

FOREIGN ECONOMIC ACTIVITY AND FINANCIAL RESULTS OF MACHINE-BUILDING ENTERPRISES OF UKRAINE *

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Vlasova N. A., Chekmasova I. A. Foreign Economic Activity and Financial Results of Machine-Building Enterprises of Ukraine

The aim of the article is to study the interrelationships between indicators of foreign economic activity and financial results of machine-building enterprises at the current stage of development. The analysis of statistical reports related to series of two groups of indicators for 2005–2015 is carried out. The first group describing financial results includes the following indicators: volumes of sales, financial results before taxes, net income, return on operating activities. The second group characterizing the foreign economic activity includes the indicators of foreign direct investments, exports and imports, trade balance, share of exports in the total sales and the official average annual exchange rate of the national currency. Particular stages of interrelated trends of changes in the indicators in dynamics are determined. The degree of closeness of interrelationships between factor and result indicators is assessed by correlation analysis. Current interdependent problems associated with the development of foreign economic activity and financial soundness of the machine-building enterprises of Ukraine are revealed.

Keywords: financial results, net income, exports, imports, foreign investment, exchange rate, engineering industry.

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Власова Н. О., Чекмасова І. А. Зовнішньоекономічна діяльність та фінансові результати машинобудівних підприємств України

Метою статті є дослідження взаємозв'язку між показниками зовнішньоекономічної діяльності та фінансовими результатами машинобудівних підприємств на сучасному етапі розвитку. Проведено аналіз статистичної звітності за 2005–2015 рр. динамічних рядів двох груп показників. Перша група, що характеризує фінансові результати, включає: обсяг реалізованої продукції, фінансові результати до оподаткування, чистий прибуток, рентабельність операційної діяльності. Друга, що характеризує зовнішньоекономічну діяльність, включає: прямі іноземні інвестиції, розміри експорту та імпорту, сальдо експорту та імпорту, питому вагу експорту в загальному обсязі реалізованої продукції та офіційний середньорічний курс гривні. Виокремлено етапи взаємопов'язаних тенденцій змінення даних груп показників у динаміці. Виконано кореляційний аналіз, що дозволив оцінити щільність зв'язку між факторними та результативними параметрами. Виявлені сучасні взаємозалежні проблеми забезпечення фінансового благополуччя та розвитку зовнішньоекономічної діяльності підприємств машинобудування.

Ключові слова: фінансові результати, чистий прибуток, експорт, імпорт, іноземні інвестиції, курс валют, машинобудування.

Табл.: 4. **Бібл.:** 13.

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Власова Н. А., Чекмасова И. А. Внешнеэкономическая деятельность и финансовые результаты машиностроительных предприятий Украины

Целью статьи является исследование взаимосвязи между показателями внешнеэкономической деятельности и финансовыми результатами машиностроительных предприятий на современном этапе развития. Проведен анализ статистической отчетности за 2005–2015 гг. динамических рядов двух групп показателей. Первая группа, характеризующая финансовые результаты, включает: объем реализованной продукции, финансовые результаты до налогообложения, чистую прибыль, рентабельность операционной деятельности. Вторая, характеризующая внешнеэкономическую деятельность, включает: прямые иностранные инвестиции, размеры экспорта и импорта, сальдо экспорта и импорта, удельный вес экспорта в общем объеме реализованной продукции и официальный среднегодовой курс гривны. Выделены отдельные этапы взаимосвязанных тенденций изменения данных групп показателей в динамике. Выполнен корреляционный анализ, позволивший оценить тесноту связи между факторными и результативными параметрами. Выявлены современные взаимозависимые проблемы обеспечения финансового благополучия и развития внешнеэкономической деятельности предприятий машиностроения.

Ключевые слова: финансовые результаты, чистая прибыль, экспорт, импорт, иностранные инвестиции, курс валют, машиностроение.

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The state and development level of engineering in any country determines not only its technical potential but is essential for implementation of strategic objectives in all major sectors of the national economy playing

a key role in ensuring the competitiveness of domestic producers both in the domestic and foreign markets. Machine building, as a complex of nearly 20 specialized industries, produces capital goods. Its production includes a wide range of various types of machinery and equipment, vehicles, electrical equipment, electronic products, computers, etc.

At the end of the last century Ukraine was a country with a high level of industrialization. In 1990 the specific weight of the machine-building industry amounted to 30% of the total volume of industrial production. Due to various objective and subjective factors during the following years its share in the industrial output of the national economy was declining steadily. Today this figure does not reach 10% even with consideration to the general decline in industrial production whereas in countries with developed economy this indicator ranges from 30% to 55% [1] providing a sound basis for steady technical modernization of the industry every 8–10 years.

The critical state of the Ukrainian engineering is caused by the consequences of breaking the connections of a single machine-building complex of the former USSR. The global consequences of the world financial and economic crises both in 1998 and 2008 had a significant negative influence on the sector. There also should be noted miscalculations in the government economic policy and the internal crisis in the industry: lack of technical re-equipment and modern restructuring; a high level of deterioration of the material and technical base; low funding and, accordingly, low investment activity in the industry and some others. The main indicators of financial and economic activity of machine-building enterprises in Ukraine during the last decade show that the industry as a whole has been stagnating with a significant drop in physical volumes of production and sales as well as with a sizable decline in the financial results. The greatest concern is caused by financial losses of machine-building enterprises in Ukraine in 2014 and 2015, which accounted for 22.0 bln. UAH and 16.0 bln. UAH, respectively [2; 3].

Financial results of any enterprise are formed by a multiple factor system that includes indicators characterizing the functional area of the business activity and environment. Traditionally the foreign economic activity related to export-import transactions and foreign direct investments plays a key role in the total activity of the enterprises in the machine-building industry, which undoubtedly has a significant effect on the level of their financial results and profitability.

Theoretical and methodological issues of development of foreign economic activity and evaluation of its effectiveness are the subject of research for domestic and foreign academic economists: T. P. Gytis, I. N. Mayer, D. V. Malashchuk, Y. U. Makogon, B. M. Danylyshyn, V. P. Babich and others [1; 4–9]. However, despite a fairly large number of studies in the field of export-import transactions, the issues of interrelationships between indicators of foreign economic activity and financial results of enterprises are not highlighted enough. Therefore, the study and analysis of the impact of foreign economic activity indicators on financial results of enterprises are urgent nowadays.

The aim of the article is to study the interrelationships between indicators of foreign economic activity and financial results of machine-building enterprises at the current stage of development.

The research of interrelationships between financial results of enterprises and indicators of their foreign economic activity was carried out on the basis of general statistical information on the machine-building industry in whole for the period of 2005–2015 [2; 3; 10–12]. To characterize financial results of economic activity of enterprises, the following indicators were selected: total sales revenue, financial results before taxes, net income (loss) and profitability of operating activities (return on operating activities, operating margin). As indicators of foreign economic activity, foreign direct investments, exports and imports, trade balance were considered. This assessment system was introduced in two estimates: the national currency (UAH) and US dollars (USD). Besides, some relative indicators, such as share of exports in the total volume of sales and the official average annual exchange rate of Hrivna to US dollar also were taken into account in the study. The denotations of parameters of the system are given in *Table 1*, their numerical data – in *Table 2* and *Table 3*.

Table 1

Main indicators of economic and foreign economic activity

Name of Indicator	Denotation	
	Billions USD	Billions UAH
Indicators of economic activity		
1. Total sales revenue	Y1	Y11
2. Financial results before taxes	Y2	Y12
3. Net income (loss)	Y3	Y13
4. Profitability of operating activities, %	Y4	Y14
Indicators of foreign economic activity		
1. Foreign direct investments	X1	X11
2. Exports	X2	X12
3. Imports	X3	X13
4. Trade balance (export-import)	X4	X14
5. Share of exports in the total volume of sales, %	X5	
6. Official average annual exchange rate of UAH to USD, monetary units	X6	

The analysis of the groups of the parameters allows to make the following conclusions.

Firstly, there are three clear-cut periods describing dynamic changes of result indicators of economic activity:

I. 2005–2008, when in relatively favorable business environment the volumes of sales were growing both in the national currency (UAH) and in US dollars. The crisis of 2008 had a negative impact on all indicators of economic activity for enterprises in the machine-building industry. Final financial results both in the national currency and US dollars were most sensitive to the crisis showing the decline in their values starting from 2008.

Table 2

Main indicators of economic and foreign trade activity of Ukrainian engineering enterprises, 2005–2015, billions USD

Year	Indicators of economic activity				Indicators of foreign trade activity			
	Y1	Y2	Y3	Y4	X1	X2	X3	X4
2005	13,34	0,44	0,25	3,4	0,66	4,50	9,56	-5,06
2006	15,07	0,38	0,16	2,6	0,76	5,41	13,02	-7,61
2007	20,97	1,02	0,69	4,3	0,97	8,28	18,79	-10,51
2008	24,74	0,13	-0,21	2,9	1,01	10,66	25,47	-14,81
2009	11,78	0,25	0,01	4,7	1,02	6,61	8,42	-1,81
2010	13,59	0,86	0,53	7	1,08	8,93	11,83	-2,90
2011	18,83	1,84	1,34	9,3	1,00	11,61	19,00	-7,39
2012	20,55	1,67	1,16	9,9	1,06	12,99	21,25	-8,26
2013	16,36	0,69	0,35	6,6	0,98	10,10	17,70	-7,60
2014	9,51	-1,72	-1,88	-2,4	1,22	7,13	11,37	-4,24
2015	5,21	-0,60	-0,72	3,1	0,89	4,62	8,02	-3,40

Table 3

Main indicators of economic and foreign trade activity of Ukrainian engineering enterprises, 2005–2015, billions UAH

Year	Indicators of economic activity				Indicators of foreign trade activity				X5, %	X6, UAH/USD
	Y11	Y12	Y13	Y14	X11	X12	X13	X14		
2005	68,3	2,24	1,26	3,40	3,4	23	49	-26	33,7	5,12
2006	76,1	1,92	0,83	2,60	3,8	27,3	65,8	-38,5	35,9	5,05
2007	105,9	5,13	3,49	4,30	4,9	41,8	94,9	-53,1	39,5	5,05
2008	130,4	0,71	-1,09	2,90	5,3	56,2	134,2	-78	43,1	5,27
2009	91,8	1,92	0,04	4,70	7,9	51,5	65,6	-14,1	56,1	7,79
2010	107,9	6,86	4,21	7,00	8,6	70,9	93,9	-23	65,7	7,94
2011	150,1	14,64	10,64	9,30	8	92,5	151,4	-58,9	61,6	7,97
2012	164,2	13,32	9,27	9,90	8,5	103,8	169,8	-66	63,2	7,99
2013	130,7	5,53	2,77	6,60	7,9	80,7	141,5	-60,8	61,7	7,99
2014	113,1	-20,50	-22,38	-2,40	14,5	84,7	135,1	-50,4	74,9	11,89
2015	118,7	-12,7	-15,80	3,10	19,5	100,9	175,1	-74,2	85,7	21,84

II. 2009–2012 – the industry recommenced its activities progressively increasing volumes of production almost by 2 times. In this case the work of the mechanism of operating leverage is observed, when the figures indicating financial results outrun the growth of the volume of production and sales.

III. 2013–2015 – general negative external factors and accumulated intra-industry factors significantly affected the results of economic activity of the industry causing a decline in all indicators not only in the US dollar equivalent but also in the national currency (UAH) despite significant growth of the exchange rate.

Secondly, the dynamics of foreign economic indicators reflects to a certain extent the identified stages of changing the result indicators. First of all, this relates to export and import volumes. At the same time the export growth rate in the period of the rising of the output volumes always outruns the growth rate of the latter. And in times of its falling, on the contrary, the rate of decline of the export volume in the industry is lower than that of sales, which provided for

the increase in the share of exports in the total volume of sales from 33.7% to 85.7% during 2005-2015 (with the exception of 2011 and 2013).

Thirdly, a clear trend of dependence of dynamics of economic activity result indicators from the stability of the national currency exchange rate is observed.

In general, the statistical data confirm the identity of the trend in the dynamics of the total volume of sales and the export volume of machine-building enterprises, which is the evidence of a significant influence of their business activities in foreign markets on the financial results. Growth of exports share in sales, certainly, should play a positive role providing opportunities for increasing income of enterprises especially under conditions of the national currency devaluation. But, unfortunately, deprivation of a significant part of some foreign markets in recent years has become the factor that contributed to a decrease in the total volume of exports and, consequently, to an even greater decrease in the total sales volume and the deterioration of financial

results of the industry as a whole. One more negative aspect in formation of financial results is a poor orientation of the Ukrainian enterprises towards the changes in the structure of exports in favor of modern high-tech products with a high level of added value.

The considered period is characterized by a stable excess of import volumes over those of exports [10; 12]. At the same time, in periods of a sharp increase in the exchange rate the deficit of trade balance in the US dollar equivalent has a tendency to decreasing, but provides no positive effect on the dynamics of financial results. The sharp reduction in imports took place due to devaluation of the national currency (UAH) in 2009 and then in 2013–2015, with simultaneous deterioration of financial results.

Thus, the established export-import balance has a multidimensional and often negative impact on financial results of enterprises in the machine-building industry. On the one hand, the outflow of foreign currency to purchase imported technologies and products restricts the financing of own scientific and technological research, which results in a subsequent drop in production, decline in exports and increases the resource and financial dependence of the Ukrainian machine-building on supplier countries. On the other hand, the import dependence from high-tech products and services constricts the opportunities for Ukrainian producers in the domestic market. In general, integration of the national economy of Ukraine into the world economic system does not correspond to the global trend. The inadequate and unequal process of goods exchange is one of the reasons why Ukraine is becoming technologically dependent on developed countries of the world [4].

The next stage of the research was studying foreign direct investments in the industry as a substantial factor influencing financial results of machine-building enterprises. Financial results of the enterprises do not just depend on the efficiency of their foreign economic activity but, at the same time, have a significant influence on possibilities of its development as an internal source of financing. However, without substantial external financial inflows today it is hardly possible to overcome the problems of the Ukrainian machine-building. Attracting foreign investments followed by technical innovations and new management techniques can provide a powerful impetus for the development by domestic manufacturers of their own competitive production. But, on the other hand, the conditions of international competition, technological backwardness, low level of return in the industry, instability of the government economic policy and other factors are hindering foreign investments. All this is proved by indicators in Table 2: the size of foreign investments does not take a significant place in the development of machine building; their volume is fluctuating around 1.0 billion USD and in recent years has a tendency to decline. Moreover, during the reported period the share of direct foreign investments in the machine-building industry of Ukraine in the total volume of direct foreign investments in the national economy due to continuous decline fell down almost by 4 times (from 7.26% in 2005 to 1.95% 2015). It indicates that foreign investors are reluctant to finance Ukrainian machine-building enterprises as potential competitors

in the world markets. Thus, the insignificant investments in the industry slow down the processes of its modernization, and, as a consequence, reduce the possibilities of making profit as a source of innovative development, and vice versa – low profitability of domestic enterprises is one of the main reasons of poor investment attractiveness for potential foreign partners.

The generalized research results indicate that the considered factors reflecting foreign economic activity effect financial results of the machine-building enterprises in different ways. Their interrelationships have mainly a stochastic (probabilistic) nature and are the subject of correlation analysis. The correlation analysis allows to determine and assess the interdependences between the selected factor and result indicators at the same time abstracting from their complex interactions with all other factors involved. It is applied to estimate the dependence and the closeness of the relationships between two random variables. The degree of closeness is distinguished by quantitative influence of the considered factors and those that do not fall within the scope of the study. The most precise indicators of the degree of interrelationship closeness are the correlation coefficient and correlation ratio. In case of a linear dependence the correlation coefficient ranging from 0 to 1 is used.

To estimate the interrelation of two random variables most analysts indicate the ranges and interpretations of the correlation coefficient as follows: below 0.3 – weak; from 0.3 to 0.5 – moderate; 0.5-0.7 – noticeable; 0.7-0.9 – high; 0.9 – very high. Negative value of the correlation coefficient tells about inverse relationship between the variables considered [13].

The matrix of coefficient of correlation between financial results and factor indicators characterizing the interrelationships between indicators of economic and foreign economic activities for domestic machine-building enterprises within 2005–2015 is given in Table 4.

The economic interpretation of the obtained correlation coefficients suggests the following conclusions. The values of correlation coefficients (R) determining the interrelationship closeness between foreign investment volumes and financial result indicators confirm the previously described trend: the dynamics of foreign investment volumes has no positive effect either on the sales revenue or on other indicators reflecting the financial results estimated in the US dollar equivalent.

Moreover, moderate inverse relationships take place at estimating the indicators in the national currency. The sign “minus” in this case denotes that the growth of investment flows is closely related to the devaluation of the national currency ($R = 0.963$), with no stable growth of all result indicators throughout the study period and even with their decrease during the last 3 years. However, sales revenue in the national currency (UAH) is directly dependent on foreign investment dynamics estimated in US dollars ($R = 0.600$), which certainly indicates their positive, although insufficient, role in the formation of financial results of domestic machine-building enterprises.

Correlation coefficient matrix (R) for interrelationship closeness between economic and foreign trade activities indicators in engineering industry of Ukraine, 2005–2015, units

		USD				UAH			
		Y1	Y2	Y3	Y4	Y11	Y12	Y13	Y14
USD	X1	0,069	-0,177	-0,240	0,001	0,600	-0,167	-0,222	0,001
	X2	0,725	0,601	0,539	0,658	0,886	0,613	0,562	0,658
	X3	0,925	0,487	0,437	0,382	0,675	0,501	0,485	0,382
	X4	-0,865	-0,288	-0,259	-0,085	-0,359	-0,301	-0,315	-0,084
UAH	X11	-0,689	-0,542	-0,556	-0,240	0,261	-0,640	-0,704	-0,240
	X12	-0,154	0,024	-0,025	0,338	0,820	-0,059	-0,152	0,338
	X13	0,055	0,012	-0,039	0,248	0,860	-0,082	-0,166	0,248
	X14	-0,321	0,007	0,047	-0,060	-0,679	0,092	0,140	-0,060
	X5	-0,578	-0,331	-0,358	0,019	0,453	-0,411	-0,490	0,019
	X6	-0,725	-0,486	-0,484	-0,202	0,154	-0,598	-0,654	-0,202

The volume of exports, being a part of sales revenue and estimated in US dollars, has a significant positive impact on it both in the US dollar and hrvna equivalent ($R > 0.7$). This indicator also influences positively other result indicators ($R > 0.5$) of the system described. But being estimated in the national currency, revenues from export are closely related, which is obvious, to the corresponding indicator of total sales volume ($R = 0.820$). Positive moderate impact of export transactions on the profitability ($R=0.338$) is, to a certain extent, an evidence of the profitability of the foreign economic activity of Ukrainian machine-building enterprises.

The dependence of the result indicators on the relative indicator characterizing the share of exports in the total sales volume is as follows: sales revenue in US dollars is in noticeable but inverse relationship to the export share ($R=-0.578$) due to a more rapid decrease in sales volume and losses in the domestic market compared with those in foreign markets. Accordingly, a relative reduction of exports had a negative, although less considerable, effect on the financial results and net income of the enterprises. Considering result indicators in the national currency, the dependence obtained is as follows: the share of exports has a noticeable negative impact on the final results, the correlation coefficients are respectively 0.411 and -0.490 . At the same time, the sales revenue positively reacts to the relative growth of exports ($R=0.453$) due to the high degree of dependence of the latter from the national currency exchange rate, with the correlation coefficient being equal to 0.868.

The controversial dependence of results of economic activity from import volume and export-import trade balance is revealed by correlation coefficients. If estimated in US dollars, a high positive dependence ($R=0.925$) of sales revenue on the import volume is observed due to the same cyclical stages of the industry development and availability of the demanded products and technologies in foreign markets. Obviously, the interrelationships between results of economic activity and trade balance is negative if the import volume exceeds that of the export ($R=-0.865$). Indicators of imports and trade balance correlate with financial results and net income of the enterprises in the same way but with

less closeness, which is caused by a wide range of other factors influencing the formation of the latter.

But at estimating financial results in hrvnia, the factor indicators in foreign currency have a significant influence due to the factor of hrvnia devaluation, respectively $R = 0.501$ and $R = 0.485$. At calculation of indicators of import volume and export-import trade balance their interrelationship with the result indicators is not traced. Only their correlation with the volume of sales revenue is observed, which is stipulated by general processes characterizing the intensity of the foreign economic activities in whole.

Considering correlation coefficients, instability of the national currency has the most negative impact on the financial results of machine-building enterprises. Especially noticeable interrelationship closeness is observed for indicators estimated in hrvnia, respectively $R = -0.598$ and $R = -0.654$. The national currency dynamics, which depends on the state of the national economy, is considerably determined and closely correlates with both the situation on foreign markets and the structure of foreign trade turnover. Reduction in the share of products of mechanical engineering and high proportion of commodities in the total volume of export at a certain cyclical decline of prices for the latter in foreign markets are essential factors of hrvnia devaluation, which has a negative impact on the financial opportunities encouraging development of the machine-building industry.

CONCLUSIONS

The conducted studies demonstrate that the financial soundness of the enterprises in the machine-building industry is significantly correlated with the state and level of development of their foreign economic activities. The suspension of export and its low-efficient structure as well as contraction of the internal market caused by the current production patterns and technical potential of the industry leads to the decline of profitability and, as a result, to a loss-making performance of the enterprises. As a consequence, investment attractiveness of the industry and financial opportunities for the development of high-tech production is decreasing. ■

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