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Economic theory

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PROBLEMS OF INNOVATION IN THE LIGHT OF EVOLUTIONARY THEORY

The world financial crisis has vividly demonstrated acute problems in the innovative development of the former Soviet Republics (the USSR). The state with the innovation there is depressing, if you look at it from the standpoint of American and European leaders, and disastrous — when compared with the Asian Dragons (South Korea, Singapore, Hong Kong, Taiwan) and China (Table 1).

It cannot be stated that very few people understand the importance of innovative development. Just on the contrary: this idea is accepted by almost everybody — from presidents to ordinary citizens. There have been adopted the laws on innovation. The development of innovative policies and programs at the national and regional levels turned into a particular genre of standard-setting activities. There were held parliamentary hearings on the issue. However, neither Russia nor Ukraine, the two largest economies in the former Soviet Union[1], in spite of good starting points, are not currently and, apparently, will not become in the nearest future, the innovation leading countries.

The reason which is often mentioned in analytical documents of various kinds is the lack of financial resources for innovation, caused by the complex processes of market transformations. However, such explanation gives rise to doubt.

Indeed, despite certain differences in the policies of the former Soviet republics, their common economic characteristic is a very low level of expenditure for producing new goods, developing and introducing new technologies. Yet this does not mean that resources necessary for this are not available. For example, the business costs for innovation are comparable, if not yield, to expenditures for maintaining political parties, football clubs, bribes, etc.[2] This proves not a lack of funds, but a specific scale of local entrepreneurs' values. Investments in innovation are not their primary need, and technical and technological backwardness of the enterprises is not a critical issue. All of these can be sacrificed in favour of other, more important priorities.

The matter thus is not in the lack of money for innovation. At least the question could be put this way: why were not even the most abundant financial resources of pre-crisis "mast years" used efficiently, and was not money allocated for the production modernization and productivity increase? Why, do even those businesses which now have a high level of output liquidity and, consequently, good financial opportunities have no innovations or remain under-invested?

But before these questions can be answered, it is necessary to refer to the methodology of researching the issue.

Methodology

Innovation is usually understood as the introduction of new products, new technologies and other types of activities that promote knowledge transfers and adapt production processes. From the standpoint of the economic theory of the firm, innovation requires learning about how to transform technologies and access markets in ways that generate higher quality, lower cost products (Lazonic 2006, p. 30).

Mainstream economics — the neoclassical economic theory — considers innovation through the prism of the optimizing firm. But the optimizing firm cannot be innovative simply because the innovative firm transforms some of those technological capacities or opportunities and market prices that the optimizing firm takes as given (Lazonic, 2006, p. 31). Therefore the

[1] In the Russian Soviet Federative Socialist Republic and the Ukrainian Soviet Socialist Republic there were concentrated approximately 70% of the former Soviet Union population and almost 80% of all industrial fixed assets.

[2] For example, in the pre-crisis 2008, all enterprises of Ukraine spent about $240 million on research and development, while the total annual budget of only two of the leading Ukrainian football clubs — Shakhtar Donetsk and Dynamo Kiev — exceeded $ 140 million.

Table 1

Some Indicators of Innovative Activity in the World

Countries	Researchers in R&D	Technicians in R&D	Scientific and technical journal articles*	Expenditures for R&D		High-technology exports		Royalty and license fees	Patent applications filed		Trademark applications filed	
	per million people, 2000-2006	per million people, 2000-2006	thousand pcs, 2006	% of GDP, 2000-2006	$ millions, 2007	% of manufactured exports	$ millions, receipts	$ millions, payments	residents	non-residents	residents	non-residents
LMIC*	..	..	125.8	0.92	391 161	19	2 337	26 550	189 996	128 642	419 223	207 057
Russian Federation	*3 255*	*574*	*14.4*	*1.08*	*4 144*	*7*	*396*	*2 806*	*27 505*	*11 934*	*31 502*	*10 372*
Ukraine	..	..	*2.1*	*1.03*	*1 314*	*4*	*53*	*577*	*3 474*	*2 416*	*19 888*	*3 858*
China	926	..	41.6	1.42	336 988	30	343	8 192	153 060	92 101	669 276	56 840
HIC**	3 890	..	582.3	2.48	1 312 001	18	162 778	137 730	822 037	446 827	962 720	198 874
USA	4 651	..	205.3	2.61	228 655	28	82 614	25 047	241 347	214 807	256 429	33 065
Korea	4 162	583	16.4	3.23	110 633	33	1920	5 075	128 701	43 768	112 157	20 131
Singapore	5 713	549	3.6	2.39	105 549	46	716	9 905	696	9 255	5 383	11 170
Eurozone	2 767	1 237	158.1	2.01	440 779	14	27 601	54 216	81 901	21 591	312 991	21 892
Germany	3 386	1 144	44.1	2.52	155 922	14	7 249	9 698	47 853	13 139	72 788	3 377
France	3 353	1 746	30.3	2.12	80 465	19	8 827	4 603	14 722	2 387	70 432	3 151

* LMIC — low and middle income countries (according to the World Bank classification).
**HIC — high income countries (according to the World Bank classification).

Compiled according to: World Development Indicators 2009. — The World Bank: Development Data Group, 2009.

canonical economic theory does not give a satisfactory explanation to the phenomenon of innovative activity.

Further, if we take into account the circumstances of time and place, usually ignored by neoclassics, it is easy to notice that the skills base used by enterprises to transform technologies and to get access to the markets may significantly vary even within the same type of industrial activity in the same historical period, leading to various innovative results, so that innovations naturally occurring in the same institutional environment can just as naturally be absent in the other. Moreover, even in one and the same industry in one country the institutional environment that produces good results in a given period of time may get in the way of getting them in another period.

At the present time in Russia and Ukraine in almost all sectors there has formed such an economic order that rejects innovation. So the first task set in this article is, using the tools of institutional theory, to investigate (in the context of innovation) the features of this order, i.e. specificity of those structured interactions among people that were formed on the basis of institutes-rules (organizational routines) with their inherent mechanisms of coercion. In other words, this task is to analyse the situation in which economic actors operate "within the rules".

But in the long run, the institutions-rules themselves are not anything unchangeable, static (Hamilton 1970); they are also variable, inherited and selected in the sense that: (1) the source must be causally involved in the production of the copy; (2) the copy must possess the capacity to replicate and be like its source in other relevant respects; (3) the process that generates the copy must obtain the information that makes the copy similar to its source from that same source (Hodgson and Knudsen 2006, p. 484).

From the evolution theory standpoint, they represent one of the properties (factors) of fitness. One — because there may be other properties defining the ability of companies to survive under these time and place circumstances. Ultimately, those can survive who, other things being equal, acquire properties — choose the standards of conduct — that are relevant to external environment. This choice may be lucky or not.

In biological evolution by natural selection it is possible to inherit the properties that solve the local problem of individual genotypes transfer, but also interfere with the reproduction of species as a whole and lead to its extinction[3]. The same way the public life may follow unsuccessful rules that help solve local problems (for example, the survival of enterprises in the specific context of the ongoing redistribution of property), but do not create necessary prerequisites for solving more general problems (for example, their successful competition with the world's innovation leaders who operate under conditions of well-protected property rights).

The evolutionary methodology is appropriate here, because variability and population theory of natural selection by Charles Darwin can be considered as one version of a more general form of historical explanation, and the population mode of explanation can be applied not only to organic species, but to the historical objects as well (Toulmin 1972; Witt 2008). It is only important to take into account that it is used not to explain any changes in time, but only those when "... we are interested in how open, complex systems become adapted to their environments, how variety evolves from common origins, and how design accumulates over time, Darwinism specifies both the necessary and sufficient conditions to explain these phenomena." (Stoelhorst 2008, p. 358).

Our study is just the case, because:

open, complex systems — domestic enterprises — adapt to their environment;

variety of organizational routines arises from the general situation of initial anarchy of the post-socialist accumulation;

selected routines for enterprises accumulated over time and led to the formation of the current situation.

Hence the second task is to explore, using the tools of evolutionary theory, how the institutions-rules that prevent innovation have been formed, and on that basis to substantiate what it is necessary to set the further evolution of the rules on track needed for the innovative development of the economy.

The Institutional Model

In the market economy the goods are not produces unless they have effective demand. Since innovation at domestic enterprises "will not go" in the former Soviet Republics, it means that there is no effective demand for them on the part of a business, or at least this demand is suppressed.

Businesses' demand for innovations is a demand for them from the side of the dominant owners of assets. At the domestic enterprises they are presented, as a rule, by physical (not legal) persons. Since commonly the property has not been detached from the management yet, it is usual that the owners and/or affiliates are at the

[3] As noted by P. Samuelson: «Sexual selection … describes cases in which male birds evolve to have ever more elaborate tails, which may serve no functional use and indeed may degenerate into dysfunctional baggage; yet this odd process can even accelerate if females for whatever reason are preprogrammed to exercise mating choice toward ever-bigger tails». And further: «... there is something perverse and pathological about sexual selection, in which what makes for individual fitness in the sense of differential survivability of genotypes within the species can be definitely conducive to group unfitness. Those tails thus can grow indefinitely until they cause the species to be rare or go extinct» (Samuelson 1993, p. 144).

same time top managers (strategic controllers) of the enterprise[4]. This phenomenon has been called "the physical bodies' economy" (in the Russian-language literature) and "family and clan capitalism" (Roth 2005), which means the concentration of economic power at the enterprises in the hands of some individuals and their families, exercising supreme control over the commodity production and the distribution of incomes from its sales.

The owner of the assets in the post-Soviet countries, like many other economic subjects, seeks to maximize private utility (taking into account restrictions from the risks, acceptable standards of behaviour, etc.), or, in other words, the personal income. This is his causa finalis and, accordingly, the purpose of managing the company under his control. In relation to this objective everything else (innovations, new equipment and technology, productivity, profitability of production, its environmental characteristics, etc.) is of secondary character and is accepted only in so far as it contributes to the maximization of his personal income.

Personal income of the owner's assets is derived from the profit from the company controlled, remaining after paying taxes, other compulsory payments, dividends to minority shareholders, etc. Therefore, the initial point to explain the lack of demand for innovation from the assets owners is the analysis of the main sources of and ways to maximize the profit of enterprises and further — a personal income of the owner.

According to the canonical economic theory there is no economic profit on the markets dominated by perfect competition. Maximum the owner can count on is a so-called "normal profit of entrepreneur", which is a part of economic costs. The condition for getting economic benefit is the possession of some competitive advantage.

In the market economy, if we exclude the natural monopolies, arbitrage transactions, and fraud, there are two basic ways of creating competitive advantages for companies to obtain economic profit. Moreover, these ways are to a certain extent mutually exclusive and incompatible.

The first way is innovative. The company receives an economic benefit, as it forms special production capacities, ensuring lesser quantities of physical production costs (lower resource consumption) per a unit of output compared to other producers in the industry, or releasing the goods with such characteristics that competitors do not possess. This way is based on the creating technical, technological and organizational advantages by an entrepreneur over other producers. In this case, the source of profits that he receives is a temporary monopoly of the innovator.

An innovative way to create economic benefits is associated with the risk of investment in research and development, new equipment and technology, and involves relatively broad time horizons of economic planning, since such investments can usually provide returns only in the long run. Therefore, the basic condition for innovative development is the availability of stable, "long rules" ensuring that economic gains resulting from investments in knowledge, and further in new machinery and technology, will not be confiscated, stolen, withdrawn legally, etc., and business based on innovation, will not be taken away.

The second, currently predominant path is the rental maximization of the economic profit. Its essence is that a source of profit is an understatement, compared to the market of free competition, of prices per a unit of resources used, inflated prices for final products, refusal to bear the full burden of social costs (the understatement of tax and other payments from income), or the refusal to share the profits received with other claimants. In this case the owner assigns the rent, i.e. income that exceeds the contribution of the owner and his own production factors in the creation of the social product.

The condition of the rental, yet, in fact, the predatory way of making profit is the advantage of having access to resources of the economic power, making economic actors agree to those conditions that are dictated to them by the owner of assets (Takata 1995). This power can be based on the market monopoly, power of money, political, administrative, criminal power, etc. It is the availability of private economic power that is the main competitive advantage which allows receiving the rent and makes the coercion, necessary for this, possible.

The private economic power is the most valuable resource of domestic enterprises. Thanks to its availability the owner's assets gain the capacity to generate rental income. But not every business owner and the owner of not every business can receive such income. They are available only to that owner, who dominates inside the enterprise, and only to the company which may "impose" its own terms to the suppliers of resources and/or to the product consumers. That is, in order to make a profit, not enough to be the owner of the assets, one should possess the power.

Within these realities the development of engineering and technology, improvement of production engineering, etc. are not the main conditions for receiving a profit. Only minimal maintenance of its technical and economic level is necessary to create products that are in demand on the world or domestic markets. The main prerequisite for getting profit is power, while production, engineering and technologies are auxiliary (required but not sufficient) conditions.

So, the owner of the assets has to choose (whether

[4] For example, a study carried out by the Corporate Governance Rating Service Standard & Poor's in pre-crisis 2007 showed that the boards of directors at the 75 Russian largest public companies, meeting the formal criteria for independence (non-affiliated directors), occupy a total of 20% of the seats. See: Corporate Governance: Transparency And Disclosure By Russian Companies 2007: High Turnover In Top 10 // http://www.standardandpoors.com/ratingsdirect.

he realizes this or not): either innovative profit, or rent; or reduction of resource consumption per a unit of output, or imposing "correct" prices on suppliers and consumers; or investment in new products and methods for their production or investment in the system of economic power.

Choosing the owner of the assets as a rational individual is determined by the relative return on an investment unit in different ways of making profit. The lack of effective demand for innovations means that the current structure of costs and benefits of doing business is such that investments in alternative ways of making profit give greater returns than innovative. Here's why.

First of all, we should note the lack of reliable protection of property rights due to the deficit of effective public (legislative, executive and judicial) authorities, the government's inability to enforce contracts. In practice, this means the presence of arbitrary rules ("short rules") as a factor in economic life, availability of opportunities to share income and assets not in accordance with the contribution to social welfare, but in accordance with the power (monetary, political, administrative, criminal), which some peoples or group of persons possess.

On the basis of the arbitrary rules there is shaped the asymmetry of economic power, which means its surplus in some individuals and economic structures and its deficit in other people. This excess of power, allowing dictating prices and transactions conditions, can manifest itself as: the market power, based on the monopoly of the business entity, the corporate power, when some companies through participation in the property and otherwise take over other companies, the administrative power within businesses, dictating the terms and conditions of remuneration, the order and direction of the profits distribution, the government power of the law enforcement and judicial bodies used for private purposes; the physical force power of the legal security structures and criminality.

With this economic order, to make a profit the owner must either have the power himself, or be under the protection of the person who possesses such power, or, finally, buy the services of the authority. Competition for new technology and product quality — the basic condition for the innovative economy — is supplanted and replaced with competition for sources of power, resulting in its ever-increasing concentration.

The desire for power in these conditions is dictated not only by positive goals to increase personal income, but also by protective purposes. Without access to the resources of power under "short rules" conditions it is quite problematic to do business and even to keep it. Thus, to some extent, the owner of assets has no choice: to invest in power or not. Without such investments it becomes impossible to maintain his position as the owner, to receive income from the assets controlled, and, often, to exist securely.

Investments in power are investments in: the political system in the form of financing political parties' activity and promoting their representatives in the government structures, corruption to make profitable decisions, acquisition, takeover and seizure of enterprises that have influence on the costs and benefits of doing business; the establishment of new business structures whose purpose is not production, but release of the owner's income from the control; the staff capable either to exercise power or to serve the authority; the formation of ideological influence on the political and economic life and the ideological justification for the power claims; the creation of the system for private violence in the form of its own security structures and/or criminals.

The result of investment in power was the formation of a particular economic order (and on its base — political and social organisation) as a set of sustainable socio-economic relations and forms of doing business, by which the economic profit is created and then extracted and assigned to the asset owners. The key element, the supporting structure of such economic order is relationships of dominance and power that are formed in the economy.

In such institutional conditions investment in innovation faces several challenges.

The first problem is the narrow time horizons of economic planning and short-term interests — what we have called the "short rules". In the world of private power domination no one, neither at the individual level nor at the firm level, is protected against arbitrariness, against the situation when his incomes, property, position at the enterprise, and finally, personal freedom, will be lost. The famous phrase by J.M. Keynes that in the long run we are all dead sounds especially topical in these conditions. From this follows the dominance of short-term interests and "investment myopia". In the short run, while the rules remain unchanged, profit or personal income can be securely received only by being embedded into a power system, but not through investment in innovation.

The second problem is the availability of alternative sources of income and, consequently, low costs in the form of missed profits from investments in innovation. It makes no sense to invest in research and development, design and implementation of new technology, creating new products and bearing the associated risks, when the same amount of income can be received by an alternative way. Moreover, technical and technological backwardness is not an existential threat to the domestic business. So far it is much more afraid of the prosecutor than of its own technical and technological backwardness or low competitiveness of output.

The third problem is the high transaction costs of innovation. They are associated with the fact that the organizational structure of the business controlled by the owner is focused on performing special tasks — establishing economic power, concealing the property rights and income, — and is poorly adapted to the

innovation processes. There is no organizational structure of managing the process of innovation promotion and innovation management in the domestic business. This structure is dominated not by the long-term production development needs, but by the short-term financial interests. Production management is detached from financial flows management and occupies a subordinate position. It is difficult to find such large private companies, where the right hand of the owner is not a director of finance, but a production director or a chief engineer. Any promotion of investment through those networks, within which the modern business operates, simply drowns in the abundance of organizational problems and related costs.

The fourth problem is the staff resistance. The current economic system makes the demand for such personnel, the key feature of whom is either the ability to exercise power and subjugate the people, or the ability to maintain power and ability to serve to those in power, and often, both abilities together. The rent-oriented behaviour model, based on the private power, is reproduced at all levels of governance: from top managers to workers. And the value of individual income is determined not by a contribution to the added value creation, not by the labour cost, no by qualifications, but, above all, by the place occupied in the managerial hierarchy of companies. Just as in the economy as a whole, the system of income distribution within the business structures depends not on the ability to generate new technical and technological solutions, but on the place in the power hierarchy and the proximity to its centres. In addition, there exists a banal resistance to the innovators on a personal level, because they represent a threat to the existing distribution of jobs and income in the corporation. In the existing situation in the personnel scheme there are no people able to generate and promote technical innovation; they are rejected by the system.

The fifth problem is the lack of scientific infrastructure for innovation. Effective functioning of innovation systems assumes interaction among businesses and research institutes and universities, availability of the skilled and mobile personnel, able to perceive and transmit new knowledge and skills (National Innovation Systems 1997). However, deriving the rent by understating the costs of education and scientific research (on which it seemed painless to save) resulted in the lack of investment required for the reproduction of scientific research and training scientific and technical personnel. In the end, there remains no one to generate innovation and implement them "in metal". Business proved to be not ready to bear the costs necessary for the maintenance and development of innovation infrastructure.

Thus, the first principle of the existing economic order determines how a profit is received. This is ensured by the private economic power (based on the monetary, political, administrative, criminal power), which under conditions of "short rules" brings more income than innovations. Let us now consider how this profit is assigned to the owner of the business and becomes his personal income, and how it affects the economic order.

Here comes into force the second principle of the current economic order — secrecy. All domestic business in the former Soviet republics is a great and "terrible commercial secret". The entrepreneur can safely declare that his business is based on innovation, new products and technologies. But he will not declare the fact that the basis for getting profit is the power and understatement of others' income, and, moreover, he will not show the real levers of power and personal income it allows capturing (as the French philosopher M . Foucault once remarked on this occasion, power is of clear and undisguised nature only in prison and in a mental asylum). For the same reason, in order to survive and earn income in the world of clan capitalism it is necessary to possess two essential qualities: power and secrecy. For the more overt are the rights of property and income, the easier it is to take them away, the more vulnerable they are.

As it has been already mentioned, the personal income of the owner, as the absolute aim of his business, is formed from the profit remaining after its distribution. The challenge is, therefore, not only in inflating prices and minimizing production costs, but also in minimizing the required payments from company profits to the state and minority shareholders (only in Ukraine there are about 18 million such people). The best way to minimize the payment from profits, and thereby maximize revenue for the owner is to withdraw profits from the controlled enterprise and, further, to hide the person who assigns it.

The most advantageous form of maximizing the dominant owner's individual income is not withdrawing them directly from the profit of a controlled manufacturing enterprise, but from the income of intermediary firms, which hold major trade and financial flows. It occurs according to a well-known scheme: the company products are sold to such firms at lower (insider) prices and they are subsequently resold (often repeatedly) and the income is settled on the accounts of intermediaries.

This explains the paradox that, when the economy based on private property, a huge number of enterprises (in Russia — about 30% of their overall quantity, in Ukraine — about 40%) remain unprofitable for a long time and none abandons them. The matter is that the company's official (reported) profit is not necessary to the assets' owner; moreover, it prevents him from maximizing his utility. Or he gets his personal income, concealing the actually created profit and "pumping" it in any way in his pockets, or if the company profits is withdrawn by embedding it in a vertical hierarchy of commercial structures, the owner assigns the income (the income is shared with him) of controlled by these entities of financial flows.

As a result of investment in strengthening the economic power and concealing the mechanisms of gaining income there arises such an economic order that rejects the innovation. Even if the owner wants to invest in it, he will face a number of obstacles, which are generated by the economic order created by him. This order is associated high cost of innovative activity, which has the effect of rejection of innovations by domestic businesses and explains the lack of effective demand from enterprises.

Thus, we emphasize again that the main obstacle to innovative activity is not shortage of funds or lack of attention to the state regulation of innovation processes. The stumbling block for innovation is economic and political institutes of the society, the asymmetry of economic power and the economic order growing on its basis. What is the condition of the rental path to profit gaining — the private economic power — is simultaneously a major obstacle to innovation development. The benefits of private economic power for the rental way of maximizing the income are the cost for the path of innovation. Therefore the problem of changing the businesses' attitudes to innovation is primarily the problem of changing the existing economic order and its institutes.

The Evolutionary Model

The current economic order has developed gradually. It grew out of the anarchy of the early years of market transformations, "the war of all against all" (according to Hobbes), when a planned socialist economic system had been already broken, and no one really knew how to build a new system of the market economy. The destruction of the old official ideology, which gave priority to public interests over the private and group ones and denied the exploitation of a man by a man, led to the rapid and widespread dissemination of opportunistic behaviour and to prevalence of personal selfish interests.

If in the planned economy the high implementation standard was the priority, now the economic initiative popped in the first place. This process was attended by the creation of the corresponding new forms of social interaction, structuring the relationship among the participants of the economic process, and the dying out of the former forms.

During the transition from the planned to market-based coordination mechanism in the Russian Federation and Ukraine there have been adopted decisions on price liberalization, privatization of the state property and elimination of state monopoly on foreign trade.

However, instead of the expected formation of a class of effective private owners, operating on the basis of stable market rules in the environment of free competition and are able to meet consumer demand and to ensure overall growth of the economy, such actions have resulted in rent-oriented owners-oligarchs (family clans), driven by the "short rules", and in unprecedented for the peacetime economic collapse conditioned by their actions. One of the mechanisms that ensured such transformations has been transfer pricing due to price differences in time and space.

First, prices released in the earlier formed monetary "overhang" led to hyperinflation — the rapid growth of prices over time. Persons with the authority to conclude contracts on behalf of companies have been able to use the material and financial resources at their disposal for personal gain, in effect, to privatize them by establishing double (transfer) prices: current prices — to conclude formal contracts, and actual prices (including inflation for the period of the contract) — for the informal, shadow contracts.

Secondly, elimination of the state monopoly on foreign trade has made available to decision makers the income from the difference in commodity prices in the space — on the domestic and external markets. Products that had the largest price gaps and were in demand on the foreign markets were above all cheap in the planned economy of the former USSR energy resources, raw materials and construction materials. Revenues from the difference in prices for these commodities were appropriated by setting double (transfer) prices: for the domestic market — to clinch formal contracts, and for foreign markets (taking into account the price difference in space) — for non-official, shady contracts.

Understatement of income from the implementation of formal contracts was used by top managers to make payments to suppliers of material resources, employees and the government, while unaccounted difference between official and real incomes — for personal enrichment, and investments in property privatization, development of the infrastructure of intermediaries who organize the shadow profits withdrawal, and protective investments in power. Such a redistribution of income, in effect, meant the appropriation of unpaid labour in the huge dimensions, which resulted, on the one hand, in the impoverishment of the working masses, as well as (due to shortage of taxes) of budget and retirees, and, on the other hand — in the rapid enrichment of top managers, the concentration in their hands of property and income from its use.

A right to sign contracts in the planned economy originally belonged to the people occupying an appropriate place in the management hierarchy established in the planned economy (senior managers). Under the conditions when the mass privatization began, it was necessary to confirm this right again. To do this, there was used insider information, informal connections and shadow incomes, invested in the property rights acquisition. Then logically it was necessary to consolidate them through defensive investments in power, because in such circumstances only "might makes rights"(Umbeck 1981).

The opportunity to extract revenue from the transfer pricing was for the new owners similar to acquiring control over the gold-bearing lodes: without any special concern about the production development, investments in new technological solutions, etc., it was possible to receive the rate of return unattainable for innovation. Therefore, the history of voucher privatization is so reminiscent of the gold rush in California (the USA) in the XIX century. Then, in the initial conditions of anarchy the masses of people tried to "stake out a claim" to obtain ownership of the previously abandoned wealth and, starting the production, to get rich quickly, but the real benefits from this were derived by those who have found effective ways of exploitation of the gold miners' labour.

During the period of mass privatization the people also tried a variety of behaviours that they believed could provide them with equal participation in the former common state property, but ultimately, by the end of this period, there have been selected and inherited the patterns of egoistic behaviour of insider-managers acting through the appropriation of unpaid labour of others. Expressed in terms of the dichotomy "innovative-conservative", the innovators of the rent-oriented way of gaining profit won (economically).

However, it was a Pyrrhic victory, reminiscent of the dead-end branch of gender selection in biology, where the increased individual adaptability leads to the degradation of the species.

First, the selected model of the planned economy transformation resulted in the predominance of enterprises specializing in manufacturing products of low degree processing, which enjoyed steady demand in the foreign markets, while the world's dominating innovative companies manufacture high-tech products of high degree processing.

Secondly, the privatized enterprises that fell under control of the dominant new owners are their personal "klondikes", but created not by nature, but by unpaid people's labour, and therefore necessarily based on the opposition of the owner and employees, while successful, innovative enterprises are always creative teams of the people working together, not of individual actors: "The innovation process is collective, as the transformation of technological and market environment requires integration of the large numbers of people with specialized knowledge and skills. So these people are involved in cooperative relationship for developing and using productive resources" (Lazonic 2006, p. 23).

Third, the evolutionarily stable strategy[5], growing out of the primary chaos of the selfish individuals' fight for the initially abandoned wealth is a strategy that involves investing in aggression (taking action to seize somebody's property) (Wärneryd 1993). In these circumstances the property remains potentially insecure, because there is always a danger that the more successful actions of the aggressive competitor would lead to its loss (a typical example is measures for large-scale revision of privatization that followed the victory of the Orange Revolution in Ukraine in 2004). This, along with price uncertainty, and other specific risks of the transitional economy, creates those "short rules", which were discussed above in the institutional model, which reproduce the high risks of the property rights infringement, while innovation requires long rules and cooperation, rather than only rivalry, of the economic actors (what was called "co-opetition" (Brandenburger and Nalebuff 1996)). In contemporary 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" (Malerba 2007, p. 677) and, for example, in such innovative areas of business as pharmaceuticals and biotechnology cooperation of large, small and new firms is pervasive (Malerba 2007, p. 685).

The root of all these problems is selfish behaviour of the dominant owners in the transition to the market economy and the associated ineffectiveness of anarchy[6]. It is a well-known fact that if individuals make independent selfish decisions, social optimum is usually not achieved and the resulting equilibrium in dominant strategies (where the choice of one individual does not depend on the decisions of another) is not Pareto-optimal. In other words, the "invisible hand" of Adam Smith in such circumstances does not work.

The last statement does not contradict the presumption that the competition of economic entities, acting in their own interests, may help increase their own and the general welfare. The matter is that the people's own interests are not necessarily selfish.

This thesis requires a special explanation.

Economists have long noted that individuals often extend the scope of their own interests to the objects that are outside themselves and their families, giving time and money to what is usually characterized as public goods (national defence, donation, charity, etc.). There is nothing unusual, strange in this. On the contrary, "... theory and data now being advanced are more compatible with the view that true altruism —acting with the goal of benefitting another — does exist and is a part of human nature" (Piliavin and Charng 1990).

The economic theory of rational choice explains

[5] A strategy is considered stable if in a population where everyone except a very small minority of mutants play it, its expected payoff is greater than that of the mutants strategy (Wärneryd 1993, p. 12).

[6] In the game theory there is known a so-called "price of anarchy", which determines the loss of efficiency as the ratio of socially optimal welfare to the welfare of the Nash equilibrium when players act selfishly (Roughgarden 2005).

altruism in terms of diversity of the human behaviour motives. For example, according to G. Margolis, inside a person there seem to exist two individuals: S-Smith (from "self-interest") and G-Smith (from "group interest") (Margolis 1981). For such a "society", consisting of two people, there can be developed the rules of rational distribution of resources, adherence to which can explain the people's observed behaviour (for example, their participation in voting, inexplicable from the standpoint of the usual comparison of benefits with costs) (Margolis 1981, p. 267).

H. Simon explains altruism in terms of bounded rationality and susceptibility to learning (docility[7]): "At the social level, the gradual change and selection of culture traits are producing patterns of information, advice, and resulting behavior that enhance the average fitness of members of the society; and because of docility, social evolution often induces altruistic behavior in individuals that has net advantage for average fitness in the society" (Simon 1993, p. 157). In the modern society, altruism often takes the form of loyalty towards the organization or organizational identification — "... a powerful altruistic force conditioning both participants' goals and the cognitive models they form of their situations. Appropriate attention to altruism, especially organizational identification, substantially changes the theory of the firm and, consequently, theories of the economy" (Simon 1993, p. 160).

This aspect is perceived by the modern theory of the innovative firm, which pays special attention to the organizational integration — the set of relationships that create incentives for people to apply their skills and efforts to achieve organizational goals (Lazonic, 2006, p. 34). We mean not banal cash bonuses, but developing new forms of labour cooperation related to the broader foundations of the social organization — the desire to develop internal corporate spirit and corporate loyalty[8].

Organizational identification is not limited to the corporate level, and can manifest itself as a phenomenon of a higher level of community, which is necessary for the formation of regional and national innovation systems — a set of interrelated institutes that determine the capabilities to create, save and share the relevant knowledge, skills and artefacts. Specialists in the field indicate that the development of such innovative systems requires a special mode of actions, which stresses the role of joint research and other technical collaboration among enterprises and public sector institutions, emphasizes the high level of co-patenting, co-publications and personnel mobility, the implementation of intellectual property rights, labour market policy and exchange programmes that promote such collaboration"(National Innovation Systems 1997).

Thus the economic order conducive to innovation is the order providing not only competition, but also collaboration of economic agents, which together generate, select and inherit the "long rules" of interactions, while its foundation is the organizational identification of various community levels based on the manifestations of altruism.

The current economic order unfavourable to innovation is the order, rejecting the cooperation of economic agents, which themselves generate, select and inherit the "short rules" of interaction, and its basis is the family-clan private economic power, based on the manifestations of egoism.

The Areas of Transition to Innovative Development

The main condition for the transition to an innovative way of development is the transformation of the existing economic order through coercion of the dominant owners (strategic controllers) of enterprises to show the instinct of mutual assistance in economic activity, creating such conditions that give chances of survival to the economic agents' behaviour, based on the "long rules" interactions. To do this, first of all, It is necessary to alter their socio-economic environment and/or move their activity within the framework of other — innovative — "populations of organizations"[9].

[7] "Docility" by Simon is "… the tendency to depend on suggestions, recommendations, persuasion, and information obtained through social channels as a major basis for choice" (Simon 1993, p. 156).

[8] A typical example in this respect are the East Asian traditions of governance, where the corporate officials regard themselves as the members of one big family and associate with it more than just the execution of routine duties. In its time the success of these models made the U.S. and European countries reconsider their approaches to corporate governance, so that there appeared even the special phenomenon, named Japanization/Toyotaism of management (Wood 1991).

[9] In the context of the problems studied it is important to understand why altruism survives in the nature. If you follow the logic of natural selection, within each population of individuals the altruists' genes should be replace by the egoists' genes: as selfish people benefit from altruistic behaviour of others, they are more likely to leave offspring. Nevertheless, altruism and cooperation continue to exist and develop.

The solution to this puzzle was offered by a theory of multilevel selection. Its basic idea is that the frequency of altruists in a structured population is determined by two factors: individual selection within subpopulations (groups), unfavourable for the altruists-cooperators, and group selection that is conducive to cooperative subpopulations. In other words: "Selfishness beats altruism within groups. Altruistic groups beat selfish groups" (Wilson and Wilson 2007, p. 345).

Transferring the idea of multilevel selection in the sphere of economic life, "selfish enterprises", operating within groups rejecting cooperation, can be compelled to change the mode of actions, activating the rivalry of these groups with subpopulations of economic entities that are engaged in cooperative behaviour (to increase the influence of the group selection factor) or converting these enterprises into cooperative subpopulation (to teach by imitation).

This problem can be solved by the government incentives of the domestic companies' exit on the foreign commodity and financial markets (by means of foreign exchange regulations, customs and tax policy, etc.), where there are other, more innovation-friendly rules than at home. The accumulated experience shows that their increased participation in international trade has a positive innovation effect. Empirical studies based on the data of business activities in several economies in transition showed that "... policy measures that facilitate foreign direct investment and international trade enhance domestic welfare through greater innovative activities of domestic firms" (Gorodnichenko, Svejnar and Terrell 2009, p. 29), and the best innovative results are demonstrated by the private exporting firms having access to external funding (Ayyagari, Demirgüç-Kunt and Maksimovic 2007, p. 26)

Even a simple implementation of the requirements of foreign exchange trade regulators contributes to the growing transparency of domestic companies, forcing them to dispose of non-core assets, improve the structure of capital ownership, develop new models of corporate governance. As evaluated by Standard & Poor's, basing on the data of 90 largest Russian public companies' activity, the average transparency index for the Russian domestically operating businesses is 1.3-1.5 times lower than the index of those listed in London and New York (Transparency and Disclosure by Russian Companies 2009).

It is obvious, however, that for objective reasons not all domestic enterprises can operate in the foreign markets. Hence altering the prevailing economic order within the country is also of utmost importance for innovation.

Partially this problem has been solved by the very course of the economic development.

First, the potential for gaining profit from the differences in commodity prices over time and space has been exhausted to a large extent: inflation is measured by one-digit numbers, the price gaps between domestic and export markets have narrowed significantly, while seemingly safe raw materials business in the context of the global financial crisis demonstrated its high volatility and vulnerability. There can be observed a situation of exhaustion of opportunities to get profit by means of the former products and activities — a situation that marks the advent of the phase of the crisis, restructuring and economic turbulence (Arrighi 1994, p. 235).

Secondly, long-term artificial lowering of prices for production factors to extract rent results in violating the conditions of reproducing resources required for the normal business activities. The consequence of low wages is the lack of skilled labour force and engineers; the consequence of lower tariffs for transportation is a crisis of rail freight transportation system etc.

Third, science and technology in the world do not stand still. On the one hand, reduction of the physical costs of production as a result of using innovative technologies outstrips the possibility of domestic enterprises to retain the depressed prices for resources. On the other hand, the introduction of new equipment and technologies leads to creating products with such characteristics that the domestic economy is no longer able to produce. As a result, there is observed a gradual decline in the quality of the domestic products "niche" and the threat of its displacement from the global markets in general is becoming increasingly real.

The desire to survive in such conditions pushes the owners of enterprises in the innovative way of development. It is important to support them in this in time with the help of economic incentives and other measures (taxes, credits, new technical regulations and standards, etc.). For example, in the field of taxation it may be the redistribution of tax burden from mobile factors of production (capital and labour) to resource and environmental charges.

Yet this is not enough. It is necessary to learn to form "long rules" for interactions, overcoming family and clan selfishness and "investment myopia". This can be done by means of indicative planning (national, regional, local) with built-in incentive to achieving development targets. Such planning proceeding from the notion of a fundamental divergence between short-term business aspirations and long-term investment interests of the society, between individual and collective rationality, can reduce uncertainty in the economic life. But in this case it is important not only the visible end result — the long-term objectives of economic development, reducing risks for businesses — but also the communicative process of joint decision-making, improving the institutional environment, generating organizational identification at different levels of community and building trust between counterparties through a permanent open interaction of the government, business and trade unions[10].

In poorly developed democratic institutions, when the state has considerable political and administrative impact on the economy, it also acts as one of the main factors of uncertainty that the business is trying to take control. Therefore, in the current realities the transition to innovative development requires not forceful

[10] The social aspect of joint development of public decisions is developed by the theory of communicative/collaborative planning, which is characterized as "... respectful, interpersonal discursive practice that is tailored to the needs of liberal and pluralistic societies, where one social group can not legally impose its preferred decisions on collective problems of other groups" (21, Sager 2009, p. 3).

separation of business from the government (more corrupt, and therefore more dangerous, than in developed countries), which is contrary to its natural desire to reduce the risks of economic activity and fraught with weakening the market position with further hostile takeovers by aggressive competitors, and the organization of participation in the cooperative development of ways for economic development through the mediation of authorities and cooperation of competitors ("co-opetition"), involvement in decision-making processes a wide range of stakeholders, forming an atmosphere of "synergistic partnership" (Brand and Gaffikin 2007, p. 283).

In these conditions the technostructure of the government (politicians, bureaucrats in the centre and locally) may be used to organize such cooperation and create conditions conducive to innovation-based growth. The economic crisis of the recent years has led to a reduction in posts, savings on the salaries of officials (or, at least to the need to declare such reduction and savings), reduced rent payments from the impoverished companies. The logic of maintaining and increasing bureaucratic advantages demands expanding economic activities of the enterprise-country ("Russia-corporation", "Ukraine-corporation") at the expense of restoring the economic growth, which, as the events of the recent years have proven, may not be sustainable if they are not innovative by themselves. And such actions from the part of the state technostructure have already been observed[11].

In this regard, it should be noted that the situation with a strong political and administrative influence of the state on the economy takes place not only in the former Soviet republics. An example is the Republic of Korea, where quite recently "... the military government was the main source for uncertainty in the environment, which should be brought under control" (Oh and Varcin 2002, p. 717). To reduce this uncertainty, the South Korean chaebols — business conglomerates owned by individual families — find it expedient to increase the economic power through diversification, thereby strengthening their bargaining position with the state. Here is how the logic of such actions has been explained by the chairman of Sunkyung Group Board of directors (interview, 1995), "When your business is small, the bureaucrats of all types and levels want to visit you and extort onerous payments. These thieves are the district police chiefs, district fire-fighting authorities, district tax administration, heads of regional utility services, etc. But if you take over two or three subsidiary companies, then these low-level gangsters are replaced by the police chief of Seoul, the head of the Tax Administration of Seoul, etc. And when you get ten more, you already deal with the heads of departments in government ministries. Finally, if you become as big as we are, the Chairman of the Board of Directors passes all the intermediate bosses and negotiates directly with the real boss — the President" (Oh and Varcin 2002, p. 717).

After the financial crisis in 1997 the South Korean government has taken steps to democratize the system of the "state-chaebol" through financial liberalization, involving social organizations in the regulation and raising social capital. Nevertheless, the government's influence on the economy remains strong. Moreover, the course that is being implemented here does not imply its weakening in the spirit of neo-liberalism, but on the contrary, it is considered that "The rich social capital ... will allow creating a strong government and strong market" (Lee 2005, p. 301). This indicates that in the conditions of a developed organizational identification[12] a strong political and administrative control over the economy of the state, which is sometimes even called "mafia" is not a stumbling block for developing the national innovation system — for many years now South Korea has been and remains one of the world innovative leaders.

At the regional level to form a new economic order based on organizational identification it can be important to create innovative clusters — regional groupings of independent businesses in one or more sectors of the economy — innovative start-ups, small, medium and large enterprises, as well as research organizations promoting innovation through intensive interaction, sharing facilities, exchanging knowledge and experiences (The Concept of Clusters and Cluster Policies 2008, p. 5). As noted by the European experts, such clusters "... are a form of "self-organisation" that offers competitive advantages. Clusters facilitate both intense competition and close cooperation, sometimes described as "co-opetiton". Geographical proximity is believed to facilitate the flows of tacit knowledge and the unplanned interactions that are critical parts of the

[11] An example is the Russian Federation Government's decision to establish the Russian equivalent of the Silicon Valley — the technopolis in the village Skolkovo, Moscow region — the construction of which, characteristically, was to be headed not by an official, but a businessman — the head of Renova Group, Victor Vekselberg (http://finance.rambler.ru/news/economics/ 66030826.html).

[12] The level of citizens' loyalty to the "Korea-corporation" was demonstrated by the events of the financial crisis in 1997. Then South Korean government appealed to the people to donate their treasures to the needs of the national economy. In response millions of people from various walks of life lined up in long queues to gold purchase points in order to turn in their jewellery. In a short time they managed to collect 270 tons of gold, which strengthened the state reserves, helped banks and other financial structures to survive tough times. See: Economic Crisis and People's Responses: S. Korean case. — http://www.boostworks.com/?p=200.

innovation process" (The Concept of Clusters and Cluster Policies 2008, p. 8). The stability of such flows, in turn, depends on the degree of trust among economic actors, their willingness to inform others about their knowledge and skills.

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Nearly 140 years ago Charles Darwin wrote, "It must not be forgotten that although a high standard of morality gives but a light or no advantage to each individual man and his children over the other men of the same tribe . . . an increase in the number of well-endowed men and an advancement in the standard of morality will certainly give an immense advantage to one tribe over another" (Darwin 1871, p. 166). Now the standard of morality common for the former Soviet republics, based on making selfish interests absolute, have led to the formation of the economic order, conducive to the private family-clan economic power, but destructive to innovation.

Socio-biological aspects of the individual's selfishness in relation to the current regime of the physical entities' property rights have become the problems for enterprises and the society.

The periods of economic reforms are accompanied by social mutations of the institutes-rules that guide the behaviour of economic agents in a certain direction. As evidenced by the results of natural experiments in Russia and Ukraine — the shock transformation of the economy, when in a short period of time there was totally destroyed the old economic order — here such social mutations resulted in the victory of the institutions-rules, inefficient in regard to innovation. It also emerged that a direct analogy between replicators in biology (genes) and economy (institutions-rules, or organizational routines) does not work. Economic replicators, unlike biological ones, appeared to be more fragile and easily destructible.

The economic institutions-rules are epigenetic in nature and, like any cultural-behavioural superstructure, are based on a biological basis — in the sense that they are formed by living beings who are carriers of genetic information and who are guided by instincts — innate responses to external and /or internal stimuli. In this basis there are represented both selfish, and altruistic genotypes (Nedelcu and Michod 2006). Therefore, in principle, it provides the potential opportunity to form the high types of cultural and behavioural add-ons that promote organizational identification and competitors' cooperation (social reciprocity, reciprocal altruism (Alexander 1990)). These types are based on altruistic behaviour, which in the human society is transmitted not only genetically, but through copying, through imitation, memes (Blackmore 2000).

But this is only a potential opportunity, and nothing more. First, the biological basis is the ground for the low (selfish) the types of cultural and behavioural superstructures to naturally occur (low levels of organizational routines), encouraging the uncompromising rivalry and competition. As for the higher (altruistic) types, they should be cultivated purposefully, long and hard.

The consequence of the economic order established in the former Soviet Republics is their innovation gap with the developed countries. In order to bridge this gap it is necessary to create such cultural and behavioural add-ons and the conditions for disseminating such high moral standards that will be paying tribute to the economic agents' setting not only for the rivalry and competition, but for cooperation and mutual assistance. These actions will result in restricting private economic power and establishing the new economic order, based on organizational identification and the "long rules" of economic actors' interaction.

The time will tell whether all this will become possible.

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Vishnevsky V. P., Dementiev V. V. Problems of innovation in the light of evolutionary theory

The article examines the features of the economic order that has been established in the former Soviet republics and impedes their innovative development. It is shown that this order, based on the family and clan private economic power, rejects the cooperation of economic actors that produce, select and inherit the "short rules" of interaction. It is proved that, in order to change it, it is necessary to create conditions for restricting the private economic power through co-opetition, the formation of organizational identification and "long rules" of interaction among the economic actors.

Keywords: innovations, institutes, evolutional theory, economic order.

Вишневський В. П., Дементьев В. В. Проблеми інновацій в світлі еволюційної теорії

У статті досліджено особливості господарського порядку, що склався в республіках колишнього СРСР і перешкоджає їх інноваційному розвитку. Показано, що цей порядок, заснований на сімейно-клановій приватній економічній владі, відторгає співпрацю економічних суб'єктів, що виробляють, відбирають і наслідують "короткі правила" взаємодії. Обґрунтовано, що для його зміни потрібно створити умови для обмеження приватної економічної влади за допомогою співпраці конкурентів, формування організаційної ідентифікації і "довгих правил" взаємодії економічних суб'єктів.

Ключові слова: інновації, інститути, еволюційна теорія, господарський порядок.

Вишневский В. П., Дементьев В. В. Проблемы инноваций в свете эволюционной теории

В статье исследованы особенности хозяйственного порядка, который сложился в республиках бывшего СССР и препятствует их инновационному развитию. Показано, что этот порядок, основанный на семейно-клановой частной экономической власти, отторгает сотрудничество экономических субъектов, которые вырабатывают, отбирают и наследуют "короткие правила" взаимодействия. Обосновано, что для его изменения требуется создать условия для ограничения частной экономической власти посредством сотрудничества конкурентов, формирования организационной идентификации и "длинных правил" взаимодействия экономических субъектов.

Ключевые слова: инновации, институты, эволюционная теория, хозяйственный порядок.

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