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**MACHINEBUILDING OF UKRAINE:
TRENDS OF MODERN DEVELOPMENT**

In the article the current state of Ukrainian machine-building complex – one of the leading ones in the national economy of our country is investigated. Ways of improving its development are offered.

Key words: engineering sector, the global economic crisis, the high-end manufacturing, investment.

The problem statement. The Machine-building is of great importance to the consolidation of the economy of Ukraine and its formation as an independent and highly developed state. “The economic miracle” of Germany, Japan, South Korea and other countries began with the development of their modern industries. Machine-building is one of the leading units of heavy industry. Building the most active part of the basic manufacturing fixed assets, the machine-building sector greatly influences the rate and directions of scientific and technological advance in different sectors of national economy, the labour productivity increase and other economical activities, determining the effectiveness of the development of social production.

The role of the machine-building in the development of the country is determined by its function of serving in all the cross-industry complexes such as fuel, agroindustrial, construction etc. It is also determined by its participation in the territorial division of labor (both domestic and inter-state). It is the share of engineering production in the export sector that the status of the country and its place in the international economic integration process greatly depends upon. The engineering sector of Ukraine plays a particularly great role in the economic integration of the states of the former USSR. For example, in 1990 Ukraine produced 95-100% of the bucket wheel excavators, coal, corn, beet-harvesters, 40% of the blast furnace and steelmaking equipment, almost 50% of the power transformers, 30% of the excavators etc.

The analysis of the latest investigations and publications. The basic standard act, which determines the policy of the state and the activity of the subjects of management in the machine-building sphere, is the Law of Ukraine «On Stimulation of domestic machinery for agriculture» [3]. The scientists Averchenkov V., M. Arshansky, Alexeyev, V. Heyets, B. Granovsky, Mr. Granovsky, O. Gorlenko Piriashvili B., D. Prager, W. Smolyan, V. Starks, V. Shvets etc. made a great contribution to the solution of the problem of reducing the cost of production at the manufacturing stage and the analysis of the quality of products.

Singling out unsolved parts of the common problem. Since 2000 the engineering has developed at a steady pace and there has been a positive trend of growth. The largest volume of production was achieved in 2008, it accounted

for nearly 64 billion UAH. The exports of engineering products were 27 billion UAH. The global economic crisis had a negative impact on the industry - in 2009 production decreased by 58%. This especially affected the automotive, heavy and transport machinery, the share of which in the structure of production is the largest.

Analyzing the rates of development of machine-building, one can note that the tendency of improving enterprise performance and their way out of the crisis has revealed itself. The rates of production development in the industry – are almost the highest. From January to September 2010 General Engineering enterprises produced commercial output to the amount of 29.4 bln UAH, which is 160% against the same period last year [1].

Table 1

**Volumes of distribution of the machine-building production of Ukraine
from 2009 to 2011, mln USD**

	2006	2007	2008	2009	2010	2011	2011 to 2006, %
Machinery and equipment	4440	5960	7366	4402	5016	6070	136,71
Electrical, electronic and optical equipment	3071	4201	5055	3150	3494	4323	140,76
Transport facilities and Equipment	6098	9311	11646	3481	6162	8977	147,21
Machine-building	13610	19473	24067	11033	14672	19370	142,32

Compiled by the authors on the information given in [2]

By the end of 2011, there is an increase in volumes of production of machine-building in each of the industries (table 1). Particularly the volumes of realization of transport facilities and equipment increased by 47.2%, electrical equipment – by 40.7%, machines – by 36.7% compared with 2006. This tendency is conditioned by high demand for the production of this sector in the CIS countries. Thus, the exports of machines, equipment, machinery and electrical equipment from January to July 2012 increased by 7.5%, and the transport - by 27.4% compared to the same period of 2011 [4].

One can observe a tendency to increase part of profitable enterprises of machine-building sector among all industrial works. Thus, according to the State Statistics Committee, from January to June 2012, the increase was 3.9%. But, the quantity of loss-making enterprises in this sector still at a high level - 38.8% [2].

In spite of the increase of the volumes of sold production the share of machine-building in the industrial sector of the economy of Ukraine from January to August 2012 amounted to 12.2%. This indicates a low level of development of the industry, as in highly developed countries the share of machine-building accounts for 30 to 50% of industrial production. [3]

The objective of the article is the ground of conceptual suggestions to improve the development of the leading complex of the national economy of Ukraine that is engineering.

Setting out the basic material. The machine-building complex of Ukraine covers more than 20 specialized sectors. In our country this complex is one of the most developed. From 1940 to 1990 its volume of production increased 95 times. Since the end of the 70s machine-building has become the leading industrial sector. It accounts for over 40% of the total industrial production potential of industrial production. The share of the production of the complex in the total industrial output is 12%, and in the volume of the it is GDP - 7%. For example, in developed countries the share of machine-building production account for 30 to 50% of the total industrial production (in Germany it is 53.6%, in Japan - 51.5%, in the UK - 39.6%, in Italy - 36.4 % and in China - 35.2%) [5].

At present, the study complex under consideration brings together more than 11 thousand enterprises. Its share in the Ukrainian GDP at the end of 2011 was 12%. The machine-building enterprises are concentrated geographically in all the regions of Ukraine. However, eight largest cities engaged in engineering - Kharkov, Kiev, Dnepropetrovsk, Zaporozhye, Odessa, Lviv, Donetsk and Lugansk – stand out particularly brightly on this background.

According to the orientation toward the market of products manufactured by enterprises of machine-building industry, they can be divided into the following groups:

- heavy engineering - its development is determined, first of all, by the investment activity of metallurgical, construction, energy and transport sectors;

- tractor and agricultural machine-building is highly dependent on the financial responsibility of agricultural producers and processors of agricultural products, as well as, partially, on the demand of the population;

- railway machine-building – is directed at meeting the demand on the part of the railway industry;

- automotive industry is focused on the end-user demand (car production), as well as on the need of enterprises, firms, and the executive branch (the production of trucks and buses);

- Electrical, engineering, instrument – making and machine-tool construction are a group of all high-tech industries, developing after the needs of other industries, including the self engineering itself in general.

The main advantages of mechanical engineering are:

- Growing demand for power engineering production (turbines, compressors, generators, transformers), aircraft engines, space and military equipment, carriages and cable products;

- The development of new seller's markets in India, China, the EU and Latin America;

- Competitive price-quality ratio for the products of machine-building industry;

- High scientific and production potential of enterprises.

Because of the world economical crisis in December 2012 the index of industrial production decreased by 7.4%, while in 2012 the drop was 1.8%. Metallurgical and machine-building complexes slowed down, by 5.2% and 6% respectively, and the production of coke and refined petroleum products un-

derwent the biggest decrease – by 26.4%.

It became more difficult for Ukrainian manufacturers to work off their products abroad. Competition continue to increase due to the global oversupply of iron ore and steel, especially in China.

At present in machine-building of Ukraine there are a number of problems, and the main ones are as follows:

- Wear and tear of the basic industrial funds by 70%;
- disability to work out, create and launch new products to mass production independently;
- low effectiveness of production;
- Outdated and non-competitive products;
- The absence of high value added industries and high-tech;
- The absence of well-grounded scientific and technological foundation;
- Lack of investment in the sector (see Table 2);
- Almost complete focus on the markets of the former Soviet Union States;
- A critical dependence on Russian components;
- Shortage of skilled workers, engineers and managers.

As we see in table 2, the basic country investing in the sector is Cyprus. But it should be noted, that the basic capital inflow to our country is realized by Ukrainian companies, registered in this offshore zone. Therefore it can rather be called reinvestment.

Table 2

Foreign direct investment to the engineering sector of Ukraine, mln USD

	1 half year of 2011	Share, %	1 half year of 2012 г.	Share, %
Cyprus	238,8	33,8	246,1	37,6
Germany	123,0	17,4	101,7	15,5
Austria	45,7	6,5	88,7	13,6
Great Britain	150,3	21,3	57,2	8,7
Russia	81,0	11,5	79,0	12,1
France	25,3	3,6	31,5	4,8
Sweden	42,9	6,1	50,1	7,7
USA	59,0	7,7	-	-
Altogether	707,0	100,0	654,3	100,0

Source: [2]

The reduction of Ukrainian machine-building is accompanied by its scientific and technological degradation which is also very rapid. Scientific research in the Ukrainian engineering is actually not conducted. For example, in the United States an average of 2-2.3% of GDP is spent on research in the field of mechanical engineering every year; in the European Union - about 3% of the GDP, and in our country, this figure is estimated at 0.1% of the GDP [1].

The problems of the development of machine-building are straight connected with the strategy of the economic development of the country. First of all, it is the increase the efficiency of the engineering itself by:

- Restructuring the industry with an increase of high-tech enterprises;
- The creation of modern technological equipment for all the branches of mechanical engineering in order to reduce energy, resource and labor intensity of production and improve the competitiveness of its products;
- Ecological measures take in production which provide for output of resource-saving and environmental types of technology.

Conclusions. To stimulate the development of machine-building enterprises and to increase the effectiveness of their operation it is advisable to take the following measures:

1. The restructuring of the industry with the involvement of high-tech productions.
2. Creating a favorable investment climate and attracting foreign investment in the development of the complex.
3. Training and re-training of highly qualified specialists.
4. The initiation of the renewal of the range of products and of high-tech equipment .
5. The planned establishment of cost- based tariffs that will encourage cost reduction in production.
6. The orientation of the products to the standards of developed countries to enter the global market.
7. Creating closed cycles of production within the country.
8. The involvement of the leading research institutes of the country to prepare the industry development strategy until 2020.

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**МАШИНОСТРОИТЕЛЬНЫЙ КОМПЛЕКС УКРАИНЫ:
ТЕНДЕНЦИИ СОВРЕМЕННОГО РАЗВИТИЯ**

Резюме

В статье исследовано современное состояние машиностроительного комплекса Украины – одного из ведущих в национальной экономике нашей страны. Предложены пути совершенствования его развития.

Ключевые слова: машиностроительный комплекс, мировой экономический кризис, наукоемкие производства, инвестирование.

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**МАШИНОБУДІВНИЙ КОМПЛЕКС УКРАЇНИ:
ТЕНДЕНЦІЇ СУЧАСНОГО РОЗВИТКУ**

Резюме

У статті досліджено сучасний стан машинобудівельного комплексу України – одного з провідних в національній економіці нашої країни. Запропоновані шляхи вдосконалення його розвитку.

Ключові слова: машинобудівельний комплекс, світова економічна криза, наукоемні виробництва, інвестування.