

# COMPETITIVENESS FACTOR FOR INTERNATIONAL PRODUCTION COOPERATION OF HOIST AND TRAVELLING EQUIPMENT MANUFACTURERS

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**Abstract:** *The paper reveals a study of efficiency of international production cooperation of hoist and travelling equipment manufacturers of Ukraine. The theoretical aspects of international production cooperation and its influence on machinebuilding business competitiveness are studied. The great attention evaluates for the economic aspects of international cooperation in hoist and travelling machine building. The benefits of international production cooperation are evaluated for the domestic hoist and travelling machinebuilding.*

**Keywords:** *international production cooperation, hoist and travelling machinebuilding, competitiveness, international partners, new technologies*

## 1. INTRODUCTION

World trade is the powerful stimulus of development of the machinebuilding industries which come forward an infrastructural for international trade. In particular, there was studied direct connection between development of world trade and industry of logistic machinebuilding. The most important role in logistic providing is making by hoist and travelling machinebuilding.

Infrastructural industries of machinebuilding are developing by considerable rates in those countries which are leaders in the world by volumes and rates of international trade growth. Among them are China, India, Brazil, Mexico. Also there is a growth of it in countries of Middle East, Turkey, Bulgaria, and countries, where industrial potential was maintained. Such countries as Serbia, Macedonia, Croatia, Slovenia, Russia, Belorussia. Ukraine can also be amount these countries.

### 1.1 Analysis of the last researches and publications

Fundamental contribution to research of problems of international production co-operation, and also brought in in development and description of its elements were made by the famous economists and the classics of economic science as A. Smith, D. Ricardo, J. S. Mill [1], J.B. Say. And modern scientists-economists as S. Harris, E. Heckscher, B. Ohlin, P. Samuelson, W. Leontief, M. Porter, F. Perroux, G. Myrdal. In the works they studied international trade,

world economy relations, and naturally made differentiation of new production relations of foreign economic activity for enterprises. The interest is attract by the works of domestic and Russian-spoken scientists as M. Boguslavskiy, I. Gerchikova, I. Gromova [2], I. Denisova [3], Y. Kormnov, R. Novikov, L. Rodina, Y. Shishkov, M. Tuhan-Baranovskiy, E. Yakovleva and others.

### **1.2 Research purpose**

One of the strategic priorities of development of economy of Ukraine is the international production co-operation with the foreign producers of machine-building equipment, which product high-competitive equipment by modern technologies. That is why the current issue is making of effective forms and mechanisms of production co-operation of domestic enterprises and foreign partners with the purpose of increase of competitiveness of machinebuilding of Ukraine.

The purpose of the publication consists in the improvement of theoretical and methodical principles and practical explanation of efficiency of international production co-operation at industry of hoist and travelling machinebuilding for improvement it competitiveness.

### **1.3 Research methodic**

The methodological and theoretical basis of scientific research are the dialectical method of principles of systems analysis, methods of statistical processing and analysis of information, fundamental positions of such scientific studies as economic theory, innovation and investment management, theory of market economy, domestic legal base of functioning and development of industrial complex, the publications of researches of domestic and foreign authors in the sphere of scientific research.

## **2. PRINCIPLES OF INTERNATIONAL PRODUCTION COOPERATION**

The cooperation was recommended as a one of ways for increasing of competitiveness of enterprise during it existence. It remains a same effective as other market instruments of competitiveness increasing. Essence of cooperative form consists in predominance of collective interests above the personal and awareness of possibility for decision of economic system development problem by mutually beneficial cooperation with a competitor or partner. The cooperative form of business doing is more adaptive to fluctuative consumer demands in difficult social and economic, and political situation due its flexibility.

In tote business cooperation is an organized production cooperation between separate workers, collectives of brigades, departments, workshops, maintaine services in the process of business activity for achievement of certain production (most of all, positive) effect. Labour cooperation is predefined by specialization of production, by technical equipment level, by manufacturing processes, by the forms of labour organization, by the technological and organizational structures of enterprise.

International production cooperation by L. A. Volovik is the form of external economic relations that is characterized by that components and details of cooperated products are made by the draft proposals and technical requirements of customers, and foreign trades contracts on production and delivery of such products carried out a contract character [4].

According to E. A. Leynert [5] the international production cooperation is a type of foreign economic activity when the business units of different countries carry out the production

process (or process of consumer value increasing) of separate types of intermediate products (or commodities), which are used as component elements for production of the finished good. This form of foreign economic activity is made on contract basis.

In general, an economic literature defines term of production cooperation in international collaboration in a qualified sense under which could be understand especially as cooperation in production activity and in wide extent – as cooperation including different spheres of economic activity of enterprises: R&D, logistics, manufacturing, sales, management [6].

Resuming of definitions of mentioned authors we consider that international production cooperation is the form of international division of labor which consists in development of production connections which arising between the foreign specialized business units with the purpose of combination of mutually complementary productions processes.

Efficiency of international cooperation consists in providing of the most rational using of labour force and labour facilities, continuity of productions processes, rhythmic implementation of manufacturing works, increasing of labour productivity, mutual complementary of technological processes, and also in establishment of rational mutual relations between international participants of production for achievement of mutual aims.

An effect of successful cooperation carries out synergetics character. In tote synergy is that advantage which is achieved during cooperation. Synergy is resumptive effect which achieved at cooperation two or more factors but action of each of them substantially less in the case of simple sum of their separate effects than the mutual action. It achieved when possibilities of one company join up with possibilities of other company.

The distinguishing features of international production cooperation are:

- preliminary concordance of joint activity terms by participants;
- coordination of activity of partners of different countries is the main method of collaboration;
- presence of industrial subdivisions belonging to the different countries in direct production cooperation;
- fixing in the agreement of main cooperation objects: finished products, components and technologies;
- distributing between the partners tasks within the limits of the concerted program, fixing after them of production specialization, coming due the main objectives of cooperation agreement;
- direct connection carried out by the partners of reciprocal or one-sided deliveries of commodities with realization of the productions programs within the limits of cooperation, but not as an implementation of ordinary sales contracts [ 7, p.43].

Classification of international cooperation has 24 types. But in world practice are most used types are presented on figure 1.

A terminology of UN Economic Commission for Europe (UN ECE) from 1983 years has definition of “industrial collaboration” (to the term the "industrial collaboration" is equated term "production cooperation" in wide value) that means as "relation between companies of different countries, which based on of long term joint interests". The industrial collaboration can include the licenses grants, establishing of enterprises or production lines; development of new types of technologies and grant of the information related to these types of technologies; production, marketing, joint projects or joint request for tender for a contract. Obligation at whole or part of obligations, which arising during realization of collaboration, can be covered by mutual settlements (counter deliveries of similar commodities or services).

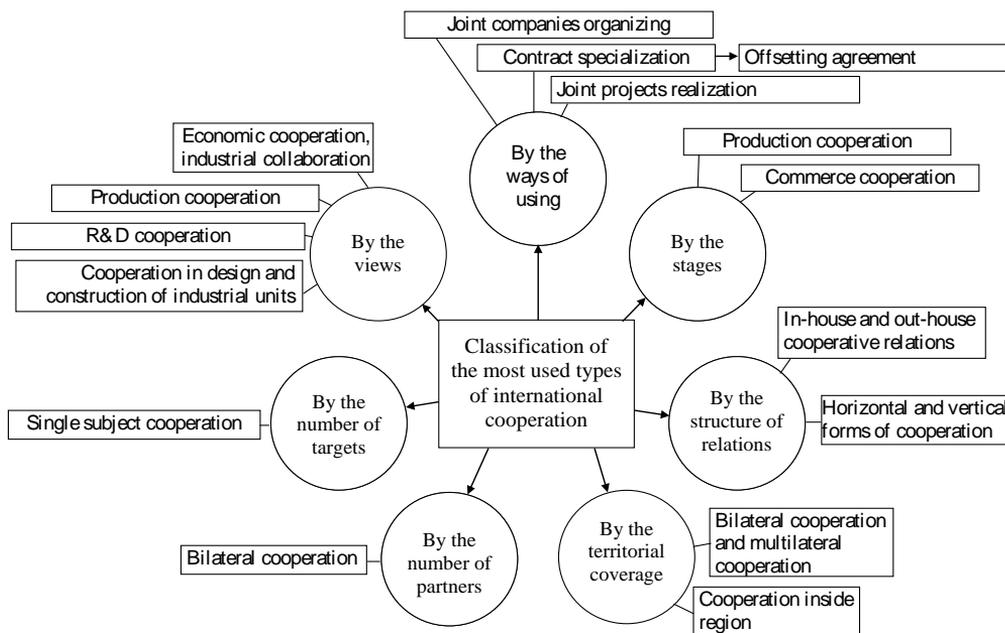


Figure 1. Classification of most used types of international cooperation

Many foreign economists define the most important peculiarities of international industrial cooperation as long-termness (repeatedness) of business connections, direct orientation on production of material welfares, joint or technologically joint business activity with the aim of costs economy, production improvement, labour productivity and products quality, and production efficiency increasing. Thus cooperation activity took place both production and activity which was preceded to production process or related with it by another way, for example as realization of finished products [8].

According to conception of ECE UN [9] the forms of industrial cooperation are selected:

- delivery of complete enterprises and equipment with subsequent payment of their cost by products which are coming to produce on their basis;
- licenses and (or) production experience grants, and also knowledges with subsequent payment of their cost by products which are coming to produce on their basis;
- succession;
- joint production, including researches and development (R&D);
- joint ventures;
- joint projects.

### 3. PROBLEMS OF INTERNATIONAL COOPERATION FOR DOMESTIC INDUSTRY OF HOIST AND TRAVELLING MACHINE BUILDING

In modern globalization terms hoist and travelling machine building belongs an exceptionally important role for acceleration of scientific and technical progress. Manufacturing of tools for different industries of national economy, infrastructural machine

building will realize achievement of scientific and technical progress and provides complex mechanization and automatization of manufacturing process [10].

Peculiarities of crane and hoist manufacturing industry are:

- difficult technical process;
- needs in certification and permission documentation;
- difficult installation works that provokes a danger for persons who will be operate a crane equipment;
- nessesary of providing regular preventive maintenance and technical service.

The state of external factors for production cooperation development of domestic enterprises of hoist and travelling equipment industry concerns by the presence of substantial obstacles and difficulties in this sphere. Among them are: irrationality of industry structure and territorial deviding of enterprises in Ukraine; selective specialization of most of enterprises; huge reduction of demand on the products of hoist and travelling industry during 1992 till 2002; high level of intermediate resource consumption and metal intensiveness of machine-building production in particular; break of traditional business cooperation connections in the CIS; imperfection of mechanism of intergovernmental collaboration in the sphere of production cooperation; low level of mutual trust between the participants of cooperation connections; imperfection of the state regulations of cooperation relations of enterprises on national and regional levels [11].

Biggest hoist and travelling enterprises is located in Ukraine in Odessa, Lvov, Kharkov, Nikopol, Priluki, Dniepropetrovsk. Middle enterprises are located in Slovyansk, Kramatorsk, Zolotonosha (Cherkas reion), Alexandria (Kirovograd reion), Kivertsy (Volyn region).

The operations of residents which are carried out implementation of production cooperation agreements are the operations of raw material, components, details, spare parts, procurement and other products of production purpose delivery which are technologically associate and need for the joint production of eventual products. Also operations of service providing of design projects and repairs works, technical service, related for production and realization of eventual products [12].

This collaboration and similar it forms would considerably assist to development of separate productions, and also increase of export commodity and services, receipts in the state budget, improvement of macroeconomic parameters [11].

The content filling of international production cooperation in modern terms is joint production of technological, innovative products with specialization (by element approach or by unit approach) of separate subjects of production. International cooperation takes place on the base of long-term contractual relations, which provide for direct permanent production and scientific and technical, designer and engineers connections between partners two or more external (foreign) and functionally independent one from other economic structures. The sense of their joint production activity is specialized production that enables to promote the labour productivity for all partners and multiply their combined production volumes [13].

The most developed production cooperation is took place in area of assembling of large technical objects, difficult machines, hi-tech equipment, scientifically oriented productions processes like special purpose gantry and overhead cranes (explosion and fire proof cranes, special grab cranes for danger productions and etc.). In the same cooperation chain (even in technological process) an operating cooperation model can unite lines and features of national and international cooperation forms as in the case of international elements and units exchange, in the case of presence from one participant and national subcontractors.

#### 4. HOIST AND TRAVELLING EQUIPMENT MANUFACTURING ANALYSIS: FOREIGN TRADE FACTOR

World trade is one of the first industries of world economy which restored after world crisis 2008-2009. The volume of world trade attained a level of antecrisis period, and rate of its growth for this period till +15,1 % (growth rate in 2009 was -13%).

The growth of industrial production in Ukraine during January-June, 2011 consists of 8,7% as compared to similar last year's period by the data of State Committee of statistics of Ukraine. At the same time, the volumes of industrial products volumes in June diminishes on 0,4% in comparing to May of 2011. The growth of industrial production in June of 2011 to the similar month of 2010 consists of 8,9% (in May – 8,6%, April – 4,9%, March – 8%, February – 11,5% and January – 9,7%).

The biggest rates of growth of industrial production in comparing with a first half-year of 2010 are fixed for machine building – 21,2%. Chemical and petrochemical industry production grew till 18,3%, in production of other non-metal mineral goods – on 15,3%, in wood industry and production of wood wares except furniture – on 13,5%, in light industry – on 13,4%, in metallurgical production – on 10,2%. Production of food products, drinks and tobaccos for half-year diminishes on 3%, coke, products of oil refinery – on 3,6%. [14]

In same time the growth of hoist and travelling equipment production volumes (in monetary index) had increased on 15-20 % per year on average for the last decade. But last crisis was negatively reflected on the rates of industry development. In antecrisis year – 2008 growth of volumes of sales consists of 23 % for overhead and travelling cranes and 73 % – for gantry. The production volumes (in natural indicators) in 2008 is less in 10 times for gantry cranes and in 7 times for overhead and travelling cranes in comparing to the indexes of 1991 (table 1). A big share of hoist and travelling machines demand in Ukraine is satisfied with the technique of the imported production.

Table 1. Production volumes of gantry cranes, overhead and travelling cranes and hoists in Ukraine, sets (by the data of Ministry of industrial policy of Ukraine)

Products name	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Electric gantry cranes, sets	61	77	64	97	110	92	87	97	168	98
Electric hoists, sets	7494	8102	6287	6988	7212	6209	7146	8934	8515	2430
Single girder electric cranes overhead and travelling, sets	1305	1596	1638	1598	1546	1497	1768	2212	2740	1302
Electric overhead cranes of special purpose with capacity 20 t and more, sets	9	11	6	17	13	9	20	24	24	4
Grab electric overhead cranes, sets	15	25	14	10	16	22	26	21	46	10
Electric overhead cranes of special purpose, sets	134	105	74	83	94	117	107	189	96	15
Electric overhead cranes with capacity 20 t and more, sets	24	13	9	11	6	8	10	9	9	
Electric overhead cranes of general purpose, sets	387	578	581	560	374	568	447	750	636	427
Electric overhead cranes (including special purpose cranes), sets	521	683	655	643	468	729	554	939	748	442

Figure 2 give an opportunity to draw conclusions, that production of cranes from 2003 to 2007 was better, but afterwards indexes of production – fell down almost on a half. If to analyse the production volumes of cranes from 2003 years, then is possible to say, that

insignificant oscillation of unmoveable cranes, there is a noticeable slump only in 2009 (for 111 sets less than in 2008).

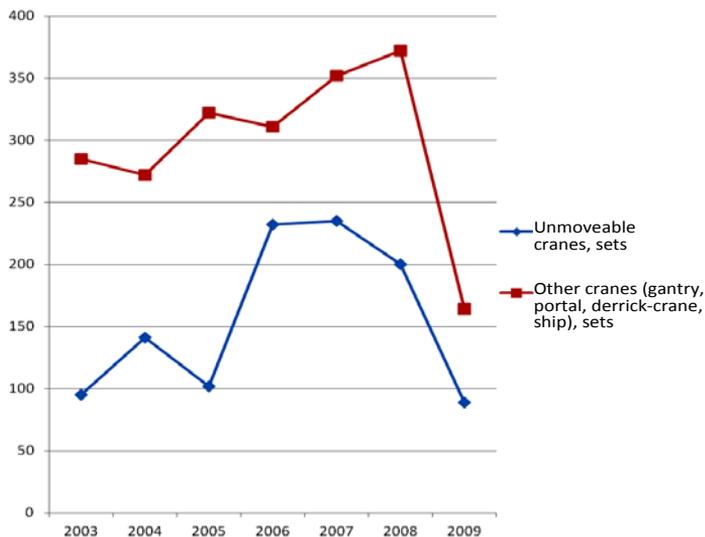


Figure 2. Crane production in 2003-2009 [15]

In relation to other cranes (gantry, portal, derrick-crane, ship), beginning from 2007 year there is a smooth slump. Main reason of diminishing of crane production is an economic crisis which resulted in reduction of demand on this products.

Today hoist and travelling equipment industry has the certain failings such as:

- old technologies of production;
- predominate products of 2<sup>nd</sup> – 3<sup>th</sup> generations of techniques in general production volumes;
- uneffective engineering (low rate of automatisation and robotization);
- high share of hand labour in production of cranes;
- domestic cranes keep a 10-multiple reserve of durability;
- that considerably promotes their weight;
- high cost of financial charges in production, difficult transporting, installation and operating;
- domestic cranes consume more electric power than foreign analogues;
- also our cranes at the calculation of cost per 1 kg of weight is worthen than foreign analogues (in comparing to the foreign technique of 4<sup>th</sup> – 5<sup>th</sup> generation).

One of the main index of production cooperation is an unit selfcost. Unit selfcost on the deep specialized enterprise of machinebuilding and radius of transportation to the districts of consumption usually are in inversely proportional dependence. That is why within to limits of internal industry cooperation the factories of element approach specialization can be territorial considerably remote from the factories of subject specialization, which serve the necessities of a few economic districts or all Ukraine [16].

If to examine enterprises which are engaged in production of cranes, it is nessesary to pay attention to JSC Azovmash, JSC Yuzhmormontazh, LC Dniprokranmontazh, machinebuilding factories of JSC Ukrprommash, CJSC Konecranes Ukraine, RPITC Kranservice and others.

Selective character of territorial and branch dividing and difficult structure of cooperations of domestic hoist and travelling equipment industry is stipulated the origin of numerous difficulties in the process of adaptation of enterprises to the new requirements. By the one hand, insufficient level of quality of considerable particle of assortment of products which was produced, on a background of common distribution of the crises phenomena in a national economy and making progress diminishing of solvent demand of users in 1990-1999 resulted in the collapse slump of volumes of hoist and travelling equipment production. By other hand, disintegration of unique business and industrial complex became reason of not only loss considerable users in other states of the CIS but also stipulated the sharp break of cooperation connections with traditional partners and suppliers. Deminishing of production volumes took place almost after all spectrum of machines and equipments which was made enterprises of hoist and travelling machine-building industry.

## **5. PECULARITIES FOR ESTABLISHING OF INTERNATIONAL PRODUCTION COOPERATION FOR HOIST AND TRAVELLING MANUFACTURERS**

A poscrisis period is a friendly time for establishing of partnership in the field of production cooperation, that can be used by the enterprises of hoist and travelling machine-building industry of Ukraine for finding of advantageous foreign investor and partner. A few external and internal factors stimulated international production cooperation of machine-building enterprises of Ukraine. Among external factors are:

- change of geography and high-quality descriptions of world trade;
- change of ways for logistics;
- small number of low-risk alternatives for investment and etc.
- Among the internal factors are:
  - low labour costs together with high qualification of technical staff and engineers;
  - insignificant production load of existent enterprises;
  - access to the cheap raw material products;
  - high wearing of infrastructure of economy of country, that forms additional demand on hoists and travelling machines and etc.

Making of effective forms and mechanisms of production cooperation for domestic enterprises and foreign partners becomes the main issue of the day with the purpose of increase of competitiveness of Ukrainian machine-building. Experience of the Turkish and Bulgarian, and Chinese producers which considerably increased for the last 15 years market shares of hoist and travelling equipment in such countries as Ukraine, Russia, countries of the CIS and East Europe.

As a result of analysis of export-import of hoist and travelling equipment it is possible to draw conclusions, that biggest exporter and biggest importer of overhead and unmoveable cranes is Russia, and the smallest importer is Turkmenistan from the countries of the CIS. From other countries of world, Bulgaria is a biggest exporter in Ukraine, Germany is a biggest importer, and smallest importer is Belgium.

The biggest country - exporter of gantry cranes and overhead and travelling cranes, portal, derrick-cranes and ship cranes is Russia. The smallest one is Kazakhstan from the countries of the CIS. Kazakhstan is has no import in general. In other countries of world, biggest exporter is Africa, most importer is Europe. USA is a smallest importer of cranes from Ukraine.

The export of tower cranes prevails in Russia and Asia, small share of export is prevails on Belorussia and Africa. Biggest share of import is prevails on Russia and Europe, the smallest share is for Africa.

Table 2. Evaluation of effects for Ukrainian companies in making production cooperation

<b>Domestic companies</b>	<b>Foreign companies</b>	<b>Cooperation effect</b>
JSC Yuzhmormontazh	Balkankran Ltd. (Russia)	A client base will be multiplied
JSC Azovmash (crane department)	Konecranes VLS Corp. (Germany)	Profitability and production volume will be multiplied, a client base will become better
Kharkov factory of Hosit and travelling equipment	Podemkran (Bulgaria)	New industrial cranes will add an operationability in the robot of composition, to the factory, workshop
JSC Starokramatorskiy machinebuilding factory (inside holding of Ukrprommash)	Liebherr Company (Germany)	A production volume will be multiplied due quality and brand arising

A potential partnership with a country-leader Ukraine will be able to adopt the inventions and use them in an economy. The same way had China which cooperate together with Germany and afterwards start to produce similar products but on own factories. This action had resulted in the improvement of indexes in an economy.

For the future growth Ukrainian companies (mentioned companies) need to cooperate with foreign partners. The most effective partner is a strong partner, leader on market share. Below is an evaluation of effect of cooperation for domestic companies (Table 2). The foreign partners are potential partners.

## **6. CONCLUSIONS: EFFECTS OF INTERNATIONAL PRODUCTION COOPERATION FOR HOIST AND TRAVELLING EQUIPMENT MANUFACTURERS**

1. International production cooperation in industry of hoist and travelling machine building has the row of positive and negative effects. Possibility of receipt is a main positive effect from the foreign partner of modern technology of production, which is characterized by the low resource-demanding, by labour intensiveness and provides more low prime price (in 1,5 - 2 times), and engineering; reduction of terms of production cycle; achievement of international standards in relation to quality of products. The main negative effects which it is necessary to take into account during cooperation partner finding we take: a loss market share for permanent clients. This effect is related to main interest of foreign partner which consist in using of domestic company and its client base at the entrance and fixing at the foreign market with the use of production cooperation. Market entry will have an effect with low cost for foreign partner. Save resources of foreign partner could be invested in development of technical base of domestic partner or in other ways for example.
2. Economic efficiency of international production cooperation is measured by the general economy of charges of production on unit of the prepared products by bringing in of the

specialized partners. The use of different forms of international production cooperation can give to both of participants few economic advantages not only due to reduction of prices of the finished good on the basis of co-operation with the specialized partners. Researches of other author shows that international agreements about cooperation on the average on 14-20 months abbreviate the terms of adjusting of production as compared to organization him by own forces, on 50-70% reduce the cost of mastering of production. Efficiency of international cooperations supplies and growing use and attractiveness for firms is related also to the action of other economic factor. Some of them is extraordinarily high break in the level of import custom duties for components and import custom duties for finished products in the many countries. The boom looked after in the last decade is explained on creation of formal cooperations productions of frame-clamping type by this mentioned circumstance.

3. The positive effects for domestic producers of hoist and travelling manufacturers from international production cooperation will achieved by:
  - reduction of terms of adjusting of production;
  - providing of long-term loading of production capacities and proof of long duration sales of finish products;
  - technical rearmament of industry, expansion of export orientation of production, achievement of international standards in quality of products, providing of load of powers and increase of employment of population;
  - increasing of level of technical production;
  - expansion of client base due to the improvement of quality of production.
4. Consequently, as conclusion we can resume that enterprises which cooperate with other enterprises have a greater income for all variants of cooperation, less selfcost and squeal competitiveness at the market.

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