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Economic Theory

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INDUSTRIAL POLICY FOR UKRAINE: THEORETICAL ASPECTS

Why industrial policy?

At the time of the Soviet Union collapse and of the formation of Ukraine as an independent state the industrial sector held a leading position in its economy. The industry employed 7.8 million people — more than in any other type of activity. In 1991, the output of state industrial enterprises located on the Ukrainian territory was more than 50% of the total output of goods and services in the sectors of the economy and more than 40% of gross added value.

At that time, the Ukrainian industry was part of a single national-economic complex of the USSR, which developed on a planned basis. Due to the fact that after the Soviet Union collapse Ukraine embarked on the transition from planned economy to market economy, industry was forced to go through a period of institutional and economic transformations, the main of elements of which have become state property privatization, liberalization of prices for goods and services and the elimination of the state monopoly on foreign trade.

The expected outcome of such reforms was to bring the volume and structure of industrial production in line with effective demand in the domestic and foreign markets, restructuring and modernization of production facilities, upgrade of production technologies, increasing labour productivity and reducing anthropogenic impact on the environment. It was natural to expect that in connection with large-scale reforms the size of the industrial sector of the economy will contract, but eventually it will become more efficient and competitive, meeting better new challenges to economic security of the government.

In order to support and promote the industry development under difficult market transformations the Ukrainian government has developed and implemented a number of measures in the field of industrial policy. In 1996 the concept of the state industrial policy was adopted (Resolution of the Cabinet of Ministers of Ukraine as on February 29, 2006, № 272). It was replaced by the next Concept of industrial policy published in 2003 (The Decree of the President of Ukraine, as on February 12, 2003, № 102). Then there was adopted the State Programme for the Development of Industry in 2003-2011 (Decree of the Cabinet of Ministers of Ukraine as on 28.07.2003, № 1174). In addition, the regulation of the Ukrainian industry development in a market economy (often contradictory) was carried out by the methods of fiscal and monetary-credit policy¹.

Ultimately, over the past 20 years, the market adjustment actually occurred and now Ukrainian industry, represented mainly by non-state enterprises, manufacture products which are in demand in foreign and domestic markets.

However, firstly, the processes of change by their form were more reminiscent of a spontaneous collapse (especially in the first half of the 1990s — fig.) rather than goal-directed learning and the gradual adaptation to changing conditions of the external environment, and therefore were accompanied by a large social costs: it is enough to note that the number of people employed in industry dropped from 7.8 million in 1991 to 3.5 million in 2009, i.e. more than twice.

Second, the mass restructuring and modernization of production facilities, upgrade of production

¹ You can, for example, mention: preferential tax regime for mining and metallurgical complex, introduced for the period 1999-2002 by the Law of Ukraine as on 14.07.1999, № 934-XIV; a special regime of management, established by the Law of Ukraine “On special economic zones and special regime of investment activity in Donetsk region” as on 24.12.1998, № 356-XIV, which guarantees the business entities tax and customs exemptions provided in the implementation of the priorities for the region’s economic activities of investment projects worth over U.S. \$ 1 million, the revaluation of hryvnia in 2005, when its official exchange rate was close to the interbank rate, which had a strong impact on competitiveness of industrial companies-exporters, etc.

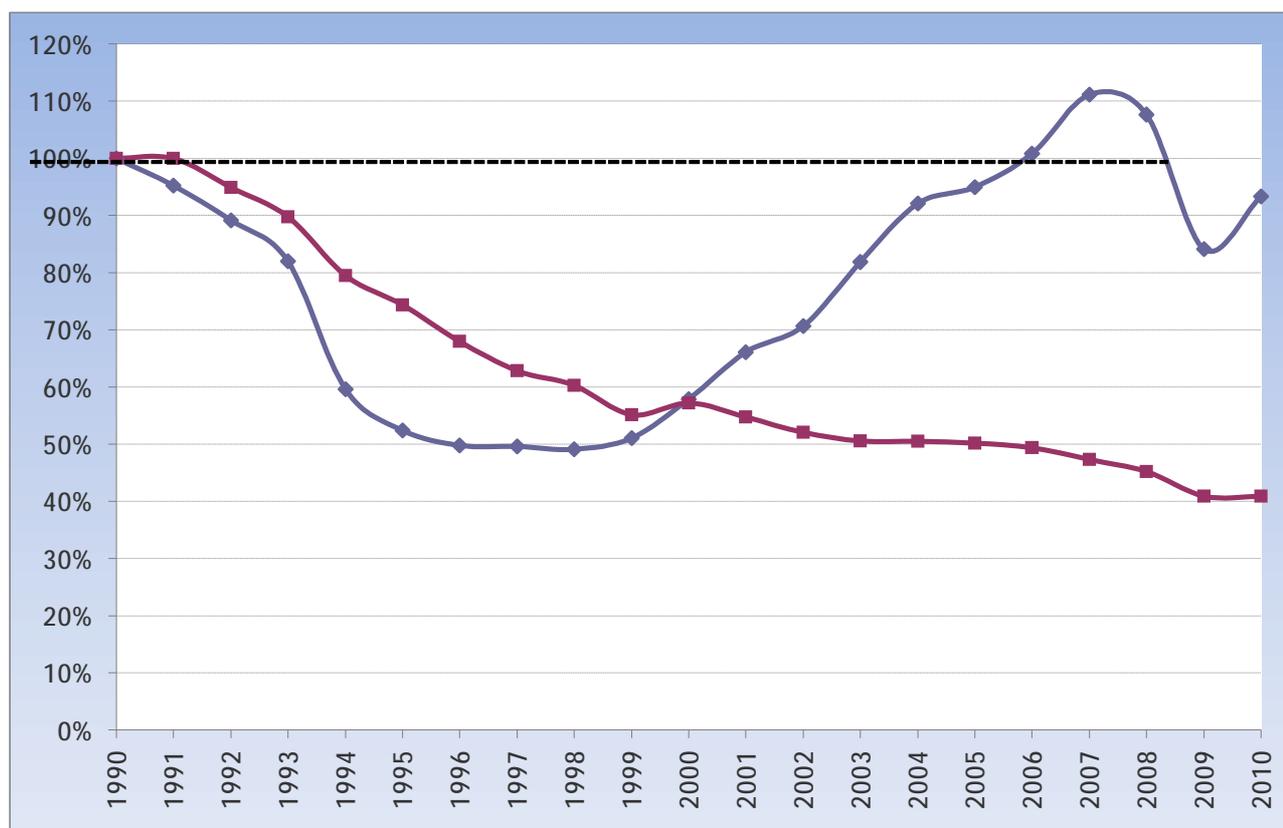


Figure. Dynamics of the Ukrainian industry indicators

technologies have not taken place. Market adaptation occurred mainly not by creating new high-tech industries, but by the extinction of individual enterprises and even entire industries (light industry), whose products were not demanded or were uncompetitive². As for those businesses and industries that have managed to survive (in the mining industry, ferrous metallurgy, power engineering, gas, chemical and petrochemical industries, machine building), many of them still use equipment and technology inherited as a legacy from the former Soviet Union, which determine the productivity and development pressure on the environment³.

Third, from the standpoint of the national security economic component the results of Ukrainian industry's market adaptation to new economic conditions can not be regarded as satisfactory. It proved to be vulnerable to economic shocks, unable to maintain a trajectory of stable functioning in a rapidly changing external environment. Especially, it manifested itself during the global financial crisis in 2009, when industrial output plummeted by more than 20%, which put Ukraine on the brink of default⁴.

Thus, in general, unsatisfactory results of Ukrainian industry development for twenty-year period considered prove the fact that there are required serious changes in

² Here is how a former deputy prime minister, vice-president of holding "Russian Aluminum" A. Livshits characterized the results of market reforms in Russia, where the trends of industrial development, according to the dynamics of production volumes, are approximately the same as in Ukraine, "... we do not even realize that we live in a socialist country. Oligarchs earn money at socialist factories — yet they themselves have built nothing. Their product is carried on the socialist rails, and the current — on the socialist power transmission lines of saws. Repair? Yes, but do not build. All these remain from the country which has not existed for fifteen years already. And we have not seen any introduction of facilities." (See: Livshits A. Now the only way to save money — spend it! // Moskovsky Komsomolets. — 2005. — June 8. — № 1670).

³ For example, in the production of Ukrainian ferrous metals, which has the largest share of goods exported (about 30% of total exports in 2010), an obsolete way of open-hearth steel production in 2000-2008 still accounted for more than 40%, whereas its world average share was less than 5%. And only in crisis 2009 the share of open-hearth steel in Ukraine decreased by 26% (in Russia — up to 10%, on average in the world — up to 1.3%) (See: Steel Statistical Yearbook 2010. — Worldsteel Committee on Economic Studies, Brussels, 2010, p. 35).

⁴ See: <http://www.unian.net/rus/news/news-301123.html>.

industrial policy: it needs either to be rebuilt substantially, or because of its inefficiency it should be rejected at all.

But before raising the issue in a practical level, it is reasonable to address the theoretical aspect of the problem, once again to consider the arguments “for” and “against” the industrial policy in light of the radical change in economic conditions both domestically and overseas⁵. With this purpose in mind the provisions of neoclassical, institutional and evolutionary economic theories will be considered. The study will begin with establishing the boundaries of the subject areas of research — a definition of the concept “industrial policy”.

What is industrial policy?

As the name implies, the industrial policy is some actions of the government (central and/or local) in the industry. That is it is a certain kind of economic policy, along with its widely recognized kinds such as stabilization, financial, trade, etc. policies. However, in contrast to the above-mentioned kinds, which are of general economic character, industrial policy, “... in the strict sense is a sectoral policy; it seeks to promote sectors where intervention should take place for reasons of national independence, technological autonomy, failure of private initiative, decline in traditional activities, and geographical or political balance”⁶.

Many other specialists admit the fact that industrial policy has a sectoral nature⁷. As, for example, noted in the article⁸, “... industrial policy is basically any type of

selective intervention or government policy that attempts to alter the sectoral structure of production toward sectors that are expected to offer better prospects for economic growth than would occur in the absence of such intervention, i.e., in the market equilibrium”.

Changes in the sectoral structure of production are an element of structural transformation (restructuring) of the economy as a whole. Therefore, we can define industrial policy as “... a variety of public actions aimed at guiding and controlling the structural transformation process of an economy”⁹. The emphasis here is on industry, because “... the industrialization process is essential for the transformation of the economy as a whole and it is possible to act on this process in order to guide the entire structural change mechanism”¹⁰.

D. Rodrik speaks from somewhat different positions, maintaining that: “There is no evidence that the types of market failures that call for industrial policy are located predominantly in industry”¹¹. Therefore, for lack of a better, he uses the term “industrial policy” to denote all acts of economic restructuring in favour of more dynamic activities in general, “... regardless of whether those are located within industry or manufacturing per se”¹² and gives examples of such policies, including those of services and of agriculture.

However, such extended interpretation leads away from the traditional understanding of industrial policy, which makes the study of this phenomenon in a historical context more complicated. So J. Foreman-Peck, who

⁵ Industrial policy is on the agenda in the more prosperous countries than Ukraine. Issues of industrial policy are the focus of special reports of the Commission of the European Communities 2002, 2004 and 2005. (See: Industrial policy in an enlarged Europe. — European Commission, 2002, COM (2002) 714 final; Fostering structural change: an industrial policy for an enlarged Europe. — European Commission, 2004, COM (2004) 274 final; Implementing the Community Lisbon Programme: A policy framework to strengthen EU manufacturing — towards a more integrated approach for industrial policy. — European Commission, 2005, COM (2005) 474 final). They pointed out that it plays a key role in achieving the objectives to form a competitive and dynamic knowledge-based economy of the enlarged Europe (see, for example: Industrial policy in an enlarged Europe. — European Commission, 2002, COM (2002) 714 final, p. 7). Interest in this type of policy has increased due to the global financial and economic crisis. In 2009, there was held a round table discussion on the industrial policy issues in the OECD Global Forum on Competition (See: Roundtable on Competition Policy, Industrial Policy and National Champions. — Organisation for Economic Co-operation and Development, 2009, DAF/COMP/GF (2009) 9, 250 pp.). In 2010, the debate about its prospects was published by the influential English-language weekly “The Economist” (see: Industrial policy. — <http://www.economist.com/debate/overview/177>).

⁶ See: Cohen E. Theoretical foundations of industrial policy // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 85.

⁷ See: Pack H., Saggi, K. The case for industrial policy: a critical survey. — World Bank Research Working Paper. — 2006. — № 3839. — 51 pp.; Foreman-Peck J. Industrial policy in Europe in the 20th century // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 36 — 62; Bianchi P., Labory S. From ‘old’ industrial policy to ‘new’ industrial development policies // International handbook on industrial policy. Ed. by P. Bianchi and S. Labory. — Cheltenham, UK, Northampton, MA, USA: Edward Elgar. — 2006. — P. 3 — 27; Soete L. From industrial to innovation policy // Journal of Industry, Competition and Trade. — 2007. — № 7. — P. 273 — 284; Singh A. Competition and competition policy in emerging markets: International and development dimensions. — United Nations, G-24 Discussion Paper Series. — Paper № 18. — 26 pp.

⁸ See: Pack H., Saggi, K. The case for industrial policy: a critical survey // World Bank Research Working Paper. — 2006. — № 3839. — P. 2.

⁹ See: Bianchi P., Labory S. From ‘old’ industrial policy to ‘new’ industrial development policies // International handbook on industrial policy. Ed. by P. Bianchi and S. Labory. — Cheltenham, UK, Northampton, MA, USA: Edward Elgar, 2006. — P. 3.

¹⁰ See: *ibidem*.

¹¹ See: Rodrik D. Industrial policy for the twenty-first century. — Centre for Economic Policy Research, 2004. — CEPR Discussion Papers. — № 4767. — P. 2.

¹² See: *ibidem*.

performed a retrospective analysis of the European industrial policy in the twentieth century, includes only manufacturing industries and infrastructure industries into it. And although he believes that the term “industry” in principle could be extended to any source of employment — be it mining, agriculture or service sector (basing on the fact that the classification of jobs is relatively arbitrary) — but the “... government policies towards agriculture and services generally have differed from those towards industry more narrowly defined, and the field must be limited if it is to be manageable”¹³.

Appeal to the historical aspects of the problem reveals a definite shift in its research paradigm. If before the 1980s industrial policy used to be understood as the actions on the government’s direct intervention in the economy and directive government control over the production apparatus, nowadays “... the term “industrial policy” indicates instead a variety of policies which are implemented by various institutional subjects in order to stimulate firm creation, to favour their agglomeration and promote innovation and competitive development in the context of an open economy. The new industrial policies are therefore mainly industrial development policies, where industry is implicitly considered as the organization, and the strategic management of human competencies and technical capacities”¹⁴.

In modern terminology a traditional sectoral type of industrial policy that affects the relative importance of

individual industries and companies, is known as “vertical policy” and a new functional type — as a “horizontal policy”¹⁵. The latter includes actions, common for a large number of industries and businesses, in the area of legal support to the economic activities, protection of property rights, elimination of administrative barriers, promotion of innovation, etc.^{16 17} The horizontal type of industrial policy is emphasized by the European Commission¹⁸ — the highest executive authority of the EU, which proposes measures to ensure the competitiveness of the European manufacturing industry on the grounds that it is in this industry where most innovations take place.¹⁹

Due to the fact that both vertical and horizontal types of policies include a wide range of actions that can affect various spheres of economic activity, the question of their limitation in terms of the policy object rises. That is why from the whole complex of actions that have an impact on the industry J. Pelkmans singles out those which, in his opinion, should not be attributed to the field of industrial policy: these are policies not specifically for the industry (macro-economic regulation, redistribution of income, the policy in the sphere of labour remuneration, etc.) and those that directly affect the industry, but are designed not only for industry (privatization, regional development, price controls, etc.)²⁰. While it is clear that such a division can not be considered rigorous, since the actions intended not only for industry are difficult to separate from the sphere of industrial policy proper.²¹

¹³ See: Foreman-Peck J. Industrial policy in Europe in the 20th century / J. Foreman-Peck // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 38.

¹⁴ See: International handbook on industrial policy / ed. by P. Bianchi and S. Labory. — Cheltenham, UK, Northampton, MA, USA: Edward Elgar, 2006, p. xv.

¹⁵ See: Foreman-Peck J. Industrial policy in Europe in the 20th century / J. Foreman-Peck // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 38.

¹⁶ See: Väililä T. No policy is an island — on the interaction between industrial and other policies / T. Väililä // EIB Papers. — 2006. — Vol. 11. — № 2. — P. 11.

¹⁷ Some authors define three types of industrial policy: the vertical (strategic trade policy helping to ensure getting a certain rent by some industries or enterprises), horizontal (support for innovation, regardless of the type of industry) and structural changes (temporary support to industries experiencing decline) (See: Väililä T. No policy is an island — on the interaction between industrial and other policies / T. Väililä // EIB Papers. — 2006. — Vol. 11. — № 2. — P. 10). In this paper we will assume that the policy of structural change is an element of vertical industrial policy, thus maintaining the traditional dualistic division.

¹⁸ See: Industrial policy in an enlarged Europe. — European Commission, 2002, COM (2002) 714 final; Fostering structural change: an industrial policy for an enlarged Europe. — European Commission, 2004, COM (2004) 274 final; Implementing the Community Lisbon Programme: A policy framework to strengthen EU manufacturing — towards a more integrated approach for industrial policy. — European Commission, 2005, COM (2005) 474 final.

¹⁹ The message body of the EU Commission noted that: “The Commission is committed to the horizontal nature of industrial policy and to avoid a return to selective interventionist policies” (See: Implementing the Community Lisbon Programme: A policy framework to strengthen EU manufacturing — towards a more integrated approach for industrial policy. — European Commission, 2005, COM (2005) 474 final, p. 3). But, as pointed out further, “... the scope of policy instruments should not be seen just as only very broad horizontal measures. For industrial policy to be effective, account needs to be taken of the specific context of individual sectors. Policies need to be combined in a tailor-made manner on the basis of the concrete characteristics of sectors and the particular opportunities and challenges that they face” (See *ibid*, pp. 3-4). This approach to industrial policy, which provides certain combination of horizontal and vertical measures, was called “the matrix approach” (See: Aiginger K. The Matrix approach to industrial policy / K. Aiginger, S. Siebera // International Review of Applied Economics. — 2006. — Vol. 20. — № 5. — P. 573 — 601).

²⁰ See: Pelkmans J. European industrial policy / J. Pelkmans // International handbook on industrial policy / ed. by P. Bianchi and S. Labory. — Cheltenham, UK, Northampton, MA, USA: Edward Elgar, 2006, P. 46 — 47.

²¹ See: Foreman-Peck J. Industrial policy in Europe in the 20th century / J. Foreman-Peck // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 37.

A similar ambiguity occurs in relation to the purposes of industrial policy. For example, as noted in the study²², “... in most cases industrial policy is pursued with multiple objectives, increasing short-term employment, increased output, better income distribution and enhancing technological capacity. They are often also, rightly or wrongly, non-economic objectives of national pride and prestige, as well as the perceived need to promote “strategic” domestic industries”. There were also mentioned above such objectives as the structural transformation of the economy, stimulating the creation of companies, promoting innovation, competitiveness, etc. All these together give grounds to assert that “... in contrast with most other areas of economic policy, industrial policy does not have a well-identified and universally recognised set of goals to achieve”²³.

To sum up briefly, it can be concluded that it is not possible to strictly delimit the subject area of research — to define an industrial policy. Since there is no clarity in:

(a) what is an object of this policy (what should be understood by industry as the object of policy, how and why it should be distinguished from other sources of employment);

(b) what actions are included into the content of industrial policy (whether there should be included there system-wide actions in the economy that affect industry as well, or actions only in respect of industry, but which may also have system-wide effects);

(c) what goals industrial policy pursues, what should be the final desired outcome of its implementation.

It seems that the above conclusion is not surprising or original. As noted, for example, in the paper²⁴: “The expression “industrial policy” means different things to different people”,²⁵ so any six randomly taken economists, of course, produce at least a dozen different opinions on

this issue²⁶. And more, “... no taxonomy can fully respect the range of views on industrial policy which can be found in the literature”²⁷, and “... while denoted a “policy”, industrial policy lacks most defining features thereof”²⁸.

But the inability to strictly delineate the subject area and give a universal definition of industrial policy does not mean that there is no point searching its specific (special purpose) definitions. In fact, this is a typical problem of classifying different elements into a certain set, which plays an important role in human understanding (e.g., biology, informatics, etc.²⁹). It can be said that industrial policy is (in mathematical terminology) some fuzzy set of elements, characterized by the fact that the membership function can take any value in the interval $[0,1]$, not only the values 0 or 1.³⁰

In order to determine what elements in particular should be included in a “fuzzy set” of industrial policy, and what should not, you need to determine the purpose for which such a restriction is carried out. In this paper this is the study of the theory of the matter. In its complete form it is not a coherent and consistent logical system, but a conceptual unit, or “population” of concepts³¹, which develop in the competition for the best explanation of the same scope of empirical phenomena (phenomena of intersecting spheres) and the prediction of possible scenarios of the events development. Developing such a conceptual unit, in turn, has direct and inverse relation with the evolution of practices “population”, in this case — the practice of industrial policy.

Guided by these considerations, in order to solve the task of many elements of industrial policy, whose composition changed over time and space, there should be defined a “hard disciplinary core” preserving the historical continuity of the subject area of research, to which the scientists appeal (or appealed). The problem,

²² See: Evenett S. Study on issues relating to a possible multilateral framework on competition policy / S. Evenett // World Trade Organization, Working Group on the Interaction between Trade and Competition Policy. — 2003, WT/WGTCP/W/228. — P. 16.

²³ See: Väililä T. No policy is an island — on the interaction between industrial and other policies / T. Väililä // EIB Papers. — 2006. — Vol. 11. — № 2. — P. 9 — 10.

²⁴ See: Roundtable on Competition Policy, Industrial Policy and National Champions. — Organisation for Economic Co-operation and Development, 2009, DAF/COMP/GF (2009)9. — P. 25.

²⁵ Just K. Aiginger quotes 12 different definitions of industrial policy, and he notes that it “... a very small sample of available definitions” (See: Aiginger K. Industrial Policy: A dying breed or a re-emerging Phoenix / K. Aiginger // Journal of Industry, Competition and Trade. — 2007. — № 7. — P. 299).

²⁶ See: Geroski P. European industrial policy and industrial policy in Europe / P. Geroski // Oxford Review of Economic Policy. — 1989. — Vol. 5. — № 2. — P. 20.

²⁷ See: Pelkmans J. European industrial policy / J. Pelkmans // International handbook on industrial policy / ed. by P. Bianchi and S. Labory. — Cheltenham, UK, Northampton, MA, USA: Edward Elgar, 2006. — P. 46.

²⁸ See: Riess A. Industrial policy: a tale of innovators, champions, and B52s / A. Riess, T. Väililä // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 12.

²⁹ See: Zadeh L. Fuzzy sets / L. Zadeh // Information and Control. — 1965. — № 8. — P. 338.

³⁰ See: ibidem, p. 339.

³¹ See: Toulmin S. Human Understanding: The Collective Use and Evolution of Concepts / S. Toulmin. — Princeton : Princeton University Press, 1972. — 520 pp.

however, is that advocates of some economic theories do not just use dissimilar methods of explanation and prediction, but also often turn to the study of various aspects of empirical phenomena, so that the composition and structure of a fuzzy set of industrial policy in the view, for example, of a neo-classics follower can differ significantly from the composition and structure in the view of institutionalism or evolutionism supporters.

Therefore, further analysing the provisions of scientific theories in the field of industrial policy we will proceed from such a broad understanding of its content, which makes it possible to consider the arguments from different points of view. And in order for the scope of this analysis not to be unlimited, it is proposed to use as a restrictor an analogue to a philosophical principle of intentionalism, according to which any action should be evaluated in terms of its purpose. The idea is to consider the theoretical basis of only those actions that have the intention to influence the industry — production (extraction, transfer, manufacture, processing) of wealth³². This means that there will be considered both “vertical policy” — in the part that has to change the relative importance of the industry in general and / or its individual sectors, and “horizontal policy” — as far as it relates to institutions, innovation etc. in the industry.

Neoclassical foundations of industrial policy

In the usual neoclassical assumptions, free competition of the economic agents rationally acting in their self-interest, who are fully informed and do not have market power, leads to a Pareto efficient use of scarce resources. Therefore, the grounds for the government intervention in this market mechanism arise if there are obstacles to free competition, known as market failures. However, this intervention itself may also be associated with failures, but now the government failures. So the neo-classical arguments “for” industrial policy can be countered by no less persuasive arguments “against.”

Market failures. In the context of industrial policy incomplete information, non-competitive markets and externalities are counted among market failures that provide the grounds for certain forms of state intervention³³.

Incomplete information. From the standpoint of producers incomplete information may result in incorrect assessment of individual commercial projects profitability. The problem gets more complicated if you plan to release a new product profitability of which has not yet been rated by the market, as well as in the case of related investments³⁴ when uncertainty of investment in one activity (e.g., ore processing), gives rise to uncertainty in the investment associated with other linked activities (e.g., iron and steel production). As a result, it leads to errors in assessing business prospects, reduces the potential level of business activity and investment in the economy³⁵. From the standpoint of consumers incomplete information about the quality of new products forces them to be guided by the average estimates of known comparable benefits. In this situation, there is a risk that businesses offering goods quality above average will be priced out of the market; which is called adverse selection.³⁶ In addition, corporations can specially create barriers to the movement of information, deliberately spread incomplete and/or false information and develop strategies that create market imperfections³⁷. Opposition from the public authorities can consist in developing a strong competitive policy to restore conditions of fair competition in a situation close to full information, or in implementing a strategic industrial policy through which they play an active role in encouraging non-opportunistic behaviour in the industries concerned³⁸.

Non-competitive markets. Competition problems in markets, necessitating a certain degree of economic agents' market power, exist due to a number of reasons. This may be the control of scarce resources, high fixed costs, economies of scale. As noted in the paper³⁹, “... in

³² This definition goes beyond the scope of the study of wealth production through natural processes of growth and development of living organisms (agriculture), as well as a variety of activities that do not have an explicit material form (services).

³³ See: Buigues P.-A. Industrial policy in Europe, Japan and the USA: Amounts, mechanisms and effectiveness / P.-A. Buigues, K. Sekkat. — Palgrave-McMillan, 2009, p. 10; Cohen E. Theoretical foundations of industrial policy // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 86; Navarro L. Industrial policy in the economic literature. Recent theoretical developments and implications for EU policy. — European Commission, Enterprise Directorate-General. — 2003. — Enterprise Papers № 12. — P. 3.

³⁴ See: Rodrik D. Industrial policy for the twenty-first century / D. Rodrik. — Centre for Economic Policy Research, 2004. — CEPR Discussion Papers. — № 4767. — P. 8.

³⁵ See: Buigues P.-A. Industrial policy in Europe, Japan and the USA: Amounts, mechanisms and effectiveness / P.-A. Buigues, K. Sekkat. — Palgrave-McMillan, 2009. — P. 10.

³⁶ See: Akerlof G. The market for “lemons”: Quality uncertainty and the market mechanism / G. Akerlof // The Quarterly Journal of Economics. — 1970. — Vol. 84. — № 3. — P. 488 — 500.

³⁷ See: Cohen E. Theoretical foundations of industrial policy / E. Cohen // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 86.

³⁸ See: *ibidem*.

³⁹ See: *ibid.*, p. 87.

an industry characterised by high fixed costs (and, thus, economies of scale) the first firm in a market enjoys a crucial first-mover advantage that prevents another firms from entering that market. In essence, high fixed costs and economies of scale constitute entry barriers behind which the first mover captures rents to the detriment of potential entrants and consumers". If economies of scale are so great that one company can satisfy the entire market demand, then we can speak of natural monopolies, in the sense that the barriers to entry are based on natural laws of the nature. In addition, such barriers can be created artificially by the state, as is known from the history of industrial policy: "19th century technology determined that infrastructure business dwarfed the scale of manufacturing enterprises, and of these businesses the most expensive was railways. Railways and roads were needed to carry troops to the frontiers, and telecommunications to tell them what to do. ... For security reasons, communication networks, the postal service, and roads were traditionally state monopolies, as were electric telegraph and telephone, except when finance was not available"⁴⁰. Solutions to the problem of non-competitive markets include price control (usually for natural monopolies' output), directive re-creation of competitive environment (by means of forced division of enterprises), facilitation of entering the market (by easing regulatory requirements, the allocation of grants for start-ups, etc.).

Externalities. Knowledge is a typical example of externalities in the context of industrial policy. Once obtained, it can be absorbed by plenty of economic actors at a relatively low cost (compared to the cost of its generation). Therefore, the social return on private

investment in knowledge generation is greater than the individual investor's level of profitability, and the aggregate efforts of enterprises aimed at obtaining knowledge — R & D performance, opening new market opportunities (the so-called "self-discovery")⁴¹ and others — may be lower than a socially optimal level. A similar problem is related to the costs of enterprises on personnel training, from which other organizations benefit under conditions of staff high mobility. As is the case with other externalities, it weakens the incentives to provide the optimal level of training due to fears of economic losses⁴². Externalities arise in the processes of coordination in space and time — when creating new products requires large synchronous investments in associated activities, the organization of which is not provided by the market mechanism⁴³, and the geographic concentration of industry, due to economies of scale⁴⁴, the presence of rare or difficult to move factors of production within the territory, etc. The latter can be both positive (due to shared infrastructure, the concentration of skilled workers, and diffusion of tacit knowledge) and negative (due to accumulation of declining troubled industries, environmental problems)⁴⁵. Conventional neoclassical prescriptions addressing externalities are to provide subsidies (monetary, credit, tax, etc.) and government procurement — to enhance the positive externalities (for example, by encouraging research and development spin-off), and in levying additional mandatory payments (Pigou taxes) and fines — to reduce negative externalities (for example, by increasing the costs of environmental contaminants).

Government failures. To correct market failures, the government authorities intervene in economic

⁴⁰ See: Foreman-Peck J. Industrial policy in Europe in the 20th century / J. Foreman-Peck // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 41.

⁴¹ The "self-discovery" means the diversification of the industrial structure by introducing new product lines that have been domesticated by adapting the already known technologies for their production and marketing to local conditions. As noted by D. Rodrik, "self-discovery" is different from the R & D and innovation in their usual sense, since it "... is not coming up with new products or processes, but "discovering" that a certain good, already well established in world markets, can be produced at home at low cost. This may involve some technological tinkering to adapt foreign technology to domestic conditions, but this tinkering rarely amounts to something that is actually patentable and therefore monopolizable"(See.: Rodrik D. Industrial policy for the twenty-first century. — Centre for Economic Policy Research, 2004, CEPR Discussion Papers, № 4767, p. 9).

⁴² See: Buigues P.-A. Industrial policy in Europe, Japan and the USA: Amounts, mechanisms and effectiveness / P.-A. Buigues, K. Sekkat. — Palgrave-McMillan, 2009. — P. 13.

⁴³ See: Rodrik D. Industrial policy for the twenty-first century. — Centre for Economic Policy Research, 2004, CEPR Discussion Papers. — № 4767. — P. 12 — 14.

⁴⁴ Uneven spatial deployment of productive forces, due to economies of scale and imperfect competition, explains the new economic geography. According to this theory rationally acting economic agents, taking into account the factor of transport costs, prefer to concentrate in one region and not uniformly distribute throughout the territory. Characteristics of their location are determined by the balance of benefits from economies of scale for enterprises and on a variety of products for customers, on the one hand, and losses from the growth of interregional transport costs, on the other hand (See: Krugman P. Increasing returns and economic geography / P. Krugman // Journal of Political Economy. — 1991. — Vol. 99. — № 3. — P. 483 — 499; Boschma R. Why is economic geography not an evolutionary science? Towards an evolutionary economic geography / R. Boschma, K. Frenken // Journal of Economic Geography. — 2006. — № 6. — P. 275).

⁴⁵ See: Buigues P.-A. Industrial policy in Europe, Japan and the USA: Amounts, mechanisms and effectiveness / P.-A. Buigues, K. Sekkat. — Palgrave-McMillan, 2009. — P. 14 — 15.

processes (through taxes, subsidies, procurement, regulatory norms, etc.), but their actions can also result in failures — even less efficient use of scarce resources than without such intervention. In the context of industrial policy such failures include imperfect information, self-serving behaviour of officials, and conflicts of industrial policy of the state with other types of economic policy.

Imperfect information. The administrative bureaucracy that manages the state, as opposed to those economic entities that are directly involved in market transactions is less aware of the prices, costs and benefits of a business, and ways of its development, the prospects for changes in product mix, the reorientation of markets, etc.: “... the public sector is not omniscient, and indeed typically has even less information than the private sector about the location and nature of the market failures that block diversification. Governments may not even know what it is they do not know”⁴⁶. Ignorance of public authorities is also associated with defining the list and selecting the best tools to achieve their goals. This may be a variety of means such as monetary (taxes, fines, grants) and non-monetary (intellectual property rights, government regulation of mergers and acquisitions, tariffs, non-tariff measures, including quotas and licenses)⁴⁷. The use of each of them is associated with introducing distortions in the economic processes and hard-to-predict long-term consequences, especially when not one instrument in isolation, but several in a complex are used.

Self-serving behaviour of officials. If, in accordance with the preconditions of rational self-interest of economic agents, officials pursue primarily personal rather than public interests, their actions may result in inefficient resource allocation (allocation of subsidies not to the industries that really need them, excessively high or low tariffs, etc.) and brought-in distortion of competition — regardless of whether they are well aware of the problems of the market. When in order to

implement the industrial policy the regulatory bodies are set up, self-serving behaviour of officials can lead to their “capture” (“regulatory capture”), which means that these bodies are starting to perform their functions in the interests of those firms whose activities they are supposed to regulate⁴⁸. This gives some grounds to conclude that economic regulation in general is not conducted in the public interest, but it is a process by which the groups of interests are trying to promote their own (private) interests.⁴⁹ “Capture” of regulatory bodies is usually achieved by methods of corruption (through bribes, providing the officials with various benefits, such as guarantee of future employment, etc.), although other methods can also be used for this purpose⁵⁰.

Conflicts of industrial policy with other types of the state economic policy. In addition to industrial policy there can be called at least two types of economic policy that are linked to the government support of business: it is a trade policy (aimed at the interests of domestic producers and consumers) and competition policy (aimed at ensuring the effective functioning of the market coordination mechanism and control of non-competitive business practice)⁵¹. All of them have overlapping application domains, and therefore their simultaneous use, which is a usual practice, is fraught with contradictions and even conflicts. A typical example of such contradictions is those that arise while implementing industrial policy in the form of support for “infant industries”. Such support, usually appealing to the market failures (in the form of poorly functioning capital markets, the availability of information barriers to entering the sector), suggests the establishment of special trade barriers and taking measures to protect against competition, which is clearly contradictory to today’s competitive and trade policies, often designed to ensure greater openness of national economies.⁵²

Thus, as it follows from the above list of the state

⁴⁶ See: Rodrik D. Industrial policy for the twenty-first century / D. Rodrik. — Centre for Economic Policy Research, 2004, CEPR Discussion Papers. — № 4767. — P. 16.

⁴⁷ See: Buigues P.-A. Industrial policy in Europe, Japan and the USA: Amounts, mechanisms and effectiveness / P.-A. Buigues, K. Sekkat. — Palgrave-McMillan, 2009. — P. 21 — 22.

⁴⁸ See: Posner R. Theories of economic regulation // Bell Journal of Economics, 1974, Vol. 5, № 2, pp. 335-358.

⁴⁹ See: *ibid.*, p.343.

⁵⁰ To “capture” the interest group’s regulatory bodies, in addition to using bureaucrats’ self-interested behavior for their own purposes, there may also be used such tools as threats to reputation, specially selected information about the problems of the business regulated, etc. (See: Dal B? E. Regulatory capture: a review // Oxford Review of Economic Policy. — Vol. 22. — № 2. — P. 220). However, from the standpoint of economic methodology an explanation through the economic interests is of a dominant value.

⁵¹ See: Buigues P.-A. Industrial policy in Europe, Japan and the USA: Amounts, mechanisms and effectiveness / P.-A. Buigues, K. Sekkat. — Palgrave-McMillan, 2009. — P. 22.

⁵² See the discussion of the arguments “for” and “against” public support for developing industries in: Pack H. The case for industrial policy: a critical survey / H. Pack, K. Saggi. — World Bank Research Working Paper. — 2006. — № 3839. — 51 pp. One of the best-known works on the problem, which presents the arguments against such policies is the article by R. Baldwin (See: Baldwin R. The case against infant-industry tariff protection / R. Baldwin // Journal of Political Economy. — 1969. — Vol. 77. — № 3. — P. 295 — 305).

failures, its actions aimed at improving the situation in the industry, does not guarantee success. The measure of its estimation in neoclassical economics is the Pareto criterion of improvement or more operational criterion of potential Pareto improvement, involving a comparison of costs and benefits (cost-benefit analysis). Therefore, in order to verify the effectiveness or ineffectiveness of the chosen option of industrial policy it is necessary to compare the associated costs and benefits. It is obvious that in practice it is very difficult to do, both because it is problematic to correctly measure the benefits of the government intervention aimed at correcting market failures, and to calculate the associated costs in the light of emerging side effects.⁵³

Institutional Grounds of Industrial Policy

In institutional theory, in contrast to the neoclassical one, the emphasis in the rationale of industrial policy are shifted from finding the optimal distribution of scarce resources to the analysis of institutions — the spontaneous and formal rules with enforcement mechanisms to implement them — that promote or hinder the success of such policy, and transaction costs accompanying relations of economic agents. Therefore, for example, differences in the economies' productivity in the adjacent countries (South Korea and North Korea, former West and East Germany, etc.), incomprehensible from the standpoint of neoclassical economics, can be easily explained by differences in the institutes' efficiency.

This utmost importance attached to the rules is derived from the basic premises of the institutional theory, according to which economic actors operating in their own interests are not fully informed and rational, yet "... are capable only of very approximate and bounded rationality"⁵⁴.

And what they can and can not do in this situation

is determined by the institutes that constrain, structure and stimulate individual behaviour. Therefore, the grounds for government intervention arise when the purpose of industrial policy requires to improve existing or to adapt new institutes, thus reducing transaction costs, i.e. because of what might be called *rules failures*.

The institutional grounds of industrial policy include the arguments in favour of establishing special regulations in the areas of industrial innovation, industrial diversification and global cost formation chains.

Industrial innovation. Modern economic theory has moved away from understanding innovation as a mechanical process in which greater financial investments automatically provide greater benefits (as it used to be assumed, the increase in expenditure on R & D leads to an increase of innovations), in the direction of organic socio-cultural process in which a key role is played by intangible factors, the ability of economic agents to learn and behave cooperatively.⁵⁵ A special social order based on "long-term rules" of interaction, creating conditions for long-term economic planning⁵⁶ and cooperation, not only competition of economic entities — what has become known as "co-opetition"⁵⁷ — is now considered a prerequisite for their successful actions in the field of innovation, which play a key role in ensuring the competitiveness of the industry. In modern conditions "... innovation in industries is the result of the interaction of different actors (firms, universities, public agencies, financial organizations...) that have collaborative relationships of formal and informal types"⁵⁸ and, for example, in such innovative areas of business as pharmaceuticals and biotechnology co-operation of large, small and new firms is pervasive⁵⁹.

Usually mentioned ground for state intervention in the processes of such relationships is that markets provide insufficient incentives for firms to cooperate⁶⁰. However,

⁵³ For evaluation of industrial policy J. Foreman-Peck offers two approaches, based on the comparison of costs and benefits: the first is analysis of the impact of the state's specific interventions (such as special tariffs, individual projects, such as Concorde, the subsidy programs of R & D and investment promotion and special regimes in power generation, etc.), the second is the analysis of an industrial policy for the economy in general (See: Foreman-Peck J. Industrial policy in Europe in the 20th century / J. Foreman-Peck // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 52). As the author himself notes, none of them is entirely satisfactory. The obvious reason for this is the difficulty to eliminate the influence of those variables that are not under analysis. Therefore estimates of various types of industrial policies carried out by him (see *ibid.*, pp. 52 — 58) contain, apparently, the inevitable elements of "story telling".

⁵⁴ See: Simon H. Altruism and economics / H. Simon // The American Economic Review. — 1993. — Vol. 83. — № 2. — P. 156.

⁵⁵ See: Nauwelaers C. Path-dependency and the role of institutions in cluster policy generation / C. Nauwelaers // Cluster Policies — Cluster Development? Ed. by E. Mariussen. — Stockholm, Nordregio Report 2001. — № 2. — P. 95.

⁵⁶ See: Вишнеvский В. Инновации, институты и эволюция / В. Вишнеvский, В. Деметьев // Вопр. экономики. — 2010. — № 9. — С. 41 — 62.

⁵⁷ See: Brandenburger A., Nalebuff B. Co-opetition: A revolution mindset that combines competition and cooperation: the game theory strategy that's changing the game of business / A. Brandenburger, B. Nalebuff. — New York : Doubleday Currency, 1996. — 290 pp.

⁵⁸ See: Malerba F. Innovation and the dynamics and evolution of industries: Progress and challenges / F. Malerba // International Journal of Industrial Organization. — 2007. — № 25. — P. 677.

⁵⁹ See: *ibid.*, p. 685.

⁶⁰ See: Cohen E. Theoretical foundations of industrial policy / E. Cohen // EIB Papers. — 2006. — Vol. 11. — № 1. — P. 93.

in this case, it is not enough to explain markets, market failures and welfare arising from the analysis of the independent egoistic individuals' interaction in neoclassical terms. Institutional theory assumes that individuals "... individuals do not form their preferences in isolation from other individuals, but in response to both public events and information that is widely broadcast"⁶¹. In addition, in organizations their choice is limited by routines. And in some organizations these are different routine, subject to different purposes, not always commercial. It is obvious that the explanation of failure (or success) of these dissimilar organizations' cooperation goes beyond the scope of neoclassical theory application. Their (failures') cause is not markets' failure, but failure of the rules mentioned above, in particular, their short-term and non-partner character. And it is the state interested in economic growth that can provide the support for the "long rule" partnership relations of diverse organizations (instead of "short" and non-partner) — again, taking into account the possible government failures, corruption, etc. "The state's role — as the article⁶² maintains — is therefore to act as guarantor of cooperative behaviour for each of the partners. To illustrate, in Japan, the Ministry of International Trade and Industry brings businesses together in projects and guarantees that each partner acts fairly"⁶³.

Sectoral diversification in the industry leading to structural changes and promoting the growth of the economy and public welfare⁶⁴ requires the development of production innovative for a given country or region of the goods. Usually it does not require radical innovation based on research and development⁶⁵, and can be achieved by adapting goods and

technologies of their production, already known in the world, to local conditions — what was called above the self-discovery. As is the case with innovations, business organizations can not by themselves solve the problems of this adaptation due to the challenges caused by information and coordination failures⁶⁶. The solution can be found in taking measures of institutional nature, involving the rules formation and organization a process of public-private cooperation on their basis — through joint research and finding a consensus on where exactly information and coordination externalities arise, and thus, what can be the objectives of industrial policy in this area, and how they should be achieved. "The right model for industrial policy, — says D. Rodrik, — is not that of an autonomous government applying Pigovian taxes or subsidies, but of strategic collaboration between the private sector and the government with the aim of uncovering where the most significant obstacles to restructuring lie and what type of interventions are most likely to remove them"⁶⁷. In this context, the usual discussions about instruments, costs and results of government intervention in the economy of industry have no fundamental significance. And what is more important is to have a process available that helps to identify the areas of desirable interventions. Governments that understand this will be constantly looking for the ways by which they can contribute to structural changes and cooperation with the private sector⁶⁸.

G l o b a l v a l u e c h a i n s . Processes of globalization and liberalization of international trade have led to a change in the situation in the global economy. Now, as experts of the Asian Development Bank say⁶⁹, an

⁶¹ See: Simon H. Altruism and economics / H. Simon // *The American Economic Review*. — 1993. — Vol. 83. — № 2. — P. 160.

⁶² See: Cohen E. Theoretical foundations of industrial policy / E. Cohen // *EIB Papers*. — 2006. — Vol. 11. — № 1. — P. 92.

⁶³ Explanation of whether cooperation among economic agents is expedient, in connection with going beyond the neoclassical issues, can be found in the evolutionary ideas of selection and fitness (See: Simon H. Altruism and economics / H. Simon // *The American Economic Review*. — 1993. — Vol. 83. — № 2. — P. 156), particularly in the socio-biological theory of multi-level (individual or group) selection, according to which group selection is favorable for cooperative subpopulations of subjects (see: Wilson DS, Wilson EO *Rethinking the theoretical foundation of sociobiology* // *The Quarterly Review of Biology*. — 2007. — Vol. 82. — № 4. — P. 327 — 348).

⁶⁴ The proof of connection between industry diversification and economic growth and social well-being is given in the article: Imbs J., Wacziarg R. Stages of diversification / J. Imbs, R. Wacziarg // *American Economic Review*. — 2003. — Vol. 93. — № 1. — P. 63 — 86. Based on the analysis of statistical indicators of more than 90 countries around the world it is justified, that "... economies grow through two stages of diversification. At first, sectoral diversification increases, but there exists a level of per capita income beyond which the sectoral distribution of economic activity starts concentrating again. In other words, sectoral concentration follows a U-shaped pattern in relation to per capita income" (See: *Ibid*, p. 63).

⁶⁵ Many enterprises in the countries with the newly industrialized economies (South Korea, Singapore, Hong Kong, China) significantly reduced the technological lag from the world leaders through "behind-the-frontier innovation" (innovation behind the leaders) — continued gradual improvement of already existing products and production processes, usually requiring no research and development (See: *Asian Development Outlook 2003: Competitiveness in Developing Asia*. — Asian Development Bank : Oxford University Press. — 2003. — P. 263).

⁶⁶ See: Rodrik D. Industrial policy for the twenty-first century. — Centre for Economic Policy Research, 2004, CEPR Discussion Papers, № 4767, P. 9 — 14.

⁶⁷ See: *ibid.*, p. 3.

⁶⁸ See: *ibid.*, p. 38.

⁶⁹ See: *Asian Development Outlook 2003: Competitiveness in Developing Asia*. — Asian Development Bank : Oxford University Press, 2003. — P. 211.

explanation of how and where manufactured goods are produced is not a simple task — their design, manufacture, distribution and service are divided into elements, which are scattered around the world. It is a system of international production-distribution relationships, which are called “global value chains” (GVCs), in which usually more laborious stages of the process are moved onto the territory of developing countries⁷⁰. GVCs, which are currently the key and stable structural features of the global economy⁷¹, form both new opportunities and new threats. On the one hand, participation in these chains allows firms from different countries (especially less developed countries) to enter the global production structures, improve production processes and products in accordance with the GVCs standards, climb up the technological ladder and get a wide access to international markets. Moreover, by some estimates, “... the benefits of trade liberalization that are accompanied by the establishment of international supplier chain arrangements between firms in industrial and less developed countries can be 10 to 20 times larger than those accruing from trade liberalization alone”⁷². And, on the other hand, in order to export successfully is no longer enough to produce competitive products effectively, “... developing country suppliers of labour intensive products must now not only overcome the traditional trade barriers — which remain high for certain developing country exports — but also must become part of some trade network in order actually to export”⁷³.

To overcome these barriers successfully a special new industrial policy is required. It implies that the government: (1) helps enterprises of the country to adapt to the existing GVCs rules — by informing about what alternative GVCs exist and what key requirements must be met to participate in them, what standards apply here, and what to do to achieve them, the organization of collective actions in terms of creating the infrastructure necessary to meet logistical requirements, etc.,⁷⁴ (2)

promotes the formation of new international rules that are more favourable for domestic enterprises — through the organization of national trading companies, participation in collective actions by developing countries to harmonize and eliminate double standards, monitoring compliance with the rules of competition from large multinational companies, their policy of mergers and acquisitions, etc.⁷⁵

Describing the institutional grounds of industrial policy in general, it is important to note that institutes, when considered as a factor of production, are among the non-mobile factors. Therefore, any country can copy the manufacturing processes, import equipment, attract qualified personnel from abroad, but can not borrow the successful institutes.⁷⁶ Their creation and development are a country-specific time-consuming process determined by the circumstances of time and place, so effective institutes have always appeared as the result of a long chain of historical milestones — the ascent from the original factors of geography to the immediate factors derived from them, including institutional.⁷⁷ But such a definition of the problem already touches the genesis problem of the institutions themselves, the study of which requires application of another — evolutionary — paradigm.

The evolutionary grounds of industrial policy

In evolutionary economics, in contrast to the neoclassical and institutional, the motives of human behaviour are determined, apart from considerations of rationality and social factors, by the natural desire for survival. The behaviour can be both selfish and altruistic, because in the evolutionary process it is not individual survival, as such, but rather the successful transfer of heredity units, or genes is of the real value, so that in certain circumstances for the individual it may be more profitable to promote the reproduction of related individuals even at the expense of their lives acting self-sacrificingly for the benefit of others⁷⁸. Competition for

⁷⁰ See: Global value chains in a postcrisis world: a development perspective / Olivier Cattaneo, Gary Gereffi, and Cornelia Staritz, editors. — The World Bank, The International Bank for Reconstruction and Development, 2010, p. xv.

⁷¹ See: *ibid.*, p. 6.

⁷² See: Asian Development Outlook 2003: Competitiveness in Developing Asia. — Asian Development Bank: Oxford University Press, 2003, p. 237.

⁷³ See: Haque I. Rethinking industrial policy. UNCTAD Discussion Papers / I. Haque. — 2007. — № 183. — P. 9.

⁷⁴ See: Humphrey J. Upgrading in global value chains — International Labour Organization / J. Humphrey. — 2004, Working Paper № 28. — P. 28; Kaplinsky R. The role of standards in global value chains and their impact on economic and social upgrading. — World Bank, 2010, p. 14.

⁷⁵ See: Haque I. Rethinking industrial policy. UNCTAD Discussion Papers. — 2007. — № 183. — P. 10; Humphrey J. Upgrading in global value chains — International Labour Organization, 2004, Working Paper № 28, p. 28; Kaplinsky R. The role of standards in global value chains and their impact on economic and social upgrading / R. Kaplinsky. — World Bank, 2010. — P. 15 — 16.

⁷⁶ See: Asian Development Outlook 2003: Competitiveness in Developing Asia. — Asian Development Bank : Oxford University Press, 2003, p. 227.

⁷⁷ See: Diamond J. Guns, germs, and steel: the fates of human societies / J. Diamond. — New York : W.W. Norton & Company, Inc., 1997. — 480 pp.

⁷⁸ See: Wilson D.S. Rethinking the Theoretical Foundation of Sociobiology / D.S. Wilson, E.O. Wilson. — The Quarterly Review of Biology, 2007. — Vol. 82. — № 4. — P. 327 — 348.

scarce resources is explained not by a free choice of independent actors, but by a dominance hierarchy in the population that appear in groups of living organisms in order to minimize aggression among individuals competing for limited resources. As a high social rank automatically gives access to all available resources natural selection favoured the trends of the struggle for raising the social status⁷⁹.

Institutions, which were discussed above, are also considered as being epigenetic in nature. They, like any cultural and behavioural superstructure, are grounded on a biological basis — in the sense that are formed by living creatures that are the carriers of genetic information and are guided by instincts — innate reactions to external and/or internal stimuli, while institutes develop “... through social learning of ‘rules of conduct’ that starts from primitive, genetically fixed, forms of social behaviour and add on new elements by trial and error”⁸⁰.

Using ideas borrowed from biology⁸¹ (the concept of units of evolution, the processes of variation, selection and heredity)⁸², evolutionary theory explores the economies’ changes in time and space, but not any changes, but only those in which complex open systems adapt to their environment, a variety develops from common origins and eventually a new design is accumulated.⁸³ Taking into consideration a range of its application, the evolutionary grounds of industrial policy can be found in the area of national innovation systems (NIS) and industrial clusters.

National innovation systems are holistic networks of organizations and institutes whose interaction determines the features of the innovation performance in individual countries. The concept of NIS is based on the idea of “techno-nationalism.”⁸⁴ It means that innovation efficiency of each state is determined by the specifics of national ways of interacting economic agents that have different types of knowledge and skills (companies, research institutes, universities, etc.), in the creating and using innovations.⁸⁵ Posing this question itself is part of a broader set of problems of genetic and cultural co-evolution and the formation of national intelligence features.

A long-time scientific debate about what has a greater effect on intelligence — nature or nurture — still remains a subject of controversy among modern environmentalists and geneticists⁸⁶, and so far the chances of the parties are about 50 to 50⁸⁷. In any case, it is obvious that national characteristics do matter. And evolutionary economic theory which refers to the arguments of both parties “... makes a major contribution to understanding the importance of country-specific features for innovation. The concepts of national innovation system and technological trajectory highlight countries’ particular institutional characteristics and the uniqueness of each nation’s history. ... From this perspective of national specificity and institutional dynamism, industrial policy gains a new legitimacy”⁸⁸.

OECD experts see the grounds for the state

⁷⁹ See: Palmer J. *Evolutionary Psychology: the Ultimate Origins of Human Behaviour* / J. Palmer, L. Palmer. — London : Allyn and Bacon, 2002. — 319 pp.

⁸⁰ See: Witt U. *Evolutionary Economics* / U. Witt. — Max Planck Institute of Economics, The Papers on Economics and Evolution. — 2006. — № 0605. — P. 13.

⁸¹ In relation to the biological ideas in evolutionary economics two trends can be defined. Representatives of the first one substantiate that biological evolution theory is the carrier of general ontological logic that can be applied to all kinds of evolutionary processes, including social. Representatives of the latter, by contrast, argue that a generalized Darwinism is not capable to cover important features of cultural development, and therefore represents no more than analogy, which can be misleading (See: Stoelhorst J.W. *The Explanatory Logic and Ontological Commitments of Generalized Darwinism* / J. W. Stoelhorst // *Journal of Economic Methodology*. — 2008. — Vol. 15. — № 4. — P. 343).

⁸² See: Stoelhorst J.W. *The Explanatory Logic and Ontological Commitments of Generalized Darwinism* / J. W. Stoelhorst // *Journal of Economic Methodology*. — 2008. — Vol. 15. — № 4. — P. 345.

⁸³ See: *ibid.*, p. 358.

⁸⁴ See: *National innovation systems: a comparative analysis* / ed. by R. Nelson. — New York Oxford : Oxford University Press, 1993. — 525 p.

⁸⁵ See: *National Innovation Systems*. — OECD, Committee for Scientific and Technological Policy, 1997. — P. 9.

⁸⁶ On the one hand, there are compelling arguments in favor of social conditionality of intelligence: “... a growing child is shaped by the schooling she receives, the importance her family places on intelligence, the learning materials at hand, and a hundred other social factors” (See: <http://www.psychologicalscience.org/index.php/publications/observer/obsonline/what-makes-a-nation-intelligent.html>). But on the other hand, the biological aspects also play an important role and “... the position of environmentalists that over the course of some 100,000 years peoples separated by geographical barriers in different parts of the world evolved into ten different races with pronounced genetic differences in morphology, blood groups, and the incidence of genetic diseases, and yet have identical genotypes for intelligence, is so improbable that those who advance it must either be totally ignorant of the basic principles of evolutionary biology or else have a political agenda to deny the importance of race. Or both” (See: Lynn R. *Race differences in intelligence: an evolutionary analysis*. — Washington Summit Publishers Augusta, GA, A National Policy Institute Book, 2006. — P. 159 — 160).

⁸⁷ See: Tayyari F. *The genetic basis of intelligence* // *The Science Creative Quarterly*, August 2004. — Access mode : <http://www.scq.ubc.ca/the-genetic-basis-of-intelligence/>.

⁸⁸ See: Cohen E. *Theoretical foundations of industrial policy* / E. Cohen // *EIB Papers*. — 2006. — Vol. 11. — № 1. — P. 89.

intervention in the NIS context not in the usual market failures, but in systematic failures: lack of interaction among actors in the system, the disparity between basic research in the public sector and applied research in industry; malfunctions of the institutes of technology transfer; lack of the enterprises' capability to receive and process information⁸⁹. Accordingly, their proposed policy measures include the development of business networking and the innovation potential of enterprises.⁹⁰

As far as NIS is concerned, however, this rationale looks not quite correct: the concept of a system and systemic failures is neutral in relation to the national identity (caused by ethnic, cultural and historical community of people), while it has a key significance to the concept of NIS. Systemic weaknesses in the NIS are characterized by, first, dependence on the characteristics of previous development (path dependence), and, secondly, the resulting from it national characteristics of the country, characterized by a unique set of genetic and cultural factors. Therefore, it is more correct in this context to use evolutionary terminology, taking into account the above mentioned aspects, and to identify NIS shortcomings as the *fitness failures*. Natural processes of variation, selection and heredity can lead to the consolidation and dissemination of organizational routines⁹¹ that do not correspond to the national specificities of the country and impeding the innovative development of the industry.⁹² Therefore, it is required from the government (taking into account restrictions on its possible failures) to organize the process of focused nationally-oriented cultivation of the organizational routines that determine the ability of the innovation process participants to take part in networking, to find and identify relevant information and technology, etc. A criterion of

such cultivation's success is not the current economic performance, taking into account (institutionalism), or not (neoclassic) transaction costs, but the ability of economic agents to survive and reproduce, estimated through development indicators (e.g., through indicators of the life cycle of technology, technological limits and breaks⁹³).

Industrial clusters can be defined as space agglomerations of producers, united by intensive and diverse networks of relationships⁹⁴. The concept of industrial cluster is different from the usual industrial agglomeration by the fact that in addition to the spatial concentration of enterprises a cluster implies functional connections among the parties and complementary expertise⁹⁵.

Like many socio-economic phenomena, the clusters vary in time and space: they can grow and develop, as well as degrade, often (but not always) in sync with the life cycle of the dominant industry⁹⁶. This evolutionary process "... must be understood as an ongoing, never-ending interplay of path dependence, path creation and path destruction"⁹⁷.

Upward trend of the clusters evolution is usually associated with the development of networking and innovative behaviour when the industrial enterprises become part of clusters of innovation (COI) — the spatial clusters of organizations related in the innovation process — manufacturers, suppliers, service providers, universities, trade organizations and others⁹⁸. In the present conditions special significance of COI is determined, firstly, by the fact that in globalization business receives better opportunities to select the most suitable areas to apply its efforts. In this case, "The more markets globalise, the more likely it is that resources will flow to more attractive regions, reinforcing the role of clusters

⁸⁹ See: National Innovation Systems. — OECD, Committee for Scientific and Technological Policy, 1997. — P. 41.

⁹⁰ See: *ibid.*, pp. 41 — 42.

⁹¹ In the evolutionary economic theory routines are usually regarded as units of heredity at the level of organizations (see: Hodgson G. The mystery of the routine. The Darwinian destiny of an evolutionary theory of economic change / G. Hodgson // *Revue economique*. — 2003. — Vol. 54. — № 2. — P. 355 — 384).

⁹² Ukraine is a characteristic example in this respect (See: Vishnevsky V. Innovations, institutions and evolution / V. Vishnevsky, V. Dementiev // *Voprosy Ekonomiki*. — 2010. — № 9. — P. 41 — 62).

⁹³ See: Foster R. Innovation: The Attacker's Advantage / R. Foster. — London : Macmillan, 1986. — 316 pp.

⁹⁴ See: Giuliani E. Clusters, networks and economic development: an evolutionary economics perspective / E. Giuliani // *The Handbook of Evolutionary Economic Geography* / ed. by R. Boschma and R. Martin — Cheltenham, UK, Northampton, MA, USA: Edward Elgar Publishing, Inc., 2010. — P. 263.

⁹⁵ See: Malmberg A. An evolutionary approach to localized learning and spatial clustering / A. Malmberg, P. Maskell // *The Handbook of Evolutionary Economic Geography* / ed. by R. Boschma and R. Martin — Cheltenham, UK, Northampton, MA, USA : Edward Elgar Publishing, Inc., 2010. — P. 399.

⁹⁶ See: *ibidem*.

⁹⁷ See: Martin R. Path dependence and regional economic evolution / R. Martin, P. Sunley // *Papers in Evolutionary Geography*. — 2006. — № 06.06. — P. 11.

⁹⁸ See: Engel J. Global networks of clusters of innovation: Accelerating the innovation process / J. Engel, I. Del-Palacio // *Business Horizons*. — 2009. — Vol. 52. — № 5. — P. 493.

and driving regional specialisation”⁹⁹. These processes result in the fact that, for example, in Europe up to 40% of employees work at enterprises that are part of a cluster.¹⁰⁰ And, secondly, it is determined by the fact that the traditional linear model of innovation (as a sequential process of “fundamental research — applied research — R&D — new technologies and products”) is steadily losing its value. While the three-dimensional model of a “learning region”¹⁰¹ is becoming more topical, where innovation requires parallel development of learning abilities and the formation of a strategic innovative behaviour of diverse and complementary economic actors who benefit “... from the geographic proximity which facilitates the flows of tacit knowledge and the unplanned interactions that are critical parts of the innovation process”¹⁰². Public policy on industrial clusters, entering the trajectory of an upward trend, provides for measures “... to focus the often thematically scattered companies on particular points. These focal points generate first synergies within the cluster and enable it to enter the growth stage”¹⁰³.

The downward dynamics of clusters leads to the formation of territorial lock-ins, particularly in old industrial regions, where “... initial strengths based on geography and networks, such as industrial atmosphere, highly specialized infrastructure, close inter-firm relations and strong support by regional institutions, turned into barriers to innovation”¹⁰⁴. This situation can also be characterized as fitness failures, but already with an emphasis not on the national (as in the cases with NIS), but territorial aspects. An important reason for such old industrial regions’ lock-ins is organizational routines of self-supported regional coalitions of business and politics (self-sustaining coalition), in which representatives of

large companies prefer not to invest in business restructuring, because they fear to lose skilled workers, and representatives of authorities are not interested in such re-structuring, because they fear to lose tax revenue.¹⁰⁵ In order to avoid a continuation of adverse trends that lead to stagnation or decline, and switch to a different trajectory of development involved in the update, it is required to cultivate (taking into account the territorial context) organizational routines that shape the ability of these coalitions to activating innovation-oriented adaptation of old industrial clusters, creating new clusters in the entrenched industries and developing knowledge-intensive activities.¹⁰⁶ The effectiveness of such actions, again, does not boil to the current performance indicators, but requires using long-term growth indicators, for example, the criterion of balanced development proposed in the paper.¹⁰⁷

Conclusion

“Cambridge — British Prime Minister Gordon Brown promotes it as a vehicle for creating high-skill jobs. French President Nicolas Sarkozy talks about using it to keep industrial jobs in France. The World Bank’s chief economist, Justin Lin, openly supports it to speed up structural change in developing nations. McKinsey is advising governments on how to do it right. ... Industrial policy is back”.¹⁰⁸

This statement by D. Rodrik — Harvard University (USA) — shows a certain shift in relation to industrial policy, which, in turn, can be considered as part of a broader process of finding new approaches to social action and supporting their research programs that can better respond to the challenges of today. In this competition not only already well-recognized institutionalism, but also

⁹⁹ See: Innovation clusters in Europe — a statistical analysis and overview of current policy support. — DG Enterprise and Industry report, Europe INNOVA, 2007, Pro INNO Europe paper. — № 5. — P. 8.

¹⁰⁰ See: *ibid.*, p. 9.

¹⁰¹ See: Nauwelaers C. Path-dependency and the role of institutions in cluster policy generation / C. Nauwelaers // Cluster Policies — Cluster Development? / ed. by E. Mariussen. — Stockholm, Nordregio Report 2001. — № 2. — P. 94.

¹⁰² See: Innovation clusters in Europe — a statistical analysis and overview of current policy support. — DG Enterprise and Industry report, Europe INNOVA, 2006, Pro INNO Europe paper. — № 5. — P. 7.

¹⁰³ See: Menzel M.-P. Cluster life cycles — dimensions and rationales of cluster development / M.-P. Menzel, D. Fornahl. — Jena Economic Research Papers. — 2007. — № 76. — P. 36.

¹⁰⁴ See: Hassink R. Locked in decline? On the role of regional lock-ins in old industrial areas / R. Hassink // The Handbook of Evolutionary Economic Geography / ed. by R. Boschma and R. Martin — Cheltenham, UK, Northampton, MA, USA : Edward Elgar Publishing, Inc., 2010. — P. 450.

¹⁰⁵ See: Hassink R. Locked in decline? On the role of regional lock-ins in old industrial areas / R. Hassink // The Handbook of Evolutionary Economic Geography / ed. by R. Boschma and R. Martin — Cheltenham, UK, Northampton, MA, USA : Edward Elgar Publishing, Inc., 2010. — P. 452.

¹⁰⁶ See: Tripl M. How to turn the fate of old industrial areas: a comparison of cluster-based renewal processes in Styria and the Saarland / M. Tripl, A. Otto // Environment and Planning A, 2009. — Vol. 41. — № 5. — P. 1217 — 1233.

¹⁰⁷ See: Vishnevsky V. Scenarios of the old industrial regions’ development: selecting the methodology / V. Vishnevsky, I. Aleksandrov, A. Polovyan // Environment, Development and Sustainability, 2011. — Vol. 13. — № 1. — P. 65 — 78.

¹⁰⁸ See: Rodrik D. The return of industrial policy / D. Rodrik D. — Access mode : <http://www.project-syndicate.org/commentary/rodrik42/English>.

Industrial policy in the light of neoclassical, institutional and evolutionary economic theories

Economics	Characteristics				
	Economic agents' behaviour	Grounds for industrial policy	Restrictions on industrial policy	Objects of industrial policy	Criteria for the policy effectiveness
Neoclassical	Rational	Market failures	Government failures	Incomplete information, non-competitive markets, externalities	Comparison of costs and benefits
Institutional	Determined by institutes	Rules failures	Government failures	Innovation, sectoral diversification, global value chains	Comparison of costs and benefits, taking into account transaction costs
Evolutionary	Determined by the desire to transfer genes	Fitness failures	Government failures	National systems of innovation, industrial clusters	Comparison of development indicators

rapidly expanding its sphere of influence evolutionary economics are increasingly becoming the competitors of the traditional neoclassical theory.

The analysis showed that each of these theories offers a basis for industrial policy (see Table).

The relevance of these grounds is determined, firstly, by the underlying assumptions of theories, and secondly, by the circumstances of place and time.

Economic neoclassic is limited by the scope of economic agents' rational behaviour. It is easy to see that this type of behaviour has more chances to exist in developed countries with long-established rules and developed markets, and is less likely for the former Soviet socialist republics, including Ukraine. Institutional theory, emanating from the premises about the human behaviour guided by institutes, has a broader scope for application in Ukraine. Now there actually dominates the institute of mistrust¹⁰⁹ that, as a consequence, includes high transaction costs and distorted commodity prices. Therefore, the transition to confidential "long" rules of economic agents' interaction here is not just desirable, but necessary. The theory of evolution taking into consideration "selfish genes"¹¹⁰ independent of human will and focused on cultivating new institutes more adequate to local conditions, taking into account the historical and spatial features of the process of gene-culture co-evolution is no less important for Ukraine.

These facts suggest several conclusions.

1. Despite the negative Ukrainian past experience, industrial policy, apparently, still has a right to exist, because it received new grounds, determined by the specifics of processes of the world and national economies' evolution in the XXI century, including the development of innovative clusters, the formation of national innovation systems, the growing role of global value chains, etc.

2. Ukraine should move from the traditional selective support of individual industries to a matrix policy of the European type. It combines both vertical and horizontal innovation-oriented policies aimed at eliminating rules failures (institutional theory) and fitness failures (evolutionary theory) instead of eliminating market failures (neo-classical theory). Ukrainian "obsession" with the definition of priority industries is a harmful practice of "pick winners". This does not mean that the priorities are not necessary in principle, but it means that in this case they are not a major problem.

3. Grounds for industrial policy may be different, but they are always opposed to one and the same limitation — the government failures. In the context of industrial policy this is a key concept and the main problem. One can not count on getting positive results without minimizing the likelihood of government failures and their associated costs. This is evidenced by the world

¹⁰⁹ According to a survey conducted by the Institute of Sociology of NAS of Ukraine in the spring of 2011, almost half of the population (47.8%) think this period is the time of criminals and con men (See: <http://www.interfax.com.ua/rus/main/75672/>).

¹¹⁰ See: Dawkins R. The selfish gene / R. Dawkins. — Oxford, New York : Oxford University Press, 1976. — 224 p.

experience. For example, well-known successes of the industrial development in Japan and South Korea in the second half of the twentieth century (which many other countries were never able to replicate) "... are thanks to trustworthy and effective bureaucracy, no less than to industrial policy itself."¹¹¹

4. In connection with above-mentioned it is required to move from neo-classical collection of tools (taxes, subsidies, government procurement, etc.) used by the government to business as an object, to a broader range, including institutional and evolutionary tools — improvement of existing and cultivation of new, more effective institutes, based on interaction and cooperation between the government and business as equal subjects, and better adapted to the circumstances of Ukraine at this stage of its development. The key point of this interaction is reduction of the government failures likelihood by a procedural constraint of the range of actions available to it only to those for which a public consensus with the industry has been reached.¹¹²

In practice, all this is not easy to realize. So there is no hope for another Ukrainian "industrial miracle" in the near future. But the work must continue, and the main thing now is not to err in the guidelines of development and general principles of modern industrial policy.

Vyshnevsky V. P., Dementiev V. V. Industrial Policy for Ukraine: Theoretical Aspects

The paper studies the theoretical bases of an industrial policy from positions of the neoclassical, institutional and evolutionary economic theory. It is proved the expediency of transition in Ukraine to the European-type matrix policy which combines both vertical actions focused on selective support of sectors, and the horizontal actions focused on innovations and directed instead of

elimination of the markets failures on elimination of rules failures and fitness failures.

Key words: industrial policy, innovations, economy. Regions.

Вишневський В. П., Дементьєв В. В. Промислова політика для України: теоретичні аспекти

Розглянуто теоретичні підстави промислової політики з позицій неокласичної, інституціональної та еволюційної економічної теорії. Обґрунтовано доцільність переходу в Україні до матричної політики європейського типу, що поєднує і вертикальні, орієнтовані на селективну підтримку галузей, і горизонтальні, орієнтовані на інновації, дії, спрямовані замість усунення провалів ринків на усунення провалів правил і провалів пристосованості.

Ключові слова: промислова політика, інновації, економіка, регіони.

Вишневский В. Л., Дементьев В. В. Промышленная политика для Украины: теоретические аспекты

Рассмотрены теоретические основания промышленной политики с позиций неоклассической, институциональной и эволюционной экономической теории. Обоснована целесообразность перехода в Украине к матричной политике европейского типа, которая сочетает как вертикальные, ориентированные на селективную поддержку отраслей, так и горизонтальные, ориентированные на инновации, действия, направленные вместо устранения провалов рынков на устранение провалов правил и провалов приспособленности.

Ключевые слова: промышленная политика, инновации, экономика, регионы.

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¹¹¹ See: Buigues P.-A., Sekkat K. Industrial policy in Europe, Japan and the USA: Amounts, mechanisms and effectiveness. — Palgrave-McMillan, 2009, p. 82.

¹¹² Recommendations on the organization of such an interaction can be found in: Rodrik D. Industrial policy for the twenty-first century. — Centre for Economic Policy Research, 2004, CEPR Discussion Papers, № 4767. — 56 pp.