

## THE INFLUENCE OF TECHNOLOGICAL ADVANTAGES ON THE ECONOMIC DEVELOPMENT OF KAZAKHSTAN

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This research analyses the influence of technological advantages on the economic development of Kazakhstan. Here authors touch upon the issue of technical and technological backwardness of Kazakhstan enterprises, the absence of effective connection between science and manufacture, low costs on research and experimentally-engineering works, discrepancy of management to the tasks of adaptation of economy to the processes of globalization and conversion to the service-technological economy.

In the research there were used the showings of innovative activeness of Kazakhstan enterprises from 2003 till 2008 years, the structures of innovative production of the Kazakhstan republic, the number of created and used new technologies and objects of technique in Kazakhstan, the costs on the technological innovations of enterprises by the sources of financing, there was carried out the descriptive analysis of facts. The discussion was aimed at the revealing of reasons of low innovative receptivity of Kazakhstan economy.

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Keywords: the rise of producing, technological changes, innovations

The processes of globalization raise the number of problems to the Kazakhstan economy, the main sense of which boils down to the necessity of raising the competitiveness not only of enterprises but also of their producing production. Meanwhile technological changes, which were caused by the use of new scientific achievements, change the contours of traditional sector, promote more rapid forming of new technologies at the sphere of computerization, biotechnology, energetic, communication and space researcher, where employment increases rather dynamically, than at other spheres of traditional economic activity.

Thus, in the most developed technically country in the world USA, the average annual growth of producing high technological goods (HTG) during the period from 1998 till 2008 year formed at the sphere of computer and office equipment producing 14,5%, producing of electronic components 10,9%, computer treatment of the facts 10,3% and producing of communicative equipment 8,1% (table 1).

With regard to Kazakhstan specific, where are successfully realized structural in-

stitutional reforms, there are observed more rapid temps of growth of the export potential of the country and there is no adequate growth of the sectors of manufacturing industry. Materially economy of Kazakhstan concerns energy and labor-consuming, badly adapted to the realities of outer competitiveness. By the level of costs of electric energy on 1 dollar of Gross Domestic Product (GDP), and also by the productivity of labor at the sectors of economy Kazakhstan falls behind some industrially developed countries more than 7–10 times. The basic funds of Kazakhstan enterprises fall into decay.

To the beginning of 2009 year the degree of wear of basic means was at the average 50–60%. At the number of sectors the physical wear of basic means was near to 70% and more. For the comparison, to the producing of 1 dollar of GDP in Great Britain, Germany, Italy and Japan, there are expended 0,22–0,3 kilowatt-hour, in the USA, France, Turkey, Korea – 0,4–0,6, in Canada and China – 0,8–1,2 kilowatt-hour, whereas in Kazakhstan these costs are 2,8 kilowatt-hour. In the country there

is observed the sectoral imbalance of the costs of labor on the producing of the unit of realized production, what also promotes

the warp in the income of population by the sectors, creates the tensivity by all levels of budget of the country [1].

**Table 1**

The dynamics of producing and growth of employment at separated spheres of high technological goods in the USA in 1988–2008 years

| Spheres of producing                        | Producing of high technological goods, millions of dollars |            |             | The average showing of grows, % |                 |
|---|--|------------|-------------|---------------------------------|-----------------|
|   | 1988 year*   | 1998 year* | 2008 year** | 1988–1998 years                 | 1998–2008 years |
| Computer treatment of the facts             | 77   | 219        | 584         | 11,1                            | 10,3            |
| Producing of electronic components          | 55   | 203        | 571         | 13,9                            | 10,9            |
| Producing of communicative equipment        | 38   | 78         | 169         | 7,6                             | 8,1             |
| Producing of computers and office equipment | 50   | 446        | 1723        | 24,6                            | 14,5            |

Sources:

\* World Employment Report 2001: Life at Work in the Information Economy. ILO. – Geneva, 2001. – P. 119.

\*\* Kasimov S.M. New technological order: tendencies of employment and education // Transit economy. – 2009. – №3. – P. 45.

The general technical and technological backwardness of enterprises, the absence of effective connection between science and manufacture, low costs on the research and experimentally-engineering works, discrepancy of management to the tasks of adaptation of economy to the processes of globalization and conversion to the service-technological economy, this is not full list of problems, which hold back further forward development of national economy. The low part at the export of production that was made with the use of average and high technologies, prevent Kazakhstan to occupy the deserv-

ing place in the world division of labor. In the structure of Kazakhstan export there prevail raw materials and metals, and are practically absent finished goods. The degree of diversification of export there is suggested by the following fact. The developed countries export 179–181 types of goods, Argentina – 148, Saudi Arabia – 128, when Kazakhstan – only 21. If the index of trade structure of export in the developed countries is 0,24–0,37, then in Kazakhstan – 0,87. While the continuation of such scenario of development Kazakhstan would be able to turn into rough adjunct of developed states [2].

Countries, which can't provide the necessary level of the population's education, of the science and technology development, of the quality of informative sphere, will be doomed to the deeping into dependence on outward financial and informative centers and will reserve the functions of the source of natural raw materials and human material for the TNK from the developed countries, which concentrate the global intellectual potential [3]. It's known that while the processing of the oil by the energetic scheme the summary cost of received oil products exceeds the cost of feedstock only 4 times, and by the petrochemical scheme – 40 times. The potential value of hydrocarbon resources while producing of final synthetic fibers exceeds the cost of raw oil practically 100 times. The rough value of exported tungsten concentrate is 600 dollars of USA per ton, metallic tungsten 6 thousands, wire 60 thousands of dollars per ton and tungsten tape – more than 100 thousands of dollars per ton.

At the base of innovative assessment of the production capacity, which includes the commercial use of knowledge and ability to produce and realize competitive production, there is based the classification of technological capacity of trade (TCT) that was developed by the United Economical Union of Development (UEUD).

The technological capacity of trade (TCT) is the part of costs on researches, development and use at the volume of producing and trade of goods of separate sectors and presents the degree of relative innovation of good. Accordingly to the goods specialization by the level of technological capacity (UTET) (the level of relative innovation) of goods by the classification OESR, Kazakhstan Republic belongs to the countries which produce mainly middle and low technological traditional goods, and by the level of economical develop-

ment is at the level of before industrial and industrial stages at the development in the group of developing countries with overtaking development (table 2).

By the facts of specialists, at the market of high technological goods, by the cost 1 kg of optical, radio-electronic and gyroscopic elements is virtual to the 110 tons of oil and practically 2 times more expensive than 1 kilogram of gold. By the average facts depending on the type of used space apparatuses the launching into the space of 1 kilogram of commercial goods is at the limits from 20,0 till 40,0 thousands of dollars of USA. 1\$, which was deposited into electronics, brings 100\$ at the final product [3].

Thereby, the forming of technological advantages of the state is impossible without creation and introducing of innovations. In the Kazakhstan today there is observed the decrease of activity of enterprises at the sphere of creation and spreading of innovations. By the assessments of the Agency RK statistic says, that 01.01.2009 year the specific weight of innovatively active enterprises in the republic was 4,0 % from the general number of respondents (11172 units). Previous years it has following level: 2007 year – 4,8 %, 2006 year – 4,8 %, 2005 year – 3,4 %, 2004 year – 2,3 %, 2003 year – 2,1 % [4]. For the comparison the specific weight of innovatively active enterprises in Russia is 13 % (2008 year) [5], in the countries of East Europe – till 40 % (Rumania – 28 %, Slovenia – 32 %, Poland – 38 %), in the countries of OESR – near 50 % [6].

In the regional section in the innovative development there are leaders: Karagadinsk region (innovative activity 6,5 %), Almaty city – 6,4 %, Jambylsk region – 6,0 %. Among the falling behind there are unexpectedly singled out: Astana city – 1,8 %, Almaty region – 1,9 %, Mangistausk region – 1,9 %.

**Table 2**

The level of technological capacity (UTET) (the level of relative innovation) of goods by the classification OESR, in %

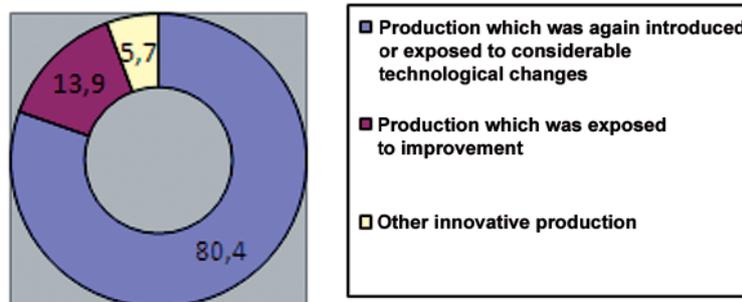
| Name of goods                     | Technological capacity of goods, in % (TCT) | The level of technological capacity (UTET) (the level of relative innovation) of goods | Goods specialization of the Kazakhstan Republic |
|-----------------------------------|---|--|---|
| Aerospace equipment               | 22,7  | High technological goods<br>TCT = 11,4%  |   |
| Office equipment and computers    | 17,5  |  |   |
| Electronics and its components    | 10,4  |  |   |
| Medicines                         | 8,7   |  | Medicines                                       |
| Devices                           | 4,8   |  | Devices   |
| Electrical equipment              | 4,4   |  | Electrical equipment                            |
| Automobiles                       | 2,7   | Middle technological goods<br>TCT = 1,7%   |   |
| Chemicals                         | 2,3   |  | Chemicals                                       |
| Other industrial goods            | 1,8   |  | Other industrial goods                          |
| Non-electrical equipment          | 1,6   |  | Non-electrical equipment                        |
| Rubber, plastic                   | 1,2   |  | Rubber, plastic                                 |
| Nonferrous materials              | 1,0   |  | Nonferrous materials                            |
| Brick, clay, glass                | 0,9   | Low technological goods<br>TCT = 0,5%  | Brick, clay, glass                              |
| Food, tobacco                     | 0,8   |  | Food, tobacco                                   |
| Vessels, oil, ferrous materials   | 0,6   |  | Vessels, oil, ferrous materials                 |
| Products from metal               | 0,4   |  | Products from metal                             |
| Paper, wallpaper, tree, furniture | 0,3   |  | Paper, wallpaper, tree, furniture               |
| Fabrics, clothes, shoes           | 0,2   |  | Fabrics, clothes, shoes                         |

Source: [3]

While this, the general picture of innovative processes in the country on 01.01.2009 year was defined practically by one sector – metallurgy (84,4% of all manufacturing innovative production of RK). The second position is occupied by building – 9,6%. At the third level is chemical industry – 3,8% and mining industry – 2,1%. Among the outsiders there turned out agriculture (produced innovative production to the 284,1 million of tenge or 0,1%) [4].

In addition, nowadays one can notice, that Kazakhstan enterprises at the

sphere of innovative activity have generally chosen «overtaking» strategy, what testify to their innovative unreceptiveness. «Overtaking» strategy means the imitation of foreign technologies, copying of products and their mass producing [7]. Thus, from all realized in the Kazakhstan innovative production on 01.01.2009 year at the sum of 111531,1 million of tenge, production, which was again introduced or which went through the considerable technological changes, was 80,4%, while this the part of really on principle new production is still unknown (Fig. 1).



**Fig. 1.** Structure of innovative production PK for 01.01.2009 y.

In comparison with previous years, the part of production which was again introduced or which went through the considerable technological changes, changed in following way: 2003 year – 14,7%, 2004 year – 28,6%, 2005 year – 36,7%, 2006 year – 56,7%, 2007 year – 70,6%. That shows the undeniable tendency of growth [4].

The low ability of enterprises of carrying out of innovative activity is defined by low level of receptivity of economy of republic to the innovations. Nowadays the demand is not oriented at the use of advanced manufacturing sciences, which are character for the modern level of scientifically-technological progress. By the facts of Agency RK the statistic says that during 2008 year, from the 578 created new tech-

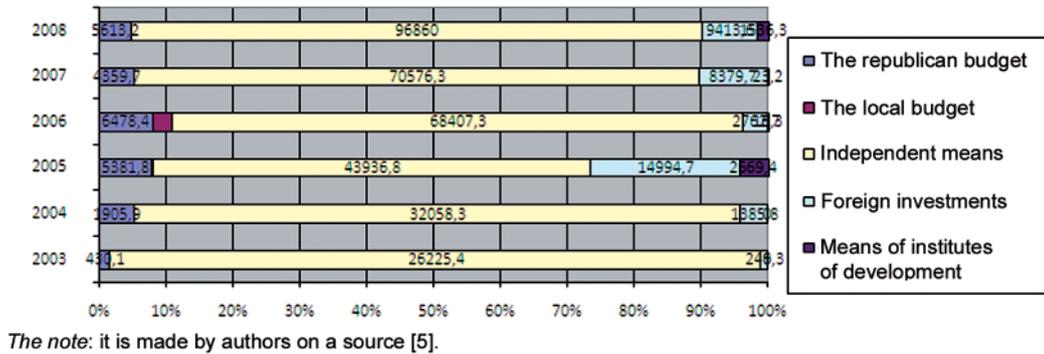
nologies and objects of technique only 245 of them were used in practice [4]. While this the capital deposits of enterprises, including deposits into the innovative activity, enterprises have to do generally by the expense of their own means, the inflow of investment money from without is still not considerable (Fig. 2).

The ways of solving of this problem by other countries are well known. This is, for example, the creation of Research Institute by joint efforts, HEIs and industrial companies of new innovative enterprises, or «start-up» of companies, which are oriented to the commercializing of the results of scientific researches.

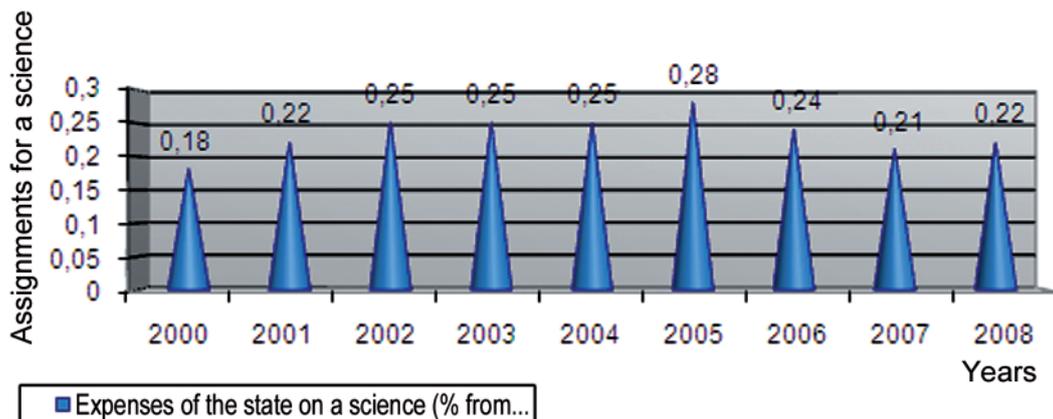
Other rather serious reason of low innovative receptivity, and consequently

the absence of technological advantages of domestic economy is the problem of financing of science in common in Kazakh-

stan, and fundamental, particularly. In RK the level of state financing of science has unstable dynamics (Fig. 3).



**Fig. 2.** Expenses for technological innovations of the enterprises for financing sources in 2003-2008 yy.



**Fig. 3.** Expenses on a science in 2000-2008 yy. in Kazakhstan (in % to GNP)

In comparison with the developed countries this showing has rather low level (USA – 2,9% from GDP, Japan – 3,0%, Germany – 2,35%, France – 2,25%, Sweden – 4,0%). For the stable development of country, by the calculations of international experts, it's necessary, that to the financing of science there were led from 2 till 4% GDP [8].

The level of education and science today is the visit card of state. In Kazakh-

stan on 01.01.2009 year from 16 304 workers, who carried out scientific researches and developments, near 80% has higher professional education (13036 men). But at the perspective the preservation of personnel potential of domestic science is predicted only in the quarter, and more than in the half of directions the personnel potential will weaken. It is apparently from the statistic facts, according to which, during the last 6 years (2003–2008 years) the

number of scientists in Kazakhstan, who carried out scientific research and developments, decreases by 274 men or 1,6%, the specific weight of doctors who are older than 60 years increased from 45,5% till 47,4%, that means the undeniable tendency of personnel aging.

Thereby, the problem of guaranteeing of technological advantages of Kazakhstan with the aim of dynamical development of economy is held back by many aspects, starting from innovative receptivity of country to the technological innovations, and finishing with the absence of conditions for the development of science and scientific potential of republic.

The president of the Kazakhstan N.A. Nazarbaev in his message in 2010 year to the nation of Kazakhstan noted, that «industrial development is our chance in new decade, new possibilities for development of the country» [9]. That's why the lead positions in the world there are occupied by those countries, which are not stopping to reinvest their income that was received from the introducing of new technologies, giving the additional acceleration to them.

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