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## **AZ UKRÁN GAZDASÁG VÁLLALATIZÁLÁSA ÉS TECHNOLÓGIAI MODERNIZÁCIÓJA**

*Ukrajnában folytatódik a vállalati szervezetek fejlődésének folyamata - beleértve a tudásintenzív vállalatokat is - a gazdasági átalakulások mellett. A legfelső száz tudás- és technológia-intenzív vállalat közül sokat már évekkel ezelőtt megalapítottak: köztük a „Motor Sich”, a Novokramators’k Gépgyár, a „Styrol”, az Antonov Légijármű Tervező Iroda és Gyár már sikeresen működnek évek óta mind a hazai, mind a külföldi piacokon. Bár az ukrán gazdaság főbb problémáinak megoldásában nagy szerepet játszanak, egyelőre még nem elegendő hatékonysággal. Ezért Ukrajnának komoly problémákkal kell szembenéznie, hogy gazdaságának vállalati szegmensének innovatív korszerűsítését és gyorsulását gazdasági növekedés révén fokozzák, mivel a vállalati forma a legfejlettebb üzleti szervezet.*

### **CORPORATIZATION AND TECHNOLOGICAL MODERNIZATION OF THE ECONOMY OF UKRAINE<sup>1</sup>**

#### **1. CORPORATE ENTITIES IN UKRAINE AND THEIR PUBLIC FUNDING SUPPORT**

A process of formation of corporate entities, including those knowledge-intensive, continues in Ukraine along with economic transformations. Among the top one hundred knowledge- and technology-intensive companies many were founded long time ago: “Motor Sich”, Novokramators’k Machine Works, Concern “Styrol”, Antonov Aircraft Design Bureau and Factory, and others successfully operating in both domestic and foreign markets. Albeit their role in tackling key problems of Ukraine’s economy is clearly insufficient. Ukraine therefore faces now a complicated problem of enhancing corporate segment of its economy on the path of its innovative modernization and acceleration through it of economic growth, because the corporation is the most developed business organization.

As is known, quickly growing companies play a particular role in technological modernization of national economy. According to the existing classification, these are the companies that enjoy the revenue growth of not less than 20% for not less than five years. Among the other traditional indicators of a company’s rapid growth there are also

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<sup>1</sup> This article is a result of research “Aspects and trends of the economic growth of Ukraine”

the access to financial resources, permanent demand in the market, etc. At the same time innovative technologies are introduced into manufacturing and management processes, quality control is in place and managerial culture is raised to international standards.

Along with privately owned high-tech quickly growing and profitable companies state run companies continue functioning in Ukraine, though they incur losses and are associated with financial risks (Table 1). Thus, in 2014 net losses of state-controlled companies and enterprises with some share of public funds in their capital stood at 103,3 bln of Ukrainian hryvnias (UAH). They contributed 23,4 bln UAH to the national budget. The main factors that caused these losses were falling exchange rates (resulting from hryvnia's depreciation), price growth of raw materials and commodities, cost of energy generation exceeding regulated energy prices, falling sales, etc. Revenue losses induce the risks of falling tax collection and other payments to national budget, and non-payment of government guaranteed loans (as of 01.01.2015 the *de facto* debt was 49,7 bln UAH with 41,7 bln UAH of that amount being loans in foreign currencies).

Public budget support of these enterprises was around 10 bln UAH in 2014 with 4,5 bln UAH of that amount being tax credit and 5,4 bln UAH – direct public funding, 1,6 bln UAH out of which was taken from a special fund and used for improving stability of electric power supplies in Ukraine. High voltage power lines were constructed to link Rivne Nuclear Power Plant (NPP) with Kyiv, Zaporizhia and Kahovka. Further 2,7 bln UAH were used to repay government guaranteed loans for the projects Cyclon – 4 and National Satellite Communications System; 1,1 bln UAH were used for public funding of coal mines partially covering their high costs of coal production.

As we can see, state owned enterprises of the “real sector” of economy are associated with high financial risks, operate with losses and are a burden for the nation, although they receive substantial public financing and enjoy tax breaks. They, therefore, are not able to develop productive forces in those sectors of economy, where they function.

**Table 1**  
**The list of state owned enterprises that incurred losses in 2014**  
**and are associated with highest fiscal risks, thousand UAH**

№	Name of a company	Amount of financial aid			Revenues to the national budget	Net loss
		total	including			
			aid from national budget	tax credits		
1	2	3	4	5	6	7
1	National Joint Stock Company "Naftogaz Ukrainy"	3659291,4	-	3659291,4	12287403,4	-85044810,0
2	State Enterprise "Energoatom"	-	-	-	5640607,0	-6494416,0
3	SE "Ukrkosmos"	556806,6	556806,6	-	9473,0	-2280527,0
4	SE "M.Yangel Design Bureau Pivdenne"	2150014,2	210698,1	43032,4	215149,0	-1838462,0
5	State Food and Grain Corporation of Ukraine	-	-	-	117010,0	-1364912,0
6	SE "National Power Company Ukrenergo"	1664876,3	1609465,4	55410,9	779785,0	-1198528,0
7	SE "A.Makarov Manufacturing Combine Southern Machineworks"	181563,1	-	181563,1	135820,0	-1178564,0
8	Open Joint Stock Company "Lisychanskugol"	451685,4	450889,4	796,0	213373,0	-840785,0
9	SE "R&D and Gas Turbine Manufacturing Combine Zaria Mashproect"	103,0	103,0	-	545888,0	-541344,0
10	SE "Ukrspirt"	-	-	-	317949,0	-532235,0



11	SE “Ukrainian Fast Railroad Company”	21867,0	-	21867,0	22922,0	-416476,0
12	Kharkiv State Aircraft Manufacturing Company	87360,0	-	87360,0	75348,0	-389701,0
13	JSC “Odessky Priportovy Zavod”	-	-	-	411783,0	-270473,0
14	SE “Shidniy Iron Ore Enrichment Plant”	596,9	-	596,9	435867,0	-233599,0
15	SE “Selidovugol”	637310,0	636796,0	514,0	417516,0	-223644,0
16	SE “Regional Power Lines”	306,0	-	306,0	140445,0	-177010,0
17	SE “Boryspil International Airport”	265622,0	-	265622,0	231527,0	-126818,0
18	OJSC “Sumychimprom”	178290,0	-	178290,0	179506,0	-99414,0
19	Ukrainian State Transport and Communications Enterprise “Ukrposhta”	-	-	-	1196285,8	-4150,0
	<b>TOTAL</b>	9855691,6	5361042,2	4494649,4	23353657,2	-103255868,0

Source: compiled from the survey of 30 state owned enterprises with highest financial risks. [Ministry of Economic Development and Trade of Ukraine – Ministry of Finance of Ukraine, 2015]

The data of Table 1 demonstrate that the majority of the companies are in high-tech manufacturing sector and they, in accordance with observations laid down previously, ought to drive innovative modernization and constitute the points of growth in the current search for the ways out of the crisis. On the other hand, the state owned companies that make losses ought to be privatized in order to increase the amount of privately owned assets, as privatization is at the moment of the main components of structural reforms. These reforms are supposed to strengthen institutional foundations of market environment and of private initiative as a means of augmenting the capitalization of companies and enhancement of their competitiveness. At the same time, as the examples of privatized industrial companies showed in our earlier works, privatization under the circumstances and the laws currently existing in Ukraine, may not be always conducive to the development of market environment due to a number of factors, including, among others, the inadequacy of institutions that shape out regulatory environment for the economy of Ukraine.

In arranging the values towards which the participants of the markets can be oriented some role is played by the norms and rules (institutional components of reforms) set by the state. This is in addition to the price indicators that market participants get from the market. The state observes their compliance with these values. This, together with the prices, determines rationality of the behavior of the subjects of economic activities. If the market participants comply with the market liberties only, the rules would only determine their irrational behavior. If the opposite is true, they can fall victims of violence, if we take into account the fact that their individual failures may be caused by their erroneous orientations and decisions<sup>2</sup>.

## **II. WELFARE STATE AND THE EFFECTS OF PRIVATIZATION IN UKRAINE**

In current conditions the dominant idea in the Ukrainian establishment is that the deepening of reforms should be driven by the policy of pragmatism. The main goal of the latter is the accomplishment of the aspirations to gain profits on the basis of economic freedoms that are the foundation of the pyramid of success and bring about better quality of life of the citizenry. Structural reforms are deemed to be the main method of achieving success on this path. Deregulation and privatization are key factors of success of the policy of structural reforms. But, according to Professor M.Chossudovsky from the Montreal Centre for Research on Globalization, in practical terms the opportunities for the reach to become richer often arise not from the development of real economy, but from the officially authorized machinations, manipulation and speculation, which cause controversies and even shocks.

From the point of view of benevolence of the state, resolving the controversy between poverty and wealth is related to the development of “welfare state”, as was pointed out by Lorenzo von Stein (middle of XIX century). Its notion derives from ideological proposition that such state may help reaching equality and freedom and lift the deprived to the level of the rich and powerful. We consider it fundamentally important, because axiomatic honesty of individual and institutional market agents is but of limited validity due to their persisting propensity for increasing advantages to increase incomes and wealth in the conditions of massively imperfect market competition and irrational exuberance of market agents. Individualization of the behavior of the subjects of economic activity ruins in these conditions benevolence and intellect, as the results of reforms in Ukraine have only made obvious.

In case ‘welfare state’ is not subscribed, proposition of survival of not simply the fittest, but of most clever is applied, because the physically fittest may also be benevolent. The most clever can use hidden manipulation and even exert direct crime, even with globally negative indications. This specific aspect brought about systemic crisis not yet successfully overcome.

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<sup>2</sup> See also: Hoppmann E. (1999): “Unwissenheit Wirtschaftsordnung und Staatsgewalt” in: Vanberg, V. (szerk): Freiheit, Wettbewerb und Wirtschaftsordnung, Freiburg.

Analysis of previous experience of privatization in 2000-2010 done by the Institute for Economics and Forecasting of the NAS of Ukraine [Heyets, 2015] showed that the expected transformational results were not achieved by privatization, which had been viewed as a key and strategic factor in the transition to market economy. The main reason for this lack of results was the inadequacy and serious deficiencies of the legislation that regulated privatization, and constant violations and non-compliance with this legislation. These enabled the participants in privatization to influence economic order or purposefully design it as non-competitive. And the state was left in charge of compliance. Thus the egoistic aspirations of market participants and those who took part in privatization were not limited in their drive towards the increase of influence of oligarchic entities. Often these were one and the same people – the owners of businesses and civil servants. As a result, privatization did not change in principle the situation with competition in Ukrainian market. According to the data of the Antimonopoly Committee, only 40,4% of industrial produce were sold at competitive markets. All the rest was sold at: 22,7% oligopoly markets, 20,0% at monopolized markets and 22,7% at the markets were one company dominated. At the same time, the level of manufacturing concentration in the industrial sector is very high. 10 largest companies sold 22,4% of industrial products, 100 biggest companies accounted for 62,3% of all industrial products sold. Moreover, these largest companies represented only 0,2% of the total number of industrial enterprises and they were all under the control of one single private business. This understandably lead to excessive concentration of wealth in a few private businesses and increasingly influenced the behavior of their owners, thus affecting the decision making process. In addition to that, Ukraine's annual losses from economic activities of monopolistic entities, as has been shown by the calculations of Doctoral Candidate in Economics O.Pustovoit of the Institute for Economics and Forecasting, can be estimated minimally at about 4% of the country's GDP [Pustovoit, 2008].

Society opposed the inefficiency of the state of the past seeking to democratize social life. It hoped that a new policy of market relations will bear desirable fruits, first of all in making the economy more efficient and in raising the standards of living. This was not the case in the past, because the transformations did not eliminate the ineffective model of economic activity of the state. This model throughout all the period of Ukraine's independent existence has been unable to withstand the pressures of big business, who, having united in various groups, has been lobbying for the decisions and was setting priorities. The state has only too often actively favoured this process. Therefore Aristotle's view of a state that lost some of its governing capacities, and all of them in certain areas, having become a hostage of oligarchic clans, is quite valid in the case of modern Ukraine. As a result of this situation Ukraine has got two revolutions. But again and again it faces the question about the role of the private business in resolving its mounting problems. Is that role going to be a role of dominating monopoly, of oligopoly or them alternating in the course of a new stage of privatization? It is important today to assess the mood of the society, so that the third "Maidan" does not happen. The attitude of the population towards privatization processes is to be considered. Table 2 displays the results of sociologic researches done by the Institute of Sociology of the NAS of Ukraine on the privatization of large enterprises, small enterprises and land in 1992-2014.

Table 2  
Attitude of the population to privatization in Ukraine in 1992-2014

Attitude	Attitude to the privatization of ...					
	Large enterprises		Small enterprises		Land	
	1992	2014	1992	2014	1992	2014
More negative than positive	31,6	54,4	13,6	25,9	13,9	52,9
More positive than negative	25,1	19,9	56,2	43,1	63,5	21,6

Source: Golovakha E. – Panina N. [2014]

The data in the table above shows that in 22 years of observation of institutional environment with regard to the formation of the institute of private property through structural reforms that were done by privatization of public assets the attitude of the public to this process was only worsening, as the number of those perceiving privatization of large enterprises negatively grew 1,7 times, privatization of small enterprises 1,9 times, privatization of land 3,8 times. The number of citizens treating privatization of large enterprises more positively than negatively reduced by almost 21%, small enterprises – almost 25% and privatization of land 68%. In the conditions of political instability the society that shares these attitudes and has lived through two “Maidans”, losses of territories, “hybrid” hostilities is going to gain more and more “ownership” of the conditions of its life. It will seek to improve the situation by altering economic relations, making them capable of development. It will try to overcome existing dependence on oligarchic relationships and raise the governability to a level that can make the state able to protect itself against the pressure from the outside and withstand the influence of the oligarchs.

Phenomenon of substantial deterioration of the attitude of the public to privatization must be explained first of all by the changes of the population’s attitude to labour, as the larger part of the workforce is already employed in the private sector. At the initial stage of reforms the workingmen, according to J.Sapir, endorsed privatization, viewing it as an instrument that “... could relevantly measure up socialism and productivity of labour” [Sapir, 1992]. That means that the population viewed the results of privatization as preconditions for more dignified rewarding of their work. It expected high wages and preservation of high level of employment, at least as good as it used to be. Most importantly, the minds of the people were dominated by the illusion pushed by the ideologists of the then reforms that the population would become a collective owner of the public assets that were privatized. That was one of the paramount errors concerning the processes and effects of privatization in Ukraine, to which pointed yet in 1996 the director of analytical section of “CAT” (Lviv) L.Rybun [1996].

Economic and social situation has cardinally changed as a result of privatization: we can see mass unemployment and the need to change employment despite one’s education and professional qualification has arisen. New jobs have appeared in the other

professional fields and often in the other regions, most frequently in the other countries. This motivates internal and outbound migration. In addition to that, massive cases of non-payment of wages and bankruptcies of enterprises have become ubiquitous. These changes of attitude to work resulted in the changes of attitude to privatization. Privatization, on one hand, has not yet fulfilled its function, and on the other hand, has drastically changed the relations between employees and employers, bringing them to the level of socio-political conflict. The pressure on labour has increased, and current situation is characterized, on one side, by uncontrolled incomes of the owners who exert significant influence on political life, and on the other side, by massive impoverishment of the populace that for this reason have to take more active part in political processes.

Against this backdrop privatization as one of the elements of modern structural reform should be done on the basis of the decisions that will at least not worsen the situation but improve it, especially through the processes of modernization grounded in respective technological changes. Previous model of economic growth has exhausted itself. Current Ukrainian political and economic doctrine views as limited the ability of the state to influence processes of modernization of the economy. At the same time, experiences of modern world make it necessary to change such ideology, as even transnational corporations, whose HQs are located in highly developed countries, have enjoyed and continue enjoying permanent support of the state, both economic and political. We also need to remember that economic and market power of large corporations can shape the effects not only for corporations themselves, but for the whole economy and even for some regions, where their operations are located.

### **III. PRIVATIZATION AGAINST THE BACKDROP OF PATERNALISTIC ATTITUDES OF POPULATION, RESTRICTION OF SOCIAL GUARANTEES AND FAILURES OF THE STATE AND THE MARKET**

There are enough examples of successful corporatization in the world, as well as examples of the development of a country in general. The state takes direct part in these processes. For example, relations between corporations and the state have for the last half century determined one of the most successful models of economic development. Large South Korean business combines (chaebols) have practically demonstrated the fulfillment of the ability of the state to shape out competitive private business that has become transnational in a relatively short time in historical terms, and whose role became decisive for the modernization of national economy [Fedorovsky, 2008]. There are some technologically advanced Ukrainian companies that make losses. Among them there is, for instance, national joint stock power company Energoatom, which paid 5,6 bln UAH to the national budget in 2014 and made in the same period 6,5 bln UAH of losses. This company has not received a single hryvnia of public funds and no tax breaks. With total added value of the company (gross income, wages, depreciation and other duties minus subsidies and grants) of 18,9 bln UAH in 2014 it paid that year 8,1 bln UAH, its tax burden amounted to 42,9% [Energo Atom, 2015], which is rather a lot by European standards. The data of international auditing company PWC the total tax burden of



large companies was 35,4% [Business Council of Canada, 2016] in Canada and 41,4% [PWC, 2016] in the UK.

After three years of operations at a loss (-2,7 bln UAH in 2012, -4,1 bln UAH in 2013, - 6,5 bln UAH in 2014) Energoatom earned in 2015 net profit of 1,2 bln UAH [Ministry of Economic Development and Trade of Ukraine – Ministry of Finance of Ukraine, 2015; Energo Atom, 2015].

The problem of losses by the state-owned Ukrainian businesses can be considered a reason for a review of their institutional status. As an example of the performance of privately owned companies though, the net losses of predominantly private medium and large industrial enterprises in January- September 2015 were 90 bln UAH. 75% of these losses were made by processing industry. Only textile factories worked profitably at that time and some of the leather processing manufactures, those of clothing and leather goods. Coke plants and oil refineries were also profitable, as well as some producers of basic pharmaceutical products and medicines. This brings us to the conclusion that ubiquitous loss-making of Ukrainian industrial private companies, although they could be profitable, does not open any good prospects for capitalization of their profits, thereby undermining trust in both private (Table 2) and state ownership.

We therefore observe the failures of both the state, and of market institutions, in particular that of private property. The latter was not developed in a natural way in Ukraine (but through privatization) that in essence was an absolutely artificial process. It often was illegal morally and ethically, which, again destroyed faith in it.

Research done by the Institute for Economics and Forecasting of the NAS of Ukraine shows highly paternalistic mood among Ukraine's population in the middle of 2015. They demand larger guarantees from the government. The policies of the latter are at the same time aimed at supporting private initiative via deregulation and further structural reforms with new restrictions of social guarantees, freezing of wages and pensions. Therefore we witness the condition of failure to control the results of economic activity by both the market and the state. This failure makes both state-owned and private companies operate at a loss. In this case the question arises of the results of using of politico-economic model unable to provide the needed level of democratic mechanisms, as, according to A. Robinson [Robinson – Acemoglu, 2006], both economic theory and practice admit positive interconnection between democratic political organizations and economic efficiency. It is only natural therefore that the population has this level of paternalistic attitude and does not see any "advantages" in the liberties that liberal approach presents as conducive to the implementation of one's potential. On the contrary, according to the opinion polls, the citizenry often prefer a model of development for their country, where there are not many political liberties, but strong economic growth. The results of the opinion polls [The Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine, 2015] made in 2015 are the case in point. According to these, the citizens are for various reasons ready to cede to a certain extent their liberties in exchange for material wealth. The state should, in their view, be in charge of improvement of their living standards. According to our experts, the reasons of that attitude vary, ranging from disappointment in democracy (although this category is not numerous), to the idea that some part of democracy may be exchanged for wealth without losing anything. The latter view seems to us more realistic. A question

then arises that can be answered by Ukraine's political and economic system: will the population accept liberal reforms further, when liberty, materialism and paternalism continue existing as the two of their conjoined components, or will the people not accept them? In this case we have to acknowledge that this readiness of the population to renounce some of their economic freedoms in exchange for wealth can be realized through the policy of the so-called liberal paternalism, under which the state will permanently sustain paternalistic attitude, declaring new and more economic privileges that will be ever more difficult to support as modernization of the economy will be delayed further on. If this is the case, the state will be forced to borrow its policies through, and this will lead it nowhere.

#### **IV. GETTING LARGE VERTICALLY INTEGRATED ENTERPRISES UNDER THE CONTROL OF THE STATE AS A MEANS OF ELIMINATION OF ARTIFICIAL MONOPOLIES**

Organizational inefficiency of business activity may also be connected to the deficiency of competitive environment, first of all in industrial sector. Structural features of Ukrainian industrial market (Table 3) demonstrate that its main industries, like steel and chemical, being key industrial exporters, operate under the conditions of monopolistic or oligopolistic organization and, as was mentioned earlier, extremely high concentration of industrial production. One of the reasons, but far from being most important, is the large size of industrial enterprises in the former USSR.

Privatization in Ukraine has happened so that the uncontrolled access to that process and political endorsement of the proprietors of some large enterprises resulted in the formation of large vertically integrated companies with these enterprises under their control. These companies are based abroad. Such form of integration allow to expatriate the profits abroad, maintaining monopolistic prices for commodities in the domestic market and avoiding taxes due to the inflated domestic prices of the commodities. The state might be tempted to terminate this situation by taking these companies under control, first of all through reinforced regulatory activity and by setting price controls in order to stop unfair competition in the environment dominated by artificial monopolies. This is one of the options that might

Table 3  
The structure of Ukraine's industrial market

Branches of industry	Domestic markets			Foreign markets
	Competitive	Oligopoly	Monopoly	Under competitive influence of foreign markets
1	2	3	4	5
Steel industry and metal products	Limited competition among small and medium enterprises	Indicators of oligopolistic domination of the market of steel products, inertia with regard to technological progress	Monopolistic sharing of assets among large companies	Dependence on the dynamics of foreign markets, low competitiveness of the majority of the companies except a few
Textile and clothes manufacture	Intense competition in domestic market among both domestic and foreign companies	-	-	Inadequate concentration of internationally competitive domestic manufacturers
Leather and leather goods, other materials	Fierce unfair competition on the part of importers, first of all of Chinese products	-	-	-
Machinebuilding	Competitive environment with competing one manufacturer and a few importers	-	-	-
Chemical and other non-metal products	Competitive environment for rubber and plastic products	Oligopolistic market for basic chemical products	Monopolization for nitrate chemical and pharmaceutical products	-



Wood products, paper, printing industry, furniture	Highly competitive, corruption at the auctions of timber	-	-	Foreign competitors active in domestic market
Food products	Competitive environment and further deregulation of the market	-	-	1. Discrimination of some Ukrainian products in Russia. 2. High level of harmonization of standards and regulations to those of the EU

Source: information and analysis of Ph.D. L.Daineco.

produce more positive results. But it cannot be viewed as a freeway into the future, because market environment is being distorted more and more, and this will not facilitate competitiveness and efficiency. Structural reforms aimed at making competition more active may be an alternative with respective new deregulation measures lowering barriers to entry to the new companies and to exit to the existing ones.

## V. PUBLIC SECTOR COMPANIES – A LOCOMOTIVE FOR THE DEVELOPMENT OF THE ECONOMY OF UKRAINE

It is worth pointing out that in the 2000-s the role of state-controlled companies started growing [Radigtin – Sikachov – Antov, 2015]. This was the result of not only the weakness of mechanisms of protection of the rights of private property, affecting the efficiency of private business, but also of instability of national, and particularly global markets, manifesting itself in a significant fall of global trade and simultaneous reduction of growth rate of global GDP. If in the XX century world trade was growing three times faster than global GDP was growing, in the 2000-s of the XXI century they leveled with the growth rate of 3,2 - 3,4% with the same forecast of the IMF for 2015 and 2016.

In these conditions under the influence of governmental policies in some countries public sector companies are viewed as an anchor of stability in a programme of overcoming a crisis. Current government policy in Ukraine goes in opposite direction because of, among other things, low ability to resolve existing problems in today's system of governance. Besides that, in Ukraine due to the above mentioned fiscal risks in many state-owned companies there is a motivation to privatize them, which is at the same time a source of revenue for the national budget that depends on foreign financing. Instead of supporting the development of high-tech state-owned companies as potential drivers of stabilization and development of the real economy in Ukraine, main part of them may opt for privatization. But there must be some exceptions. One of them must be state company "Ukroboronprom". In view of armed conflict in the country

and dangerous outlook for it, as well as growing government outlays for defence, this company may further concentrate its production and R&D to meet growing orders for the production of high-tech military equipment and armaments and must by all means increase their exports. If it does not happen, the economy of the country will be overburdened, which will impede Ukraine's economic growth.

Given the status of this company and types of its activities, it may and must be considered a special natural monopoly given Ukraine's conditions and international practices leaving centralized control of the most important manufacturers and branches in the hands of the state.

Vertically integrated "Ukroboronprom" ought, in our view, to focus on expanding its offers and sales by developing trade ties that can replace those lost because of the conflict with Russia. It must do so by retooling its enterprises to be able to offer to expand its sales, first of all, into the countries that use weaponry and equipment manufactured in the former USSR. It must also start looking for new clients after initiate the production of new components and spare parts increasing the effectiveness and tactical characteristics of military hardgear. "Ukroboronprom" should amplify its collaboration with the EU countries, incorporating itself into the new chains of added value in order to expand its presence in the international market of weaponry in increase hard currency revenues for Ukraine. As outstanding traditions of defence equipment and armaments R&D were developed in Ukraine in the Soviet time, when multiple research institutions were based in the former republic of the USSR, it is worthwhile to revisit a possibility of their participation in the company's work. It also makes sense to include some private contractors into this company, as is the practice in many countries of the world.

Ukraine's military-industrial complex may and should become one of the pillars for raising technological level of the nation. Defence industry along with air and space enterprises have been yet one of the best technologically and innovatively developed. They could because of that integrate into global market, including the market for their finished products, especially when they have their own technologic results. These provide the highest added value and technological independence and breakthroughs that some nations that already are a part of global value chains are unable to do.

It is necessary to establish, using the experience of such countries as the USA, UK, France, China, India and others, a governmental agency that would do R&D for the military-industrial complex and will provide orders and manage R&D and innovations in the defence sector and related industries capable to resolve the problems of technological modernization of the civil sector of the economy of Ukraine.

Nuclear power of Ukraine is another industry that can provide substantial impetus to her technological development by enhancing the level of advanced technologies in Ukrainian economy, albeit state-owned company Energoatom is running fiscal risks.

State company Energoatom operates in competitive environment, because other power generating companies in Ukraine are privately owned. They all work in the conditions of regulated tariffs that are set by the government (final transition to market price-setting is only expected to be completed in 2017). It is important though to analyze the options of preserving state ownership of Energoatom and of its development as a high-tech corporate-type utility. The matter is how to turn this company into a driver of development on national scale. Foreign experience could be exploited to improve its

financial results and turn it into a factor of stabilization of economic modernization of Ukraine.

The company's production is considered in Ukraine high risk and high-tech at the same time. Fiscal support by the government is limited to only the option of tax credit. But Energoatom needs public support at least for the period of restructuring and modernization, as it is very small-scale tax contributor. Its level of tax contributions in 2014 was eighteen times lower than the average for the subjects of economic activities in Ukraine. Its productivity is at the same time 1,1 times higher than Ukrainian average and depreciation of its assets is 1,3 times lower than Ukraine's average. This is an evidence of Energoatom's higher than average efficiency thanks to higher than Ukraine's average productivity, but lower tax contributions due to higher value of assets, typical for nuclear power industry.

There was until recently special price regulation in power industry, especially in nuclear power branch. The reason for that was the influence of energy prices on the costs of industrial production and price of energy for the public. As the level of energy prices is expected to grow significantly during 2016, financial results of Energoatom are expected to improve significantly too. This can increase its tax contributions and revenues, and can potentially facilitate its modernization, because the level of its technological wear reached more than 63% at the end of 2014. It is still better though than the average level of wear of means of production in Ukraine's economy (83,5%). But for nuclear power industry that is technologically highly risky, this level of wear is quite high. Because of this it is important to focus on modernization of this sector through the so-called industrialization through innovations [Low – Tijaja, 2013]. This situation must improve with more effective science and technology policy, that can be implemented in Ukraine because of highly developed fundamental and applied science research in nuclear energy realm.

A number of entities supporting the operation of nuclear power plants (NPPs) are part of Energoatom company. Some of them may and ought to be privatized, having protected the entities employed in most technologically risky operation from the influence of market relations that are supposed to become deeper in 2016-2017. NJSC Energoatom has accumulated substantial experience in operating nuclear reactors, it has highly educated and professionally trained employees. Fundamental nuclear science is also well developed in Ukraine. That is why further development of nuclear power industry is needed. It may become a promoter of technological modernization of Ukraine's economy not only with electricity generation, but also with manufacturing of nuclear fuel for NPPs that contributes to increased production of uranium and to the whole cycle, including science research and development. It will enable Ukraine to substitute its import of nuclear fuel, and, most importantly, raise to a new level Ukraine's whole economy through expanding nuclear cycle. Ukraine is in possession of one of the largest uranium ore deposits in the world, as well as deposits of zirconium ore. Private financing along with public, and the funds of Energoatom itself that will be accumulated through higher electricity tariffs need to be drawn along with the funds of donor countries and international financial organizations.

Table 4  
Tax burden and economic results of the enterprises of public sector of Ukraine in 2014

Nº		Taxes and duties paid, % of added value	Taxes imposed, % of added value	Labour productivity, thousand UAH	Proportion of taxes and duties paid to the value of fixed capital (without depreciation)	Proportion of taxes and duties paid to the value of fixed capital (without depreciation)	Technological wear of assets, %
1	State Enterprise "Energoatom"	14,93	42,92	672,15	0,05	0,13	63,03
2	SE "Electron-mash"	26,72	22,21	70,40	0,22	0,31	29,30
3	JSC "Odessky Priportoviy Zavod"	57,07	55,31	1433,74	1,96	5,00	60,85
4	JSC "Ukrainske Dunaiske Paroplavstvo"	29,89	23,35	193,75	0,53	4,68	88,68
5	JSC "Lysychanskvughillia"	-98,73	-77,44	26,53	0,09	0,12	22,39
6	JSC "Odesska TETS"	43,55	31,26	634,28	0,72	2,97	75,85
7	JSC "Gaivoronsky Teplovozoremontniy Zavod"	15,76	20,15	216,69	0,73	4,60	84,06
8	JSC "Sumichimprom"	41,02	28,60	440,70	1,39	3,09	55,03
9	JSC "Construction Company "Ukrbud"	36,43	33,67	165,42	0,56	0,62	10,12
10	JSC "Azovmash"	20,14	16,96	111,38	4,47	28,95	84,57



11	JSC “Ternopilskiy Radiozavod “Orion”	19,24	15,96	75,18	0,55	1,71	68,06
12	JSC “Zakarpatsky Zavod “Electroavtomatika”	26,45	25,97	98,32	0,80	2,90	72,48
	Ukrainian economy average	-	-	663,91	0,35	2,48	83,5

Source: calculated on the basis of financial reports of Ukrainian enterprises [Energ Atom, 2015; Smida, 2014]

Drawing financing from various sources is an important but rather tedious business. Besides, resources of Ukraine’s public budget are rather limited. Therefore the key role will play the enterprises’ own funds, for example the funds of Energoatom itself if the government made a decision to introduce a special surcharge. The government also has to make a decision about Energoatom’s tax burden, as it is tax burden that causes the company’s fiscal risk. Table 4 shows that Energoatom’s tax burden (42,92%) is second only to Odessky Priportovy Zavod (55,31%) among all enterprises of Ukraine’s public sector. Operations of this company in 2013-2014 under heavy aggregate tax burden and with losses reduced its own financial resources and increased the risk of its debt (in 2014 it grew 7 points).

Effective aggregate tax burden of JSC Energoatom was higher in 2014 than even of the companies of Canada (21,1%), Great Britain (33,5%), Finland (40,1%), Poland (40,1%), Korea (33,1%) and some other countries [The World Bank, 2017; International Bank for Reconstruction and Development – The World Bank 2015]. According to the data of the World Bank as presented in the “Doing Business 2016” survey, in 2015 the tax burden was reduced in the UK, Canada and other countries trying to stimulate economic growth through innovations.

In case the decision mentioned above is not enacted, the fiscal authorities could at any moment implement tax burden of that level, eliminating an opportunity to raise the role of nuclear power industry and accomplish the programme “Nuclear Fuel”. In which case it will soon become clear that the replacement of fuel rods imported from the Russian Federation with nuclear fuel from other countries, who will incur certain losses while adapting their products to our technical requirements, will create additional difficulties for Ukraine even if it renounces the new suppliers in the future. This will slow down, if not stop modernization of Ukraine’s nuclear industry through the development of manufacture of its own nuclear fuel. It is important to initiate the research of the economic effect that can be obtained from the development of nuclear fuel production cycle in Ukraine, using already available experience. Scenarios of development of nuclear power industry can be developed with the participation of the Institute for Economics and Forecasting of the National Academy of Sciences of Ukraine. These scenarios can vary within prospective energy balances of Ukraine using the methods and



model that has been previously developed in the said Institute. Specific issues could be researched, like:

- prolongation of the terms of operation of 10 nuclear reactors for 50 more years (without Rivne NPP's reactors 1 and 2, South Ukrainian NPPs reactors 1 and 2, Zaporozhye NPP's reactor 1);
- reuse of recycled nuclear fuel that can reduce 30% the demand for raw uranium;
- creation of an integrated high-voltage power transmission loop linking Ukrainian NPPs in order to guarantee the export of surplus electricity. Forecasted power consumption ought to be taken into consideration along with the proposed prolongation of operation life of nuclear reactors;
- production of uranium for each year in connection with production costs and prices in the world market;
- manufacture of zirconium roll stock and zirconium products;
- manufacture of nuclear fuel in Ukraine;
- creation of thorium nuclear fuel production cycle.

The following issues should be analyzed meticulously:

- economic effects of the projects, their costs;
- minimal output of electricity by Ukraine's NPPs should be calculated guaranteeing that the economy of the country does not collapse. Financing of the prevention of such scenario can be unlimited (as the price of medicines for medical patients, for whom the price of a needed medicine does not matter);
  - the option of replacement of nuclear power with electricity generated by thermal power plants, or with imported electricity;
  - economic efficiency of nuclear power industry and elements of the nuclear fuel cycle can be analyzed by applying international methodologies (INPRO, TAIM, "Ukraine" etc.), as well as losses from accidents with introduction of a coefficient of the value of undersupplied power, given the structure of agricultural and industrial sectors (for CPCP-100),
    - mechanisms of financing through Energoatom's rate;
    - Ukraine's energy consumption outlook and potential exports;
    - forecasts of world prices of uranium, zirconium, uranium enrichment services, production of nuclear fuel;
    - prospects of construction of new nuclear reactors and their profitability;
    - whether the MOX fuel and technologies CANDU and DUPIC can be used;
    - prolongation of the terms of operation of VVER-1000 nuclear reactors for another 20-50 years, bringing their operation close to maximal capacity and their safety to international level;
    - creation of technological and legal prerequisites for the export of all excessive nuclear electric power (generated in excess of Ukraine's energy balance demand) to the EU and other countries.

In our view, all the research work should be commenced in 2016, or at least not later than in 2017.

Advice on turning Ukroboronprom, Energoatom and other state-run companies into the institutions of economic development of the country will reflect the logic of construction of such institutions capable to modernize Ukraine's economy through innovation. Current low level of renovation of the economy and the problems of its regulation in the context of implementation of the Ukraine-EU Association Agreement are presented in a detailed report of the NAS of Ukraine, "The Innovative Ukraine – 2020". It will be important to find the opportunities to involve private investment on the basis of outsourcing for these state-owned companies so that their capitalization is raised. Ukrainian state will hardly have any funding for these investments yet for a long time. As these state companies operate according to the priorities of the state, assessment of their operations should be based on the degree of success in their reaching strategic priorities of innovative development. Otherwise, today's economic policy of stabilization and deregulation in global economic environment of imperfect international markets and low competitiveness of national economy will continue keeping our country's economy in its capacity of a mere supplier of raw materials, and its economic success will only depend, even in the course of implementation of the Association Agreement, on the levels of commodity prices and of only the products produced in only the primary processing of these commodities.

Formation of these state vertically integrated companies, oriented in their development to perform the function of the institutes of development, supposed to be able to compete with foreign manufacturers can be viewed as a new alternative to the current disorienting practice regarding the growth of innovative development and the start of getting out of crisis through modernization of the economy. We should also keep in mind that the process of formation of the institutions of development is a lengthy process due to high inertia. Therefore continuity from one government to another, from one Verkhovna Rada to another are needed to tackle this task regardless of political preferences but with national strategic interests in mind.

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