

Structural Challenges for SOEs in Belarus

A Case Study of the Machine Building Sector

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Abstract

Are Belarus's state owned enterprises positioned to grow in 2011–2015 as successfully as in 1995–2006? State owned enterprises account for 55 percent of Belarus's output and two-thirds of overall employment; economic growth in 1995–2006 was the result of capacity expansion and productivity improvements in state owned enterprises. These sources of economic growth originated in policy decisions that preserved the functioning of the command and control economy and allowed the country to exploit preferential commercial access to the Russian market in several goods and services.

Are the same reasons likely to facilitate the performance of state owned enterprises and overall economic growth in 2011–2015? This paper concludes that this is not likely to happen. Times have changed: the

slowdown in production and exports in 2009–2010 was unquestionably associated with a transitory decline in demand for durable goods in Russia. But there have also been more permanent market forces at work: a steady increase in competition in Russia and other Commonwealth of Independent States markets resulting from low-price Chinese and Russian-produced capital goods; and a shift in demand from low-quality/low price to high-quality, high-price transport equipment demand in Russia and other Commonwealth of Independent States markets. And these forces are there to stay. This conclusion leads to the following questions: Would state owned enterprises be able to adapt to observed market changes? What reforms would be relevant to facilitate the necessary adaptation?

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STRUCTURAL CHALLENGES FOR SOEs IN BELARUS: A Case Study of the Machine Building Sector¹

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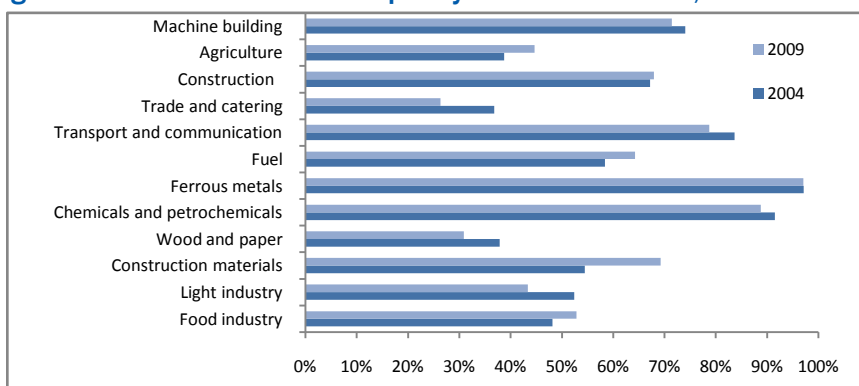
A. Background

SOEs' role in Belarusian economy

In the 1990s, most members of the former Soviet Union implemented deep political and economic transformations and sharply reduced the share of state ownership in economic activity. Belarus followed a different tack: it preserved functioning political and administrative institutions and opted for enterprise consolidation forcing better performing enterprises to take over loss makers rather than to divest, shed labor and close down chronically unprofitable ventures (World Bank, 2010_a). This strategy had a clear short-term payoff in that it avoided the collapse of governance that prevailed at the time in several other countries of the region, and resulted in deep social hardship and losses of output; whether it just postponed temporarily an unavoidable collapse is a matter of contention. What is not arguable is that the path chosen slowed reallocation of resources away from inefficient sectors and has been an obstacle to the introduction of organizational and technical innovations to adapt the SOEs to compete in the world market.

With this strategy in place, the importance of SOEs has not diminished following the opening of the economy to the private sector (Table 1.1, Figure 1.1). This is especially the case in capital intensive sectors such as ferrous metals, production of chemicals and petrochemicals and construction materials sectors where SOEs account for more than 90 percent of output. On average, SOEs account for 55 percent of Belarus's output and two-thirds of overall employment (Table 1.1).

Figure 1.1: Share of SOEs in output by economic sectors, % total



Source: Belstat, Authors estimates.

Table 1.1: Share of SOEs in output, export and inputs of production in 2004-10, percent of total

	2004	2005	2006	2007	2008	2009	2010
1. Output	59.1%	59.6%	57.5%	56.7%	56.0%	55.2%	55.5%
2. Value Added	57.0%	57.8%	57.3%	55.9%	54.9%	53.9%	54.5%
3. Merchandise Exports	n.a.	n.a.	52.0%	55.1%	54.2%	41.5%	45.8%
4. Employment	68.9%	68.8%	68.4%	67.7%	66.0%	66.3%	65.6%
5. Fixed Capital Investment	61.5%	61.3%	60.1%	59.5%	59.5%	66.1%	66.2%

Source: Belstat, Authors estimates

The machine building sector

The machine building sector⁵ accounts for about a quarter of industrial production and comprises the most visible SOEs producing heavy trucks and tractors. It includes Belarus's best known large industrial enterprises—MAZ, MTW and Belaz (Box 1). From 2000 to 2008, the machine-building sector grew at a rate of 12 percent per annum.

Box 1: History of Machine Building in Belarus: case study of MAZ/ Minsk Motor Plant

The origins of the Belarus auto-motive industry can be traced back to the post-war economic reconstruction and recovery efforts. In the first post-war years two automotive enterprises were established in the city of Minsk: Minsk Automobile plant (MAZ) and Minsk Tractor Works (MTW).

Over the next decades MAZ became one of the largest producers of heavy trucks, busses and trolley busses in Eastern Europe with nearly 15,000 employees. Although MAZ specializes on two product lines - heavy trucks and busses- the range of products offered is broad: 250 different truck and 50 different busses and trolley busses. Its key markets remain the former Soviet Union states.

MTW became one of the world's largest manufacturers of agricultural equipment with nearly 20,000 employees. Over the last 50 years it produced over 3 million tractors and exported them to more than 100 countries around the world; currently it produces 62 models of different vehicles with more than 100 assembly options for all climates and operating conditions.

A second wave of industrialization started in late 1950s. In 1958, Belarusian Autoworks (BELAZ), a producer of mining dump trucks, was established. The development of big mineral deposits in the Soviet Union demanded large and powerful mining dump trucks. BELAZ developed more than 600 versions of mining dump trucks of payload capacity from 27 to 320 tons, and sold more than 130 thousand units of mining dump trucks in more than 60 countries of the world.

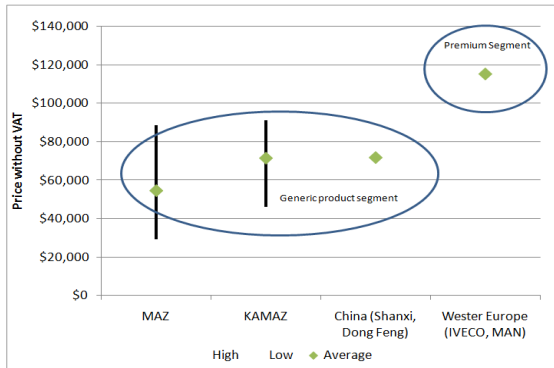
Similarly, Minsk Motor Plant (MMP), a producer of diesel engines, was established in 1963 as a spinoff of Minsk Tractor Works (MTW). After five decades it is the leading manufacturer of diesel engines not only in Belarus but in countries of the former Soviet Union; currently the Minsk Motor Plant manufactures over 250 engine specifications.

From its inception the Belarusian machine building sector specialized in the production of unsophisticated low-price products to a captive market, Russia and other the former Soviet Union Republics. This market specialization persisted as of 2010. For example, MAZ, a Belarusian heavy truck and bus producer, is positioned in a relatively unsophisticated low cost truck market niche, where it competes with KAMAZ, a leading truck producer in Russia, and Shanxi, a Chinese truck producer, (Figure 1.2a). MAZ and other Belarusian transport equipment producers occasionally venture into the production of higher quality products; but these production lines require the use of advanced strategic components (such as engines) produced by other suppliers, which considerably increases the final

⁵ Machine building sector includes automotive industry, production of agriculture equipment, electronic equipment, white consumer goods.

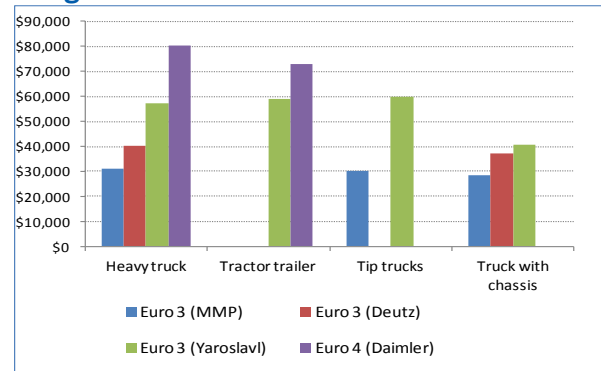
product price.⁶ The result is that MAZ trucks with engines produced by Daimler are on average about two times more expensive than heavy trucks with engines produced by Minsk Motor Plant (MMP), Figure 1.2b.⁷

Figure 1.2a: Product positioning relative to competitors



Source: MAZ, Kamaz.
Memorandum: Prices reflect average prices in Russian market without VAT converted to USD.

Figure 1.2b: Average prices of select product categories of MAZ trucks



A specialization of producing for a captive market permeates the business culture of these firms, most notably: low familiarity with competition, poor quality of services supporting final product sale and low attention to innovation and cost cutting. In the past, during the times of the command and control economy, demand was guaranteed regardless of the quality of the product offered; firms did not face the challenge of competition and had no urge to develop quality services supporting final product sale to attract customers. Breaking with this past and developing, for instance, post-sales services requires considerable up-front investment and “know how” neither of which may be abundant. This business culture also reflects in low attention to innovation and cost reduction as illustrated by the low share of expenditure in research and development in Belarusian industrial sector (in 2010, 65.5 percent of expenditures attributed to *technological innovations* accounted for purchases of new equipment, research and development accounted for only 21.4 percent and acquisition of new technologies for only 0.4 percent).⁸

Despite these limitations these enterprises have well established brands in the CIS countries. Brands such as Tractor Belarus, lorries and buses MAZ, mining trucks Belaz are known around CIS countries and are associated with low price and reliability.

Most machine-building enterprises are organized as vertical conglomerates. For instance, Minsk Motor Plant (MMP) is a vertically integrated concern with six subsidiaries producing components for the manufacturing of diesel engines. The companies are scattered across Belarus: OJSC “Borisov Assemblies Plant” in Borisov, OJSC “Gomel Starter Motor Plant” in Gomel, OJSC “Zhitkovichy Engine Building Plant”, OJSC “Radiovolna” in Grodno, and OJSC “Lidsky Mechanical Plant in Lida. However, not all vertically integrated MMP enterprises specialize in upstream production. For instance, «Radiovolna» specializes in the production of about 90 types of alternators, spare parts and units to engines produced by MMP and 90 percent of its output of electrical wire harnesses is sold to Volkswagen. The cooperation with VW began in 2003 and was facilitated by Radiovolna’s favorable

⁶ The higher product price reflects the low scale of production and the absence of skills to manufacture efficiently these product lines.

⁷ Trucks with Daimler engines are predominately aimed at potential customers in Western Europe, still a niche segment for MAZ

⁸ Source: Belstat. Note: Research and development is typically done in-house at research units, which often replicate already known technologies.

location in the north-west industrial district of Grodno on the borders with Poland and Lithuania and within the territory of Free Economic Zone «Grodnoinvest».

Vertical conglomerates comprise a large final output assembly plant and include many smaller producers of intermediary goods. Final goods assembly enterprises are employment-wise seven times larger than intermediate goods producing enterprises; they are also more export-oriented (Table 1.4); pay higher wages and employ more capital intensive technologies. In addition, these vertically integrated enterprises are often located in towns where they are among the largest employers. For example, MMP's subsidiary in Stolbtsi employs about 1500 people that are almost 10 percent of the total population of Stolbtsi (Table 1.5).

Table 1.4: Characteristics of vertically integrated enterprises (annual weighted averages 2005-2010)

	<i>Size (average employment)</i>	<i>Average wage, BYR million per year (2010)</i>	<i>Share of labor costs in total costs</i>	<i>Share of imported materials</i>	<i>Share of exports</i>
SOEs (all enterprises)	1,428	13.80	15.6%	32.9%	58.3%
Vertically integrated final assembly enterprises	7,305	16.19	12.8%	33.3%	71.3%
Vertically integrated intermediary goods producing enterprises	1,033	12.38	21.9%	20.7%	21.2%

Source: Authors estimates based on the NBRB dataset.

Table 1.5: Vertically integrated enterprises of Minsk Motor Plant (key characteristics)

<i>Name of the enterprise</i>	<i>Role</i>	<i>Employment at the enterprise</i>	<i>Km from Minsk</i>	<i>Employment as a share of total population</i>
Minsk Motor Plant	Final Assembly line	5800	0	0.3%
Gomel enterprise of engine starters	Subsidiary	530	302	0.1%
Zhitkovichsk motor works	Subsidiary	530	122	3.3%
Lida mechanical enterprise	Subsidiary	480	160	0.4%
Radiovolna factory	Subsidiary	2000	386	0.6%
Subsidiary in Stolbtsi	Subsidiary	1480	79	9.6%
Enterprise BZA	Subsidiary	1500	100	1.0%

Source: Authors estimates based on information provided by the Ministry of Industry.

The economic rationale underlying vertical integration of production is to ensure governance. How would otherwise the producer of final products guarantee that intermediate parts would be available on time and quality?⁹ Vertical integration has contributed to improve reliability of supplies of critical components and has streamlined negotiations regarding cost and price structure of these components; and, in recent times, it has helped maintain continuity of production process and preserve production capacity.

But vertical integration has also helped mask inefficiencies within SOEs with profit making firms cross-subsidizing loss-making firms. A finished product of a firm within a vertically integrated conglomerate is an intermediate product for another member of the conglomerate and its price is, often, not subject to a clear market benchmark. According to procurement law, a tender is not required

⁹ A similar solution happens in market economies when transaction costs are high. See the study on determinants of vertical integration in the US automobile industry by Monteverde Kirk and David J. Teece, 'Supplier Switching Costs and Vertical Integration in the Automobile Industry', The Bell Journal of Economics, Vol. 13, No. 1 (Spring 1982), Pp. 206-213.

if procurement of intermediary products is done within a vertically integrated chain; similarly, according to normative acts, the prices of internally traded goods and services are based on rigid unit costs rather than on market reference prices. Prices cannot be lower than a predetermined unit cost estimate which is typically based on existing cost structure of the enterprise. As such, enterprises with higher excess labor are able to pass these excess labor costs and other inefficiencies along the vertically integrated supply chain. These sources of potential inefficiency are very difficult to offset.

The main reason is that the lack of a competitive environment makes difficult to benchmark manager and firm performance. In the absence of direct market information, significant information asymmetries arise regarding the cost structure and the technologies used by SOEs which ultimately allow manipulating representation of cost structures and shifting the profit centers arbitrarily. Against this background, incentives to improve performance of loss-making firms are considerably blurred.

In the absence of market information benchmarks, all critical aspects of enterprise operation, including the choice of factors of production, output and distribution are directly and indirectly affected by government policies at central, ministerial and local levels. Numerous normative acts at government and sector ministry level specify key aspects of enterprise operation – management of reserves, use of investment funds, and efficient use of spare parts. For example, the Ministry of Industry (MOI) has a special commission that oversees efficient use of energy and other material supplies used by enterprises under its jurisdiction. Another instruction specifies input norms for various production technologies whose purpose is to ensure efficient use of resources in the production process. Formally the state follows a *decentralized management model*, where firms are under the responsibility of relevant sector ministries, even so, in practice there is significant interference and overlapping of responsibility among several ministries.

High degree of government interference has not been solved by the transformation of SOEs into joint stock companies or corporatization. Currently, MOI is the main governmental body that coordinates and regulates the activities of industrial enterprises with a state share. As of 2011, some 164 joint stock companies (JSCs) and 85 unitary enterprises are under economic jurisdiction of the Ministry.¹⁰ In theory, corporatization implies that SOEs are subject to the same laws that govern private corporations and thus greatly improves transparency by separating the accounts of the enterprise from those of the ministry. But in practice, the experience of Belarus and several other countries is that corporatization is not a sufficient condition to insulate the public enterprise from government interference or soft budget constraints (see Annex 1).

On the other hand, strengthening managerial independence of SOEs would beg the question: who controls the managers? This question is complex: as mention before, there is asymmetric information between what the managers know and what the shareholders know. In a market economy, this problem is addressed (but far from solved) through competition and the controls shareholders exert over managers. Second, when firms are state-owned the shareholder is the government, political interference is almost impossible to eradicate. Third, the problem is compounded by the fact that most SOEs are not subject to competition. Fourth, SOEs congregate most of output and, especially employment –hence, SOE’s managerial decisions have direct implication on aggregate employment and output. In China, a very successful reformer, this problem also exists but has been gradually reduced over time through the development of a strong private sector – currently, in nascent stage in Belarus.

¹⁰ According to the Article 113 of Belarus’s Civil Code, unitary enterprises are business entities that have no ownership rights to the assets they use in their operations, this form is possible for state (republican and communal unitary enterprises) and private firms or individuals (private unitary enterprise).

B. Performance of SOEs during the past decade

Relatively good manufacturing asset infrastructure, maintaining traditional economic ties with trading partners and preferential access to Russia allowed Belarus SOEs to reap the benefits of supply channels established during the Soviet times to produce low value added products to export to Russia and other CIS countries. Belarusian SOEs:

- **Inherited several unique USSR economic assets in the manufacturing sector whose utilization was an important source of growth after the breakup of the Soviet Union.** For instance, the automobile and tractor industries manufacturing capacity proved to be competitive in the Russian market; and the chemical and oil processing industries manufacturing capacity which proved to be competitive in the European market.¹¹
- **Maintained traditional economic ties with their main trading partners and helped mitigate a collapse in output at the beginning of the transition.** The breakdown of these economic ties within the former Soviet Union, 'disorganization',¹² is often seen as one of the main reason explaining the collapse of output in industries during the transition from planning to decentralized market conditions. These linkages were especially beneficial to large SOEs like MAZ, Belaz, Minsk Tractor Works and similar other enterprises.
- **Benefited from preferential trade access to the Russia market favoring mainly low value added sectors within the machine building sector.** In 1995, Russia together with Belarus and Kazakhstan made the first steps in forming a customs union. The common external tariff under the recently (re)created Customs Union of the three countries protected the Russian less competitive manufacturing sectors, including the producers of transport equipment, (Table 1.6); but the *umbrella* also protected several Belarusian manufacturing activities. As a result, Belarus transport equipment, and a host of other goods, entered the Russia market free of tariffs and thus had a preference vis-à-vis transport equipment manufactured in the rest of the world.^{13 14}

¹¹ In the period between 1970 and 1989, the value of capital assets in real terms in Belarus grew 4.1 times, compared with 3.4 times average growth in other Soviet Republics. In 1990, the Belarus's total Exports to GDP ratio amounted to 50 percent, far higher than in other Soviet Republics (neighboring Lithuania 37 percent, Ukraine 30 percent and Russia 28 percent).

¹² The term disorganization is used by Blanchard and Kremer to explain the loss of output resulting from the breakdown of relations between producers and users of specialized intermediate inputs that followed the collapse of the Soviet Union. See Blanchard, Olivier and Michael Kremer, 1997, Disorganization, Quarterly Journal of Economics, Vol. 112, No 4, (November 1091-1126).

¹³ Instead Kazakhstan with a much lower manufacturing base was clearly harmed by the common external tariff since it had to divert trade from cheaper sources to Belarus and Russia.

¹⁴ Whether Belarus's economy as a whole benefited from the custom union is another matter. Advantages in the transport sector were partially offset with trade diversion in other areas; tariffs within the transport sector varied depending on value added in the activity (Table 1.6). For example, trucks with Euro4 engine had lower tariff rates than those with Euro3 engines (main product line of KAMAZ and MAZ trucks). A precise assessment of the cost and benefits of the overall arrangement can only be conducted by examining the effective protection implies by the input-output tariff structure. The concept of effective protection measures protection to the value added of an activity. For instance, a zero tariff rate on inputs combined with a 10 percent final product tariff in an activity where value added is 10 percent of the final product cost is equivalent to a 100 percent protection on the value added of the activity.

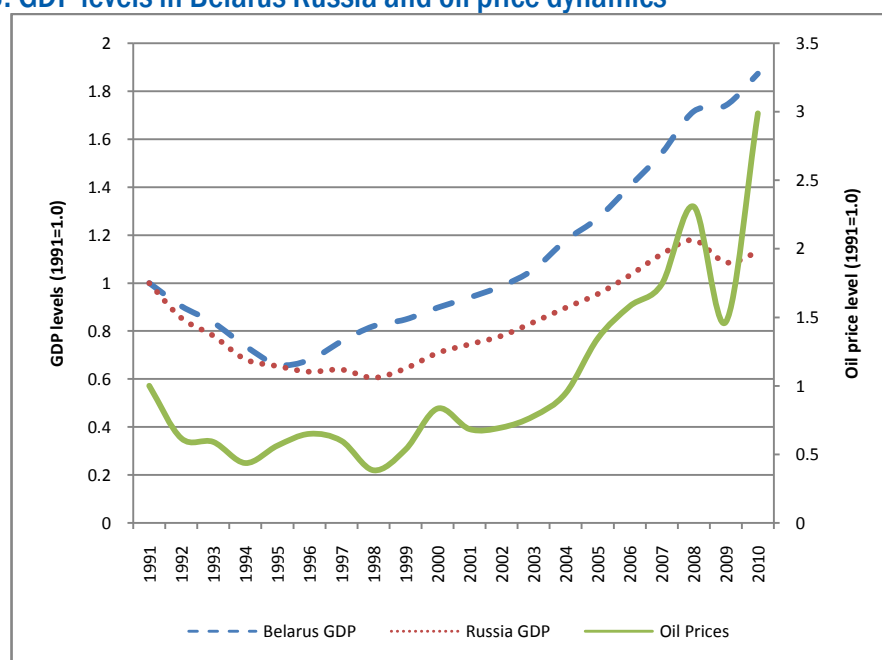
Table 1.6 Select unified tariff rates of Belarus, Kazakhstan and Russia Customs Union

Product category	Tariff rate
Tractor trailers [Euro 2 and Euro 3]	25
Tractor trailers [Euro 4 and above]	5
Tractors (small)	5
Tractors	15
Busses (diesel) > 120 pl	10
Busses > 120 pl	20
Spare parts, components	0-5

Source: unified tariff in effect from July 1, 2011.

Preferential access to the Russia market helped smooth the economic contraction at the beginning of the transition and to benefit from Russia's decade of high growth on the back of favorable external environment and oil price exports (Figure 1.3).¹⁵ In 2008, manufacturing exports¹⁶ to Russia accounted for more than two thirds of Belarus's total manufacturing exports; it fell to less than 50 percent by 2011.

Figure 1.3: GDP levels in Belarus Russia and oil price dynamics



Source: Rosstat, Bloomberg, Authors estimates.

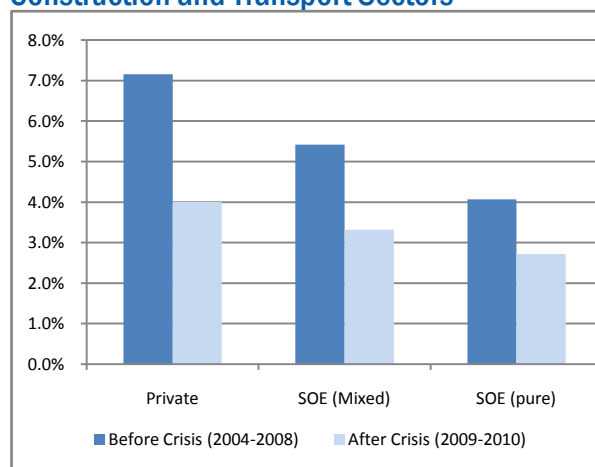
How profitable were SOEs during 1995-2010? Providing an unambiguous answer is extremely difficult because measures of performance based on net revenue (or profits) and value of assets are based on distorted prices and do not reflect true opportunity costs.¹⁷ Little can be done to surmount this problem except for insisting that statistical results ought to be interpreted with pause. With that caveat in mind this section discusses three indicators: the association between average return on assets and ownership; the relationship between loss making enterprises and ownership; and the consistency between aggregate return on capital estimates and profits.

¹⁵ The benefits from preferential access to Russia extended even during the financial crisis as Russia allowed selected Belarus SOEs to benefit from Russian fiscal stimulus measures. In April 2009, Russia included 11 Belarus industrial enterprises (Minsk Tractor Works, MAZ, Gosselmash, Bobrukskagrommas, Belaz, Atlant, Minsk electro technical plant, Belkadr, BaATE, and Minsk Motor Plant) into a preferential list for state procurement.

¹⁶ Groups 5-8, excluding 68 SITC rev.3.

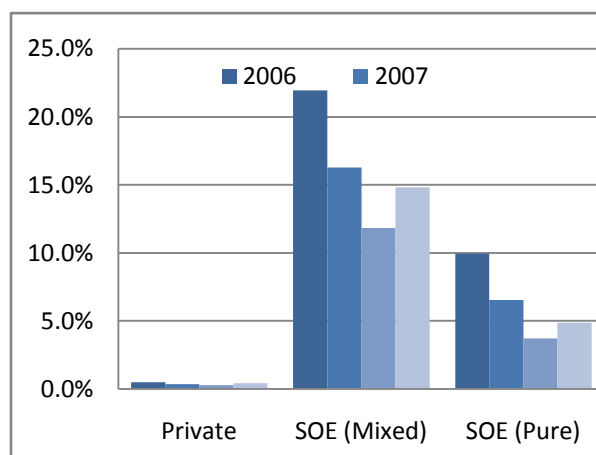
The relationship between average return on assets and ownership (Figure 1.4a) is inverse. This result suggests that private sector ownership is more efficient than government ownership. Even mixed-ownership, SOEs with state participation have on average higher returns on assets. During the crisis, profitability of enterprises decreased, but the inverse relationship between returns and state ownership remained valid.

Figure 1.4a: A relationship between average returns on assets and ownership: Industry, Trade, Construction and Transport Sectors



Source: Authors estimates based on Belstat dataset.

Figure 1.4b: Relative shares of loss-making enterprises (all sectors of economy)



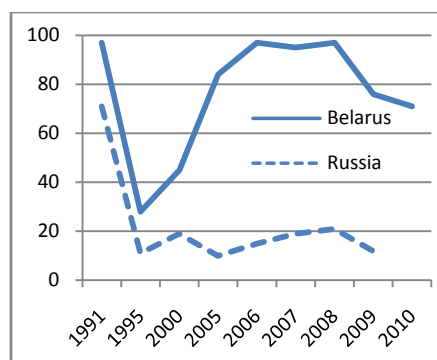
Second, the share of loss-making enterprises in the private sector is significantly lower than that among mixed-ownership or state-owned firms (Figure 1.4b). This fact suggests that if resources allocated to the private sector do not generate income sufficient to recuperate their cost firms do not survive. In contrast, the percentage of loss-making firms among mixed-property or state ownership is fairly large; this suggests that the natural cleansing mechanism of a market economy may be working very slowly or not at all in Belarus. Borrowing from parent companies within a conglomerate, borrowing from state-owned banks or under state guarantees are among the mechanisms that may be making this possible. Notice also (Figure 1.4b) that if there are firms systematically showing losses, capital and labor may be stuck in sectors where revenue cannot cover opportunity cost of factors of production.

C. Recent shifts in demand and supply

Recent shifts in both supply and demand factors imply that the SOE growth model may be exhausted.

On the supply side, the post-soviet industrial structure has not been renovated at a sufficiently fast pace (accumulated depreciation is estimated in excess of 60 percent) which hurts competitiveness in the Russia and CIS market. Excess production capacity in several of the main sectors of the economy was almost exhausted around 2006 (. The absence of new investment and introduction of modern production methods has limited the capacity of Belarus's firms to respond to the increase in demand in the Russia market (Figure 1.5a, 1.5b and 1.5c).

Figure 1.5a: Tractor production utilization rate in Russia and Belarus



Sources: Rosstat, Belstat, World Bank staff estimates.

Figure 1.5b: Tractor production level in Russia and Belarus (1991=1)

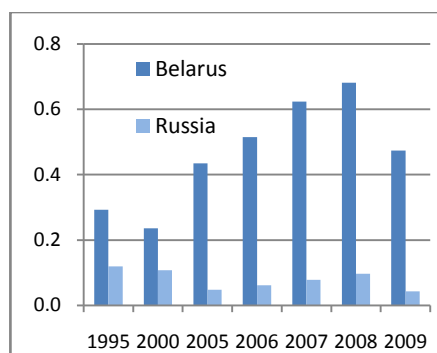
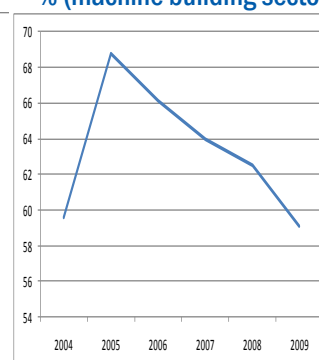
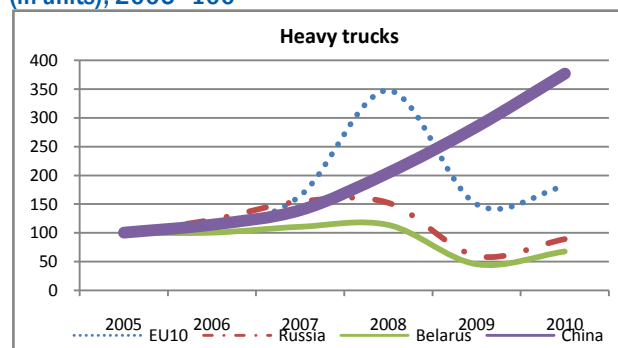


Figure 1.5c: Accumulated depreciation of fixed assets, % (machine building sector)



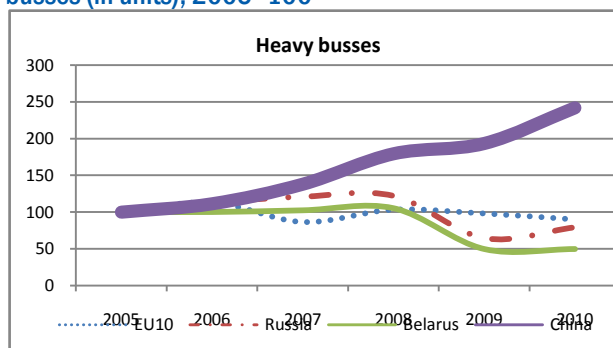
In addition, there has been rapid growth in transport equipment production in Russia and in the penetration of Chinese products in the Russia market. Clearly the twofold increase in heavy truck and bus production in China in the past five years (Figure 1.6a and 1.6b) dwarfs the relevance of Belarus's transport equipment production.

Figure 1.6a Normalized production levels of heavy trucks (in units), 2005=100



Source: Organization of Motor Vehicle Manufacturers, www.oica.net

Figure 1.6b Normalized production levels of heavy busses (in units), 2005=100



The increase in wages and the price of electricity and gas has also contributed to the erosion of the cost advantages of Belarus's enterprises. A privileged access to underpriced Russian energy supply has been greatly reduced with scheduled tariff increases (Table 1.7 and Figure 1.7a).¹⁸ Moreover, the unit labor costs in Belarus have become higher than in Russia (Figure 1.7b).

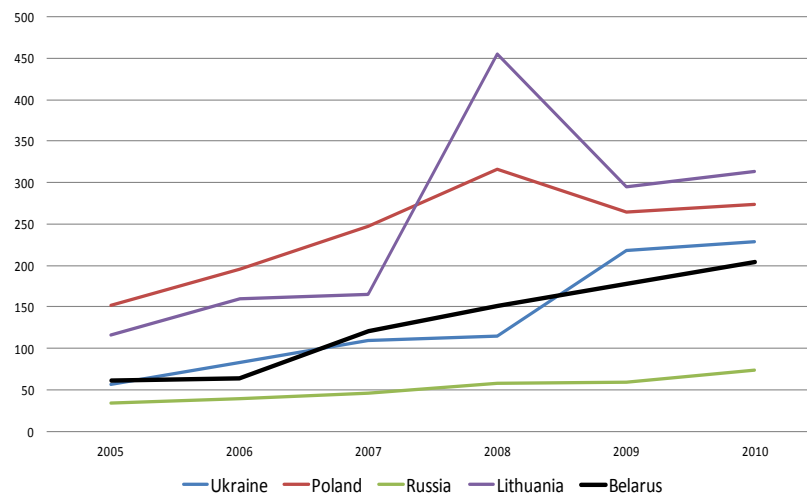
Table 1.7: Average cost of electricity for industry (USD/kWh)

	2005	2006	2007	2008	2009	2010
Russia	\$0.03	\$0.03	\$0.04	\$0.05	\$0.05	\$0.05
Belarus	\$0.05	\$0.07	\$0.09	\$0.11	\$0.11	\$0.13

Sources: Russia - Rosstat, Belarus - Ministry of Energy.
Memorandum: Converted using average local currency unit to US\$ exchange rates.

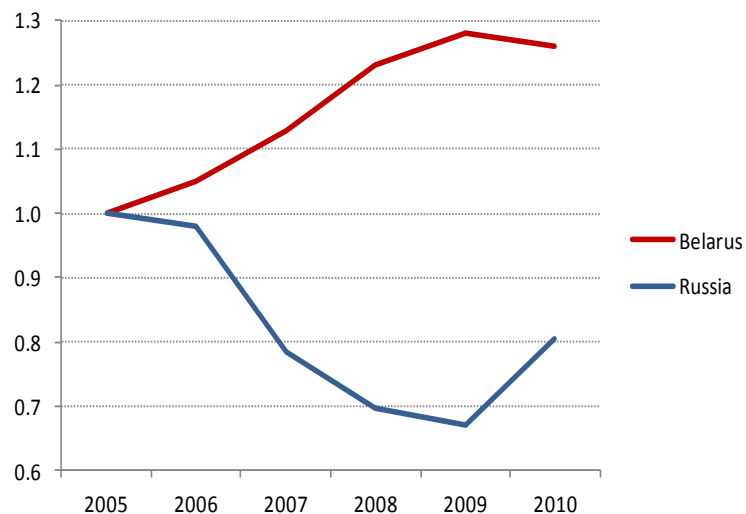
¹⁸ The recent (November 2011) gas agreement with Russia secures privileged gas import price for Belarus for 2012-2014 postponing but not cancelling an inevitable tariff increase in line with increase in Russian domestic tariffs.

Figure 1.7a: Natural Gas Non-residential Tariffs, US\$/TCM



Source: Energy Regulators Regional Association (ERRA), Ministry of Energy of the Republic of Belarus.

Figure 1.7b: ULC dynamics: Russian manufacturing and Belarusian industry (2005=1)



Source: World Bank staff calculations on Belstat and Rosstat data.
Notes: Based on the producer price index as wage deflator.

On the demand side, there has been an increase in demand for more sophisticated products in the Russian market. The evolution of the Russian market suggests that there is a high income elasticity of demand for quality transport equipment. To the extent that Belarus does not compete in this market its industry is bound to lose market share.

The combined effect of supply and demand shifts has been a sharp decline in the market share of Belarusian machinery and transport imports in total imports of Russia during the last years (see Figure 1.8a, 1.8b and 1.8c).

Figure 1.8a: Evolution in the share of Belarusian exports to Russia in the global exports to Russia, specific machinery goods (in units), % total

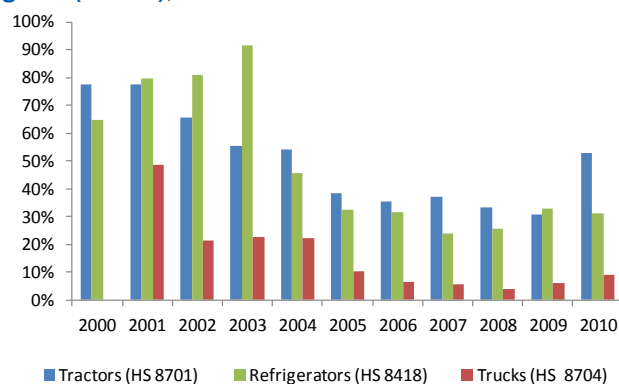


Figure 1.8b: Belarus's market share in total imports into Russia, %

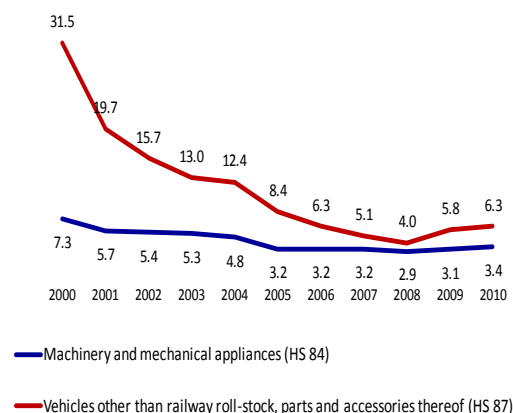
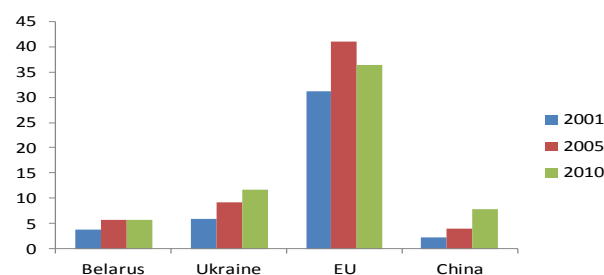


Figure 1.8c: Share of various trade partners in the global machinery exports to Russia, 2001, 2005 and 2010, % total



Source: World Bank staff calculations on WITS/UN COMTRADE data.

The decline in the market share illustrates the difficulties faced by Belarus companies' to maintain their participation in the expanding Russian market. In the heavy truck segment, Belarus's sales to Russia were stagnant for the second part of 2000s, despite the fact that Russian market for heavy trucks was growing on average by 11 percent per year between 2000 and 2008. Demand for more sophisticated products in Russia has increased. This demand cannot be served by Belarus more traditional product lines, and instead has been filled by imports of western-made higher quality trucks (see Table 1.9 and Figure 1.9).

Table 1.9: Heavy truck sales in Russia

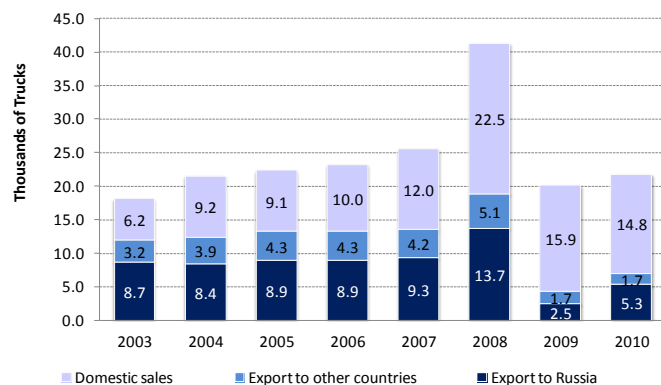
	1995	2000	2005	2006	2007	2008	2009
Units ('000 trucks)							
Total Sales	129.2	190.3	205.9	256.6	366.9	360.5	102.0
Russian producers	119.1	171.1	155.8	193.2	230.3	211.3	76.1
CIS producers	5.8	11.5	9.6	10.3	11.6	9.2	2.2
Non-CIS producers	4.3	7.7	40.5	53.1	125	140	23.7
Market shares (% of total)							
Russian producers	92.2%	89.9%	75.7%	75.3%	62.8%	58.6%	74.6%
CIS producers	4.5%	6.0%	4.7%	4.0%	3.2%	2.6%	2.2%
Non-CIS producers	3.3%	4.0%	19.7%	20.7%	34.1%	38.8%	23.2%

Source: Rosstat, Authors estimates.

In contrast, there has been a rapid increase in the importance of the domestic market. Between 2003 and 2007, domestic sales nearly doubled while exports of tractors to Russia and other countries stayed broadly constant; in addition, during the global financial crisis of 2008-2009, the domestic market became the main sales channel for Belarus's trucks (Figure 1.8). Public procurement, as a part of agriculture modernization program, contributed to the increase in domestic demand. Even after substantial recovery in track sales to Russia in 2010, domestic market accounted for two thirds of total sales as compared to only one third in 2003.

But the increase in importance of the domestic market is not sustainable. It is based on protectionism which limits competition with other possible sources and has been financed by spending policies followed by the Government of Belarus that are not sustainable given the current macroeconomic situation.

Figure 1.9: Sales of Trucks 2003-2010



Source: Belstat, Authors estimates.

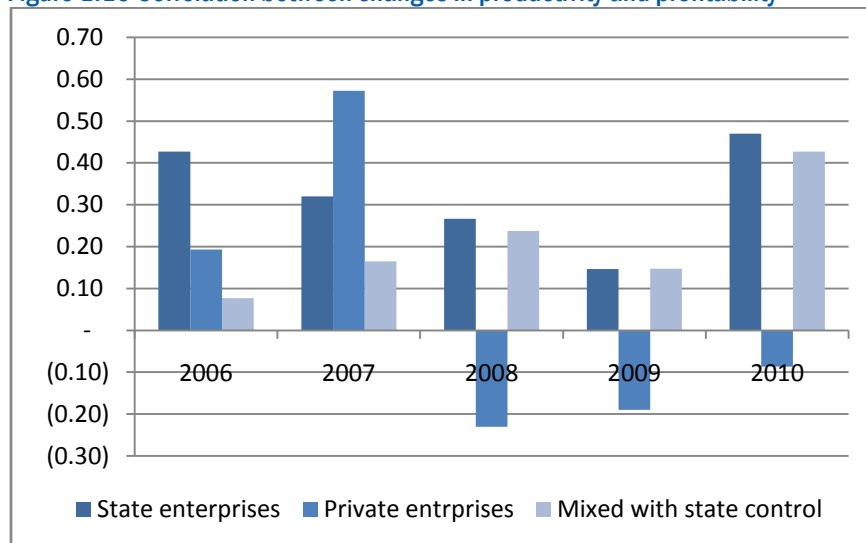
In sum, the period of high growth in recent years has come to an end unless SOEs adapt to the radical changes in the external and domestic environment. Excess capacity, which easily contributed to rapid growth in productivity, is already exhausted; low investment in improving quality of products along with rapidly increasing real wages has reduced competitiveness. The biggest challenge looking forward is to respond to the changes that will result from Russia's accession into the WTO and from the gradual increase in consumer's sophistication in that market.

D. Capacity of SOEs to adapt to structural changes

Can Belarus' SOEs adapt to the challenges of facing more competition in export markets as well as in the domestic economy? Two facts shed doubts about SOEs capacity to adapt: (i) the response of production to fall in demand during 2008-2009, and (ii) slow technological innovation. Neither of these facts is proof of the impossibility of SOEs to adapt, but each illustrates the difficulties to do so in the face of critical shifts in market conditions.

The response of private firm production to the fall in demand in 2008-2009 was markedly different than that of SOEs. Figure 1.10 documents this fact. For private firms there is a negative correlation between profits and productivity, for SOEs this correlation is positive. While a fall in demand results in lower sales and a fall in profits for either of the two groups, private firms shed labor and capital resources and cut production therefore rising productivity (hence the positive correlation);¹⁹ at the same time, SOEs do not shed labor and hence productivity falls at the same time that profits fall (hence the negative correlation).

Figure 1.10 Correlation between changes in productivity and profitability



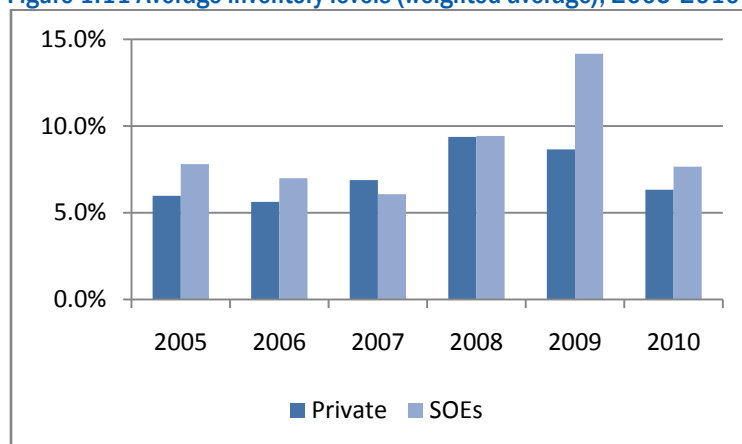
Source: Authors estimates based on the NBRB dataset.

Why did SOEs respond so slowly to the fall in demand of 2008? The short answer is that **management of SOEs is required to meet a variety of quantitative targets rather than only a financial bottom line.**²⁰ As a result, SOEs did not cut supply sufficiently, accumulated inventories (which increased about 50% between 2008 and 2009, Figure 1.11), and increased their debt to banks (see the evolution of SOEs debts in the third line of Table 1.3). This was especially the case for those SOEs where exports are a high share of sales. Government policy was aimed to mitigate the negative consequences of enterprise adjustment during the crisis, but such policy may have merely postponed the adjustment of production.

¹⁹ The reason this is true is that there are decreasing returns to scale in production. This implies that shedding labor results in an increase in productivity of those employed.

²⁰ While it is admittedly simplistic to assume that managers of private firms only pay attention to the bottom line or financial result before they adopt employment decisions it is clear that the room for maneuvering they have is way smaller than that of a firm less constrained by their financiers.

Figure 1.11 Average inventory levels (weighted average), 2005-2010

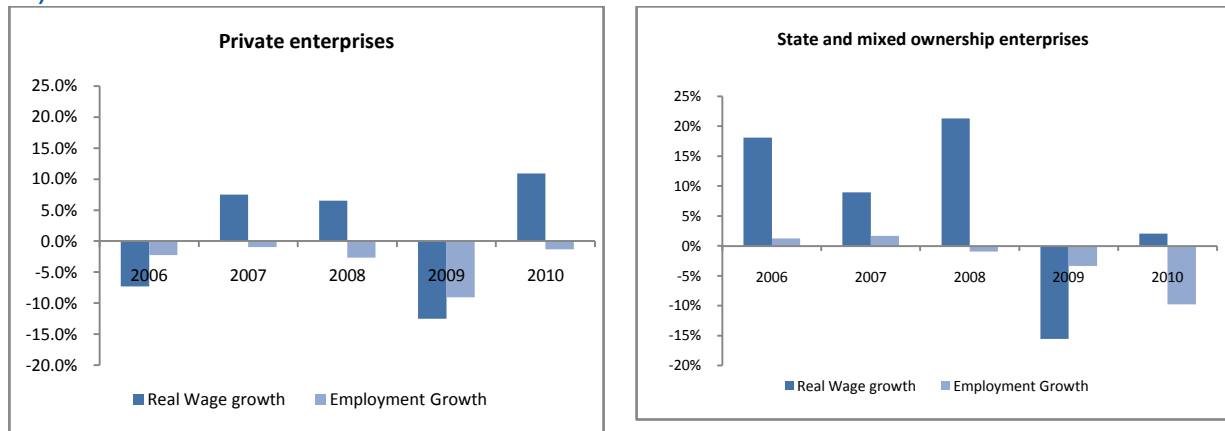


Source: Authors estimates based on the NBRB dataset.

But there is a longer answer to this question which is important to discuss in view of the current situation of the economy. SOEs were then (and now) under enormous pressure to minimize the negative social impact of the crisis. In the absence of an independent social safety net, SOEs perform the role of social insurers of last resort providing de facto income transfers to their employees during a recession. While this is understandable it is also extremely costly and, in the jargon of economists, sub-optimal. It is understandable because many of the poor performing enterprises are located in mono-company towns where they are the single largest employer. Cutting labor in these towns was bound to have a very high cost in terms of unemployment. Even relatively successful companies such as MAZ were pressured to take over other poorly managed enterprises, effectively bailing them out. At the same time, making SOEs perform this function is extremely costly and sub-optimal. What sense does it make to continue producing when there is no demand? A far better alternative would be to pay directly to the employees and save in the raw materials and intermediate products used in production. It is also sub-optimal because the firm affected by a negative shock is the insurer, which clearly does not allow spreading risks in a larger society pool.

This does not mean that SOEs remained immobile to market changes: in fact they reduced number of hours of work, cut bonuses etc. and imposed wage cuts about three times larger than private enterprises (see Figure 1.12). It just means that the adjustment in employment was significantly smaller in SOEs than in private enterprises (which shed about 10 percent of their employment in 2009).

Figure 1.12 Real Wage and employment growth in private and state enterprises in machine building sector (2006-2010)



Source: Authors estimates based on the NBRB dataset.

The second fact is the slow technological upgrade of production plants and adoption of organizational practices similar to those introduced in the transport equipment sector in other countries during the past decade. Slow change has harmed capacity to meet increasing competition from China in traditional product lines and made impossible to move forward and compete in the higher quality market segment.

Slow technological change is, at least in part, the result of an incentive system that does not foster innovation. First, SOEs cannot appropriate the results from an innovation increasing their net revenue; their managers may benefit in part from successful innovations but bear the cost of unsuccessful ones. Second, and most relevant for the transport equipment sector, FDI inflows remain low. FDI could enhance growth and competitiveness of the host economy not only through the adoption of new technologies in the production process, but also through knowledge transfers, both in terms of labor training and skill acquisition and by introducing alternative management practices and better organizational arrangements. This reality contrasts with the experience of other Eastern and Central European countries which were able to upgrade their industrial enterprises through privatization and attracting foreign direct investment. For instance, in Czech Republic, a sale of Skoda to VW group gave access to modern technologies and know-how. Against this background, the likelihood of the Innovation fund (Box 2) to be the source of financing of cost reducing innovations is very low: as structured, it operates more as a tax on firms than as a source of financing of new technological and organizational innovations.

Box 2 Does Innovation fund result in more innovations?

The practice of establishing Innovation Funds is rooted in Soviet times. The Innovation Funds existed as off-budget funds prior 2005 and were incorporated into the budget as an earmarked budget funds afterwards. At present, there are more than three dozen innovation funds in Belarus, managed by either line ministries/concerns or by local authorities.

Stipulated by the Presidential Decree #596 from December 7, 2009, the Innovation Funds are financed by levies at the rate of up to 0.25 percent from the costs of goods, works and services. All SOEs or companies with a state stake are taxed. The same Decree sets the right to establish increased norms of allocations to Innovation Funds for certain republican state bodies and other state organizations subordinated to the national and regional governments (up to 19 percent for Ministry of Energy and Ministry of Transport and Communications). In 2010, revenues of innovations funds accounted for 1.3 percent of GDP.

In addition to the general argument of budget integrity and the strategic prioritization of budget resources, which are undermined by the earmarking of budget resources, contributions to innovation funds remain the most distortionary and investment-unfriendly features of the tax system in Belarus. The innovation taxes are the last remaining turnover tax in Belarus. The innovation taxes, in particular their variable rates, distort the allocation of resources and the composition of final output.

The continued existence of the Innovation Funds is explained by the fact that line ministries and state organizations view the earmarking of these funds as a way to ensure a minimum level of investments and implement sectoral and regional innovation and energy efficiency programs. However, it is impossible to access whether the Innovation Funds indeed engender more innovation or are simply used as a tool for covering operational expenses of the respective government agency. Their spending is neither driven by the contributors' demand for a certain services, nor linked to particular development outcomes.

E. Looking forward

Expansion of the private sector is critical to facilitate reform in the public sector enterprises. Reforms that have short-term costs as a result of downsizing are easier to adopt and implement if the private sector is thriving than if it is anemic. The experience of China in this respect is important (see Annex 2).

Submit SOEs to a market valuation exercise. The net worth of SOEs is the present discounted value of revenues minus costs. Revenues can be divided in domestic and external ones: domestic revenues should be adjusted at international prices so as to avoid attaching an economic value to prices that only depend on lack of competition; external revenues should be based on a projection of trends in prices and quantities in the main markets. What are the prospects of the Russia market? What happens if Russian industrial policy changes? To the extent that Belarus is hostage to policy changes in one market very careful discounting of the value of future projected flows is necessary; but market hostage situations can also be dealt with by agreements or strategic investments that provide incentives to discourage drastic changes in policy in the client markets.²¹ Costs should be based on economic calculus: energy, other tradable inputs, and credit should be priced at market value. Excess labor should be identified and priced at zero opportunity cost.²² Detailed analysis of production costs is necessary to identify lines to be discontinued and necessary reforms; this will lead to cut inefficient product lines and thus reduce the cost of cross-subsidization.

Break down SOEs and allow for more decentralized decision making. Review critically when is vertical integration economically justified and when is it used to hide inefficiency. It is understandable that vertical integration may govern the sourcing of several inputs in the manufacturing production process, it is also difficult to justify why other inputs and services are not outsourced. In fact, outsourcing several of these services may contribute to gradually develop the strength of the private sector. A useful guide as to what could be outsourced and offshored would be to examine changes in the organization of production in the transport equipment sector in other countries (and comparing them with the evolution of the industry in Belarus). Establish an exit strategy respect to tasks and activities identified as possible to outsource and act upon them. This will admittedly reduce control over the performance of managers but may simplify considerably the design of reforms ahead. Currently there is no information base to decide that there some production units are competitive and some others are loss making.

More competition is critical to increase discipline of operation of the SOEs. This is in the same line as the previous point: market discipline would provide useful information to guide MOI's policies. Several steps could be implemented immediately:

- Submit SOEs to same credit, tax and procurement norms as apply to private corporations.
- Recognize that resources have alternative uses and, therefore, should be priced accordingly regardless of who is the owner of the enterprise. In particular pricing energy, credit and labor at their opportunity cost is critical.

²¹ A useful analogue of the type of problem to be examined is the analysis of the relationship between General Motors, the American automobile company and Fischer Body, a specialized supplier (Hart, Oliver, 1995, *Firms, Contracts and Financial Structure*, Clarendon Lectures in Economics, Clarendon Press Oxford). The GM-Fisher relationship shows the difficulties of possible holdup situations and examines the cost and benefits of different contractual solutions.

²² The shadow price of labor is never zero; even so, it may be zero for a firm who is forced to keep in its payroll workers whose marginal product is zero.

Inviting foreign direct investment in SOEs may also contribute to discipline their performance as well as provide access to new technology and resources.

Establish an emergency unemployment insurance system. Separating the functions of SOEs as production units from their functions as part of the social safety net is imperative. In the absence of such a system SOEs reform will be delayed and biased by employment realities.

Gradual reform is better than shock reform, no reform is worse. This is a contentious issue: gradualism is often an excuse to delay reform; on the other hand, shock reform (dismantling a whole structure of enterprises in the expectation that factors of production would be automatically deployed to more efficient uses) under current circumstances will probably result in implosion and massive loss of value and could carry with large costs. If there is a visible opportunity cost to factors of production currently allocated in the sector then the cost of transitory unemployment would be bearable; but if the opportunity cost of these resources is very low then forcing a rapid restructuring would be very costly. Be cognizant that no reform will imply the gradual collapse of the transport equipment sector.

Be cognizant that government direct support to SOEs will decline sharply in the future (hardening of budget constraints). The overall financial capacity of the government to continue subsidizing the sector will fall sharply. There is still considerable protection through (i) favoring domestic and state owned companies in procurement, (ii) support in establishing distribution channels abroad, and (iii) limiting market access to foreign competitors in domestic market.

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