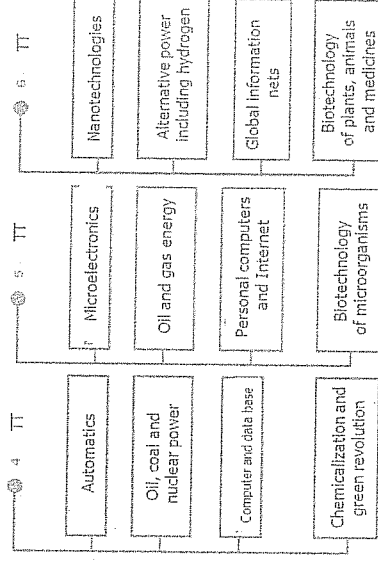


Fig. 13: Basic directions of Technological Tenor

Source: Prediction of innovative – technological and structural dynamic of Russian economy on the period until 2030 year subject to global tendency. *M.: Institute of economic Strategies 2006, P. 24*

recession their share remained almost invariable (35 % and 54 % correspondingly). Nevertheless in 2010 the share of the IV way has risen to 60 %, and V way has considerably pressed the III way, which share increased from about 4 % in 2000 to 17 % in 2010. If the planned forecast is realized the V way will increase up to 40 % to 2030 year and it becomes a leading way (see Fig. 14).

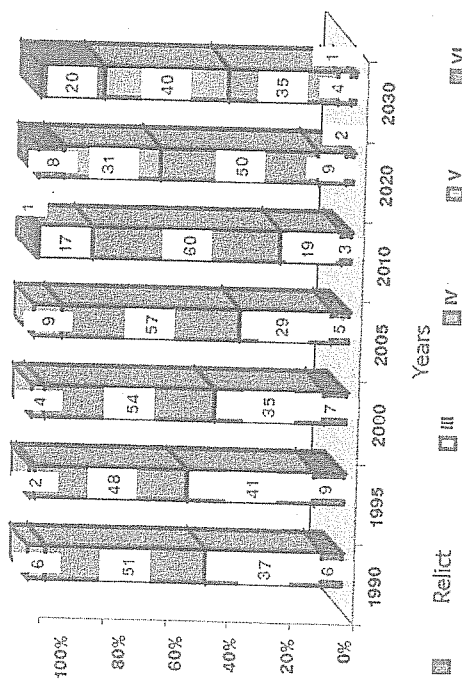


Fig. 14. Forecast of Russian economy institutional structure dynamic (innovative-reakthrough scenario, technological tenor, share in total output in producer's price, %).
Source: Prediction of innovative - technological and structural dynamic of Russian economy on the period until 2030 year subject to global tendency. *M. Institute of economic Strategies, 2006, P. 29*

3.4. Institute for Strategy and Competitiveness (Harvard Business School) Forecast
However, not all scientists look at an increase of government's influence with optimism. Michael Porter and Christian Ketels also understand that the strengthening of the state is inevitable. But they give it a different role. U.S. scientists believe that the primary role of government is to strengthen macro-economic, political, legal and social components of the institutional environment. From the point of author's view, it is necessary to:

- 1. Create an efficient and independent legal system. Creating sound procedures to enforce the law and protect individual rights is necessary for increasing the credibility and impact of government policies. Crucially, the government needs to resist the temptation to interfere with the judiciary, even when decisions

should work with international organizations and agreements, such as the WTO, to ensure credibility of adherence to policies.

- *Improve the capabilities and professionalism of political institutions.* Stronger government institutions, with a system of checks and balances, are the only effective way to achieve political stability. Political reform in this direction will be complicated but necessary. Ensuring orderly transfers of power, and continuity in policy direction, are especially crucial.
- *Use competitive principles to improve the delivery of public and social services.* Improving public and social services is needed to increase productivity and will be essential to engaging the support of the majority of Russians for further economic reforms. One priority is to reform the health care system using value-based competition principles. Among other steps, health care provision could be opened up to both public and private providers to drive a step-change improvement in health care delivery and open up a huge new market for entrepreneurship».

It means that administrative transparency, professionalism, and efficiency should be improved. "With a more reliable and efficient administration, corruption will decline, the costs of doing business will fall, uncertainties and delays that hinder investment decisions will be reduced, and competition will rise. There is an urgent need in Russia to reduce, simplify, and streamline rules and regulations at all levels of government. Past incremental approaches to administrative reform have not succeeded".

They offer a whole system of measures to increase competition in the economy, with a view to streamlining and limiting the role of government in the economic sphere. In their view, it is necessary to intensify the process of international trade and investment of foreign capital, as well as to encourage competition between regions. Economic ties with the neighboring countries, the report considered unproductive. Russia could benefit by establishing mutually beneficial economic relations with all neighboring countries.

According to the authors Russian economic policy should be developed under three broad themes: "First, Russia needs an overall national economic strategy for the economic direction it wants to take. Second, Russia must upgrade the foundations of competitiveness through concerted efforts in strengthening context, improving the general business environment, supporting cluster development, creating competitive regions, and developing productive economic linkages with neighboring countries. Third, Russia needs to define a growth path which is based on its strengths and which will diversify the economy from its extreme natural resource dependence".

M. Porter's and C. Ketels's report «Competitiveness at the Crossroads: direction of the Russian Economy» shows percentage change in the Russian Federation in 1997 - 2005 cities; most attention they have given to the development of clusters. According to the authors, «Clusters are a natural manifestation of the role of specialized knowledge, skills, infrastructure, and supporting industries at a particular location in enhancing productivity, innovation, and new business formation».

4 Porter M., Ketels K., 2007. p. 82-83
5 Ibid P.84

Figure 15 shows that the share of the oil and gas industry significantly increased, as well as the extraction of metals and primary metal products. At the same time, these clusters

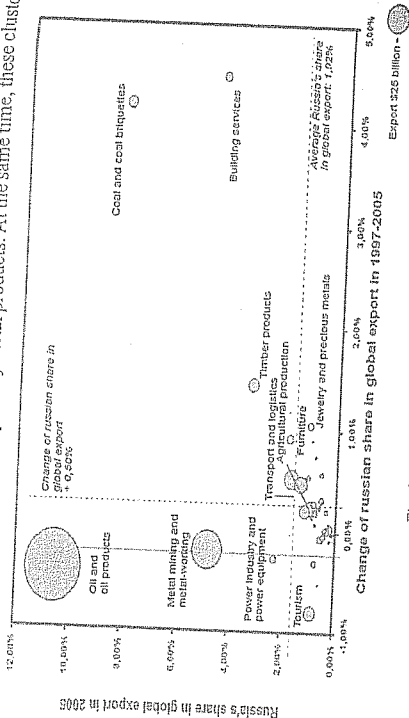


Figure 15: Export clusters of Russia: 1997-2005
 Source: Porter M. International project of competitiveness clusters creation. Strategy and Competitiveness Institute. Harvard University. Richard Braden, project director. Data: UN Commodity Trade Statistics Database and the IMF-SCP statistics. 2005

dominate today's Russia (see Figure 16), hampering the harmonious development of other economic sectors. To follow the authors' advice, Russia has to continue to focus on oil

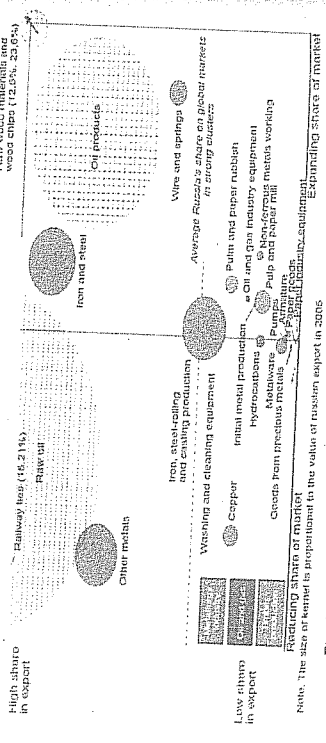


Figure 16: Average Russian share on global markets for various clusters
 Source: Porter M. International project of competitiveness clusters creation. Strategy and Competitiveness Institute. Harvard University. Richard Braden, project director. Data: UN Commodity Trade Statistics Database and the IMF-SCP statistics. 2005

and gas production and primary processing (plastics and chemical products), forestry (decorative materials, construction equipment, construction, woodworking and furniture production), as well as industrial equipment, necessary for their production (see Figure 17). The last area of potential growth is the metallurgical industry. Only it produces what might be called a «new economy» (motors for space vehicles, automobiles, and certain types of industrial equipment).

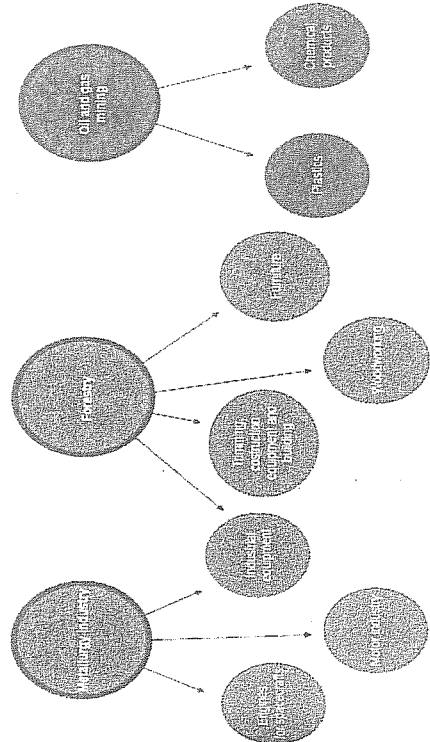


Figure 17: Growth possibilities in connected clusters in Russia (according to M. Porter)
 Source: PORTER M. KETELS K. (2007): Competitiveness at the Crossroads: Choosing the Future Direction of the Russian Economy. Moscow: p.98

M. Porter and C. Ketels believe that in the nearest future, Russia will retain its resource specialization and hardly has a chance for harmonious development of various clusters, typical of developed countries.

Their pessimism is based on the situation doing business in Russia for the last several years. It has not improved during last four years. If in 2008 Russia occupied 112 rank in 2011 it has moved on to 123 rank (see Table 8). It testifies about high transaction costs. Without their reduction fast moving to an innovative way of development is

Table 8—Doing business in Russia (2009-2011)

Ease of...	2008 rank	2009 rank	2010 rank	2011 rank
1. Starting a Business;	52	65	104	108
2. Dealing with Construction Permits;	180	180	182	182
3. Employing Workers;	100	101	N/A	N/A
4. Registering Property;	46	49	45	51
5. Getting Credit;	102	109	87	89
6. Protecting Investors;	84	88	92	93
7. Paying Taxes;	136	134	103	105
8. Trading Across Borders;	162	161	162	162
9. Enforcing Contracts;	18	18	18	18
10. Closing a Business;	83	89	93	103
Doing Business	112	120	116	123

Source: Doing Business in Russia - 2011. The World Bank Group. <http://www.doingbusiness.org/>

4. Strategy and tactics of Russia's modernization in the light of the concept of social market economy

According to the analysis above there are some recommendations which can be offered. But we should take into account the mistakes which were done in the past. Economic policy should not be formulated with an emphasis on "restoration" and "survival". It shouldn't build on the opposition of market and democracy, on the one hand, and social justice, on the other hand. There is a wrong way to build the economy on the opposition of government and the market. Economic policy shouldn't focus on any one social group: the poor people, entrepreneurs, Russians and so on. On the other side, it shouldn't be based only on quantity indicators ("Double the pace of economic growth", "To catch up and overtake America in performance" etc.). Nostalgia for the Soviet Union of the past should go out.

We propose that the model of social market economy can be used for Russia in the 21st century. Basic elements of social market economy are personal liberty, social justice and economic efficiency.

Personal liberty assumes trust strengthening between agents, development of guarantees of private property, and regular economic policy promoting freedom.

- building trust between subjects
- development of guarantees of private property
- systematic economic policies that promote freedom

With social justice present market economy promotes social development and

strengthens middle class. Democracy will be allowed to break administrative barriers and to create middle class.

"Offshore aristocracy", which moved its capital to foreign countries.
The bureaucracy, which gradually turns from the Soviet nomenclatura to the competent state. Employees.

In the formation of the national elite, an important role to play in the modern system of education and culture.
Stratification of Russian higher education reinforces and reproduces the differentiation of post-Soviet society.

Even in the Soviet Union there was more opportunity for representatives of regional centers to break into the top of the pyramid.

- Send a market economy at the service of social.
- Poor can be allowed, to live in dignity, we must act together.
- Basis of Russia - the middle class.
- To break administrative barriers, create public control.
- Encourage regional engines of growth.
- Provide targeted support to vulnerable regions and ensuring them conditions to improve the quality of life as one of the criteria for the integrity of Russia.

Economic efficiency should be directed towards creation and maintenance of competitive order, strengthening of antimonopoly activity and improving fair entrepreneur's image. This will make Russia more attractive for workers from abroad and help it develop integrative relations with neighboring countries ("economic recovery of a single post-Soviet space").

The following requirements for effective economic policy can be offered to reach the market economy. It should be understandable for citizens. Politicians must convince the people of its (politics) total accuracy. Policy must be consistent, open and honest. It should be tactically constructed in the nearest future: directed not only to a long-run final result, but also convincing demonstrational effect within reasonable time spread according to expectation of population.

All these measures will raise economic efficiency while creating preconditions for fast overcoming of the crisis and increasing the welfare and the acceleration of economic development of Russia.

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Lessons from the Age of Post-War Economic Miracle in Japan

Tateo Fujimoto

Faculty of Economics, Konan University, Kobe, Japan

Why has Japan developed economically so rapid after the world war II in spite of a very poor country in natural resources? And now why is Japanese economy suffering from the long-term economic slump? These issues are not only very critical for the Japanese economy, but also might give various suggestions for the countries of now booming economies.

The post-war economic miracle started from 1955 and ended at 1991 in Japan. This period is divided into three terms, from 1955 to 1973, from 1973 to 1985 and from 1985 to 1991. And after 1991 Japan is in distress with the slump.

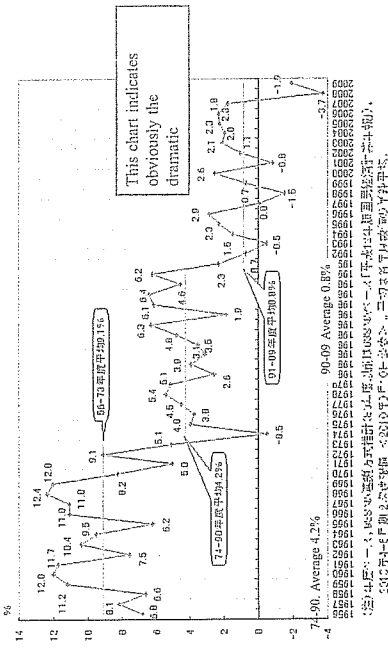


Fig. 1: Change of GDP