

Export Share of Ukrainian Electronic Industry Transition

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Abstract

The paper is devoted to the research of the export capacity of enterprises of electronic industry in Ukraine. The paper investigates the main aspects of export activity and ability in the case of the enterprises from the electronic industry, the trends and prospects of the national enterprises to develop their export capacity, considered features of export activity implementation. In terms of the examined trends and factors affecting the export, it was suggested an algorithm for improving the export capacity of enterprises of electronic industry in Ukraine. The authors emphasize the idea regarding the real possibility of achieved electronic industry growth based on export orientation only.

Key words: *export capacity, elements of export capacity, electronic industry, improving mechanism of export capacity, priorities of development.*

JEL Classification: *F14*

Introduction

The reasons that make a topic of export possibility for business (in academic literature of developing countries especially) is actually due to the benefits. These benefits consist in business activity indexes growth for national producer that reap when it pushes on the world market. Global trade exposes for its participants new horizons and new possibilities which are related to the greater volumes of incomes.

The world industry of electronics is inherent to considerable science intensiveness and rapid rate of update of production and technological processes. Domestic electronic industry suffered a row of economic shocks. Among them were: 1) the conversion of the 80's of the 20th century due to the unsuccessful conversion of military branches of electronics in the middle and second part of the 80s; 2) the considerable decline of production volumes of the 90s of the 20th century due the system economic crisis induced by transition from the planning economy to the market economy. Another negative factor for electronic industry was the market opening for import products, including consumer and computing techniques. And 3) the deficit of financial resources in industries with a low level of profitability and high risks (due to long payback period in using innovative technologies and hyper high rates of inflation) comparatively with a

retail-entertainment and intermediary sector (that provided a high level of profitability and low risks) at the beginning of the 21st century in Ukraine.

The macroeconomic processes which have taken place in a country for the last 20 years did not have a positive influence on the industry of electronics in Ukraine. Since the beginning, it was oriented, first of all, towards providing for the demand from defence technologies. Marked negative internal and external factors became a reason for the disparity of the potential of the domestic electronic industry to the necessities of global economy.

A quick solution for the survival of the electronic industry was found in the essence of globalization. Particularly, an export orientation of companies was provided not only by the growth dynamics (quantitative growth) but also by the qualitative development of the industry. Under the conditions of cycling and globalization, a serious problem of the high-tech industry in Ukraine is the decline of the domestic market. The electronic producers need to focus on external customers as well. One of the areas of domestic electronic goods is targeting foreign markets with stable demand. There were no any other alternatives for the survival of electronic industry than export orientation.

Development of electronic industry in Ukraine during all its history from formation (at the beginning of 1920) until 1990 was concerned with the demand for innovations. This industry has always been innovative. As regards the demand for innovation, it always depends on the state and it was always related to the decision of defense tasks. As soon as the state stopped demanding military technologies, the collapse of 1990 came for electronics.

If Ukrainian economy transition from directive to market was finished officially in 2005, the electronic industry transition after the world economic crisis of 2008-2010 had a slow character. However, the industry will have a long way of transition in order to survive. And the export share in the activity of electronic enterprises will remain the unique stimulus for transition.

Currently, the industrial businesses have great opportunities for the development and use of their export potential which is determined by the effectiveness of their success on the foreign market. The efficiency of export operations characterizes the enterprise adaptation for winning in the international competition. Practical problem solving depends on the efficiency of the export capacity in the company.

The export problem of domestic high added value business, scientific intensiveness and competitiveness of industries, and environmental analysis of high-tech industries are reflected in theories by Alymov O. [1], Bazhal Y. [2], Heits V. [3], Grove A. [4], Egorov I. [5], Crafts N. [6], Malitskiy B. [7], Nordhaus V. [8], Solovyov V. [9], Solow R. [10], Varshavskiy L. [11], Vanston J. [12] and others.

Problem

The authors consider the development of the practical recommendations for improving the export share of Ukrainian electronic industry with a view to the industry transition as a main economic academic and practical problem.

Research Object

Quantitative growth and quality development of Ukrainian electronic industry.

Research Subject

Using the export share as a key indicator for the ability of electronic companies to ensure quality development and their ability to supply its transition towards survival.

Methodology

The theoretical basis of the research is supported by a systematic approach for determining the export capacity of electronic industry in Ukraine. The research methodology includes

systematic methods and comparative analysis, theoretical generalizations, modeling of the export capacity increase in electronic industry.

Research Results

1. The export capacity of electronic industry enterprises: essence and methods for determining

The export is conditioned by several factors. Firstly, the raw materials need to be exported to the manufacturer and components need to be exported to the assembling line and finished goods exported to foreign retailers and consumers. Sometimes this whole process occurs within a vertically integrated company. So, the exporter sells its products to the next level by filling out an intracompany agreement. However, in the case of sales apart from the buyer, the exporter can decide whether to sell his products directly or through an agent (Moskalyk, Chorniy, 2007) [13, p.169].

The export capacity is different from the export potential. The export potential is the amount of products that will be realized abroad. However, the export capacity of the company observes the way in which the export possibilities of these products and their prospects can increase. The export capacity provides a description of such elements and factors as the growth of enterprise components. If these components will grow then the export of these products will increase.

The analysis of the definition of "export potential" by Chorniy O.T. [13, p.150] can give us a vision of export capacity. Export potential is characterized by the ability of the enterprise to sell goods to foreign economic entities and to export goods through the customs border of the country, including re-exports of goods, except for transfers of property subject to foreign economic activities by the foreign subject abroad as a natural part of participation in the capital investment for joint economic activities. The export capacity could complete the export potential definition with "maximum possibility of companies to sell their products on foreign markets". The export capacity elements are presented in Figure 1 [14, p.53].

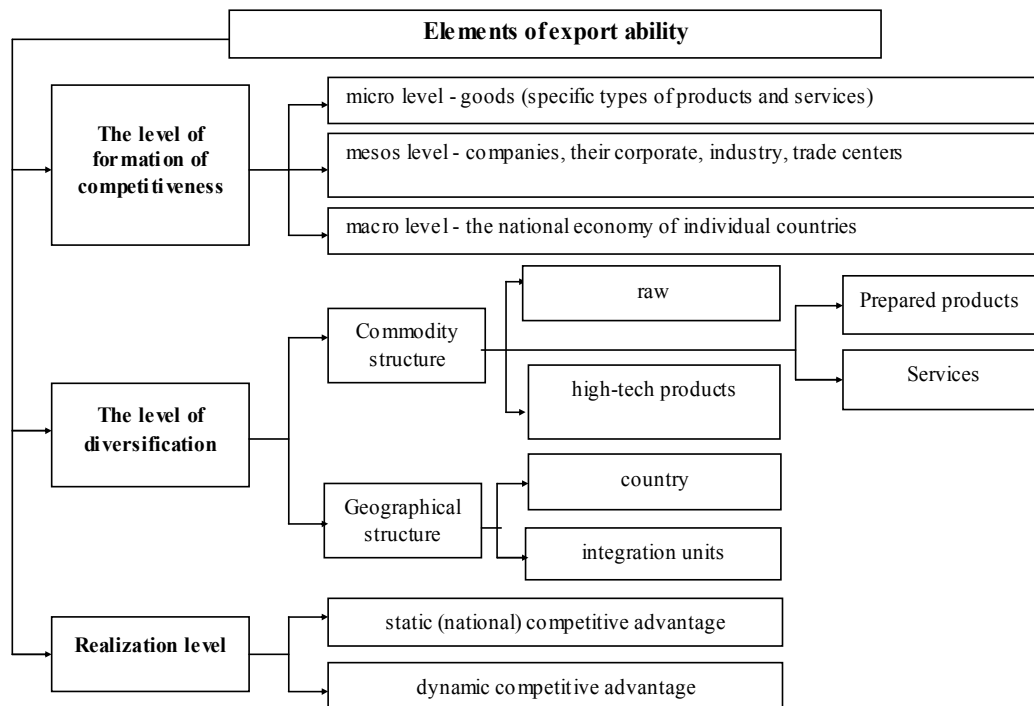


Fig. 1. Classification elements of export capacity

This approach provides an opportunity to trace the dynamics of export capacity global and regional levels, to determine its status, role and level of development in the global economy. Thus, each level has its own individual structure of factors that define and characterize status of each element of export capacity [14, p.25].

The export activity could be done by using the conditions of pure export potential only. The relationship between categories of “export potential” and “enterprise activity in the external environment” reflects the dialectical essence of the process of export capacity development. The export capacity is no longer the actual activity in the foreign sector for the enterprise. But it is just beginning of mentioned activity, like a hypothetical program (plan of actions) that relies on the forecast possibilities of the firm. Moreover, the exportability could represent a degree of development (establishment) of the company as an agent of foreign economic activity.

Briefly, the export capacity could be explained as the maximization of company opportunities for selling their products down the foreign markets.

The export capacity of the manufacturing enterprise is an ability of production and implementation of competitive products for export, their promotion on the international market, product sale with a specified rate of profitability and provision of high level of service.

Therefore, the export share of production determines the competitiveness, the production capacity, the export activities and the financial capacity of the company.

Thus, the primary function of the export capacity of the enterprise is the dynamic adaptation to the changing demands of the world market. An implementation of this feature requires that the firm should constantly develop its export capacity in the direction of industrial production.

The enterprise development means directing their capacities towards innovative development, as an orientation towards innovation under the modern conditions of competition on the international market. It can provide the necessary capabilities to implement their enterprise export potential opportunities. It will provide a mechanism of export capacity and will help to improve export. The enterprise should be directed towards finding new ideas, research and technological development by introducing new technologies and manufacturing new products. So, the company can secure a competitive advantage not only on the domestic market, but also as a prerequisite for entering onto the foreign market, and therefore, it increases its export potential.

It should be noted that the export capacity of a company has a dual nature. On the one hand, it is an indicator of the economic requirements for the object at international economic sphere. On the other hand, it is the object that connected (including implementing) the main objective function of the company to ensure competitiveness on international market. Therefore, export capacity and export potential are closely related to the competitive potential and competitiveness.

2. Evolution and definition of the main ways of electronic industry development in Ukraine

In the transition period of Ukrainian economy (1992-2005) the electronic industry suffered a few *periods* of survival:

1st period of 1992-1994 was characterized by a series of state orders from Ministry of Defence of Ukraine for supplying domestic electronic components and equipment for radioelectronic complexes and parallel increase in production of a share of nonspecialized products and related services.

2nd period of 1994-1998 was characterized by zero-order condition for electronic components by the state, diminished production volume of nonspecialized products and related services due the insolvency demand for civil electronic products. Domestic producers could not compete with

cheap low quality import electronic consumer devices due to the opening of a good market for import. The survival of enterprises was achieved by selling the basic assets of the enterprises which were not totally loaded.

3rd period of 1998-2004. The demand for domestic electronic products of the special and military purposes starts to be provided by the foreign customers. The electronic industry transition which was accompanied by slow rates growth was oriented towards the export. The export share of electronic products continued its stable raise.

4th period of 2004-2009. The export of electronic products approached 90 % in the case of all manufactured products. The survivor enterprises re-oriented towards the export and multiplied production volumes. Foreign demand for products and technologies which provide alternative energy (production of raw material silicon and silicon plates for sun energy) was multiplied simultaneously. The industry transition process increased and gained positive character. Unfortunately, the world financial crisis was perniciously reflected in the export orders of domestic electronic enterprises. The industry did not have time to be fully transformed.

The electronic industry of Ukraine was jointed in a military industrial complex and counted 43 companies in the middle of the '80s of the 20th century.

The electronic industry and its sub-industries like telecommunication and device building are the important sectors of industry and represent both the scientific and the technical potential of Ukraine [16].

The enterprises of mentioned industries maintained positive technological and economic indicators of business activity commodity and produced products in acting prices total 267.5 mln USD in 2009.

Today, Ukraine's electronic industry is represented by the following producers of electronic base and equipment which yet remained and did not lose co-operation connections and foreign markets: JC "Kvazar", SJHC "Artem", RDI of microdevices, RPE "Kristal" Kiev, RPE "Kvant-Efir", JC Kiev plant "Radar", RPE "Saturn", JC "Gamma" Zaporizhyya, JC "Graviton" Chernivtsi, JC "Rodon" Ivano-Frankivsk, "Dnieprosemiconductors" Kherson, JC "Dnipro mechanical plant", JC "TETZ-Invest", SJHC "Kaskad", JC "Projector", JC Plant "Mayak", SC "Omega", JC "Yunist", JC "Dnieprovske", JC "Pivdenniy radiozavod", JC "Ltava", JC "Konnektor", SC "Plant "Radiorele", JC "Electronmash", SC "Donets", SC "Polyaron", JC "Ingul", JC "Plant "Vimpel", JC "Gazotron", JC "CheZaRa" etc.

The biggest exporters among them are:

- JC "Kvazar" (Kiev) – elements for solar energy panels, silicon monocrystals, silicium polycrystals (80 % export share);
- JC "Pillar" (Kiev) – services for cutting of silicon wafers (95 % export share);
- SC "Donets" (Lugansk) – silicon growing line systems (41 % export share);
- SC "Omega" (Sevastopol) – sensors and electronic components for military techniques (75 % export share);
- JSHC "Artem" (Kiev) – radioelectronic radar systems and equipment for armament storage (96 % export share).

The basic focus in the development and realization of the state policy regarding the development of electronic industry is the development of modern and competitive products, production development of domestic producers, domestic market saturation by domestic products. The mentioned elements of state policy have to exclude the imports because the market of consumer electronic goods consists of imported goods production, and it increases the export potential of the country [18, p.359].

The *priority directions* of the Ukrainian state policy in radio electronics are:

1. Microelectronics
2. Microwave electronics
3. Communication techniques
4. Semiconductor devices
5. Cathode-ray tubes
6. Piezoelectric products
7. Ceramics and products on their basis
8. Special purpose products
9. Computing techniques.

The feature of the Ukrainian electronic industry is a core function for other industries, including:

- telecommunications and computer manufacturing facilities;
- instrumentation;
- different branches of engineering.

Domestic industry does not produce final consumer products. The demand for electronic products is determined by the development of the entire infrastructure of high-tech industries, which use electronic components or devices.

The *factors* which influence the priority given to the electronics as compared to other industries for Ukraine [15] are:

- international political and economic restrictions on the sale of techniques and technologies which could be used for special (or military) technique (for example, Ukraine sold double purpose electronic devices for Iran via an agent in Israel);
- significant high-specialization manufacture of products of modern microelectronics due to their complexity (there is a possibility of their use provided a precise analogue equipment and systems by foreign developments only by copying);
- diminution of the technological and security independence of electronic systems, denial of their own design and manufacturing of key electronic products.

The Ukrainian electronic industry can be self-sufficient and self-surviving under the follow *terms*:

1. Saving the existing potential of production capacity and its development;
2. Recovery of manufacturing of resource base (polysilicon, monosilicon etc.);
3. Development and accelerating the production of solar energy components;
4. Development of related industries for electronics (air, space, defence, etc.) and targeting them for domestic components.

In this case, as predicted, industry development can be reached by domestic semiconductor production from 20% (for transistor electronics) to 90% (for information systems).

3. Improving algorithm of export share for electronic production

The providing process of exportability of electronic companies represents a sequence of operations that start with receiving an array of available information about the status, trends and prospects for foreign economic activity. This information is multi-processed step-by-step, leading to the administrative decision in a formalized form [17]. This decision is a program of measurement for the optimization of one or another aspect of export capacity at the enterprise development (Figure 2 [17]).

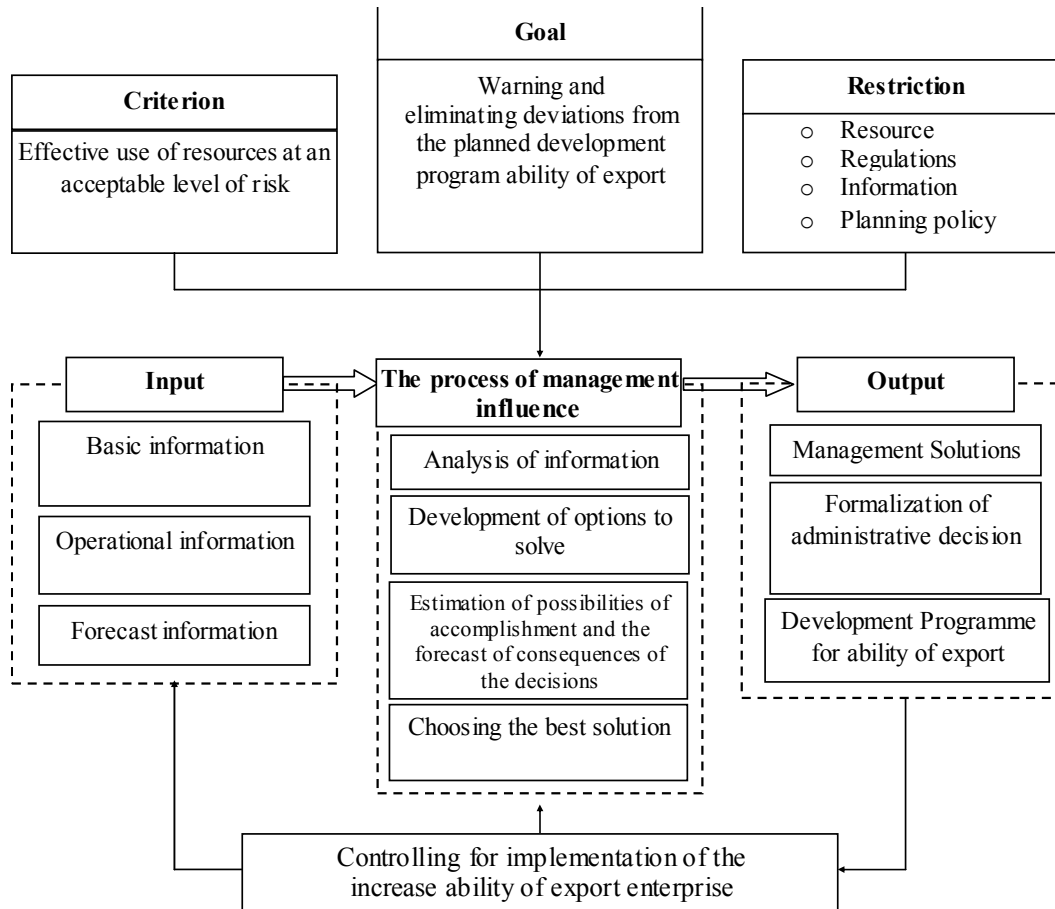


Fig. 2. Functional model of export capacity increasing of enterprise [17]

Table 1. The predicted indicators of development of electronic industry for 2011-2015 at realization of the offered algorithm of the export capacity increasing

	Years										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Sales volume, bln. \$	0,76	0,69	0,67	0,69	0,69	0,91	1,01	1,29	1,52	1,79	2,10
Nominal adjusted GNP for forecast growth rate of real GNP, bln. \$	82,77	88,25	91,08	119,82	101,85	119,6	126,3	135,39	144,6	156,17	169,44
Share volume of electronics sales to GDP, %	0,76	0,68	0,73	0,57	0,67	0,76	0,86	0,95	1,05	1,14	1,24

The first phase of the program is determining the priority degree for foreign trade development in the total activity of enterprise and its prospects, strengths and weaknesses sides of organization and management for foreign trade, their impact on competitiveness, export performance and use of enterprise resources (Figure 2). The results of the first phase in formalized form is a card of strengths and weaknesses identified in all organizational and economic aspects of export activity, indicating their causes, as well as indicators of competitiveness factor breakdown products.

The implementation of the above-mentioned ways of solving these problems will increase the export of electronic industry. The connections between electronics and related industries and respectively the export capacity of electronic industry enterprises in Ukraine will improve.

Conclusions

1. The export capacity indicates the maximization of company opportunities to sell their products on foreign markets.
2. The electronic industry of Ukraine features a system forming function for other industries, including telecommunications and computer manufacturing facilities, instrumentation, different branches of engineering.
3. The strategic direction towards electronics growth aims at the restructuring that changes the definition or settlement of priorities and the time for getting priorities straight, the establishment of new relations in the volume of production, diversification of low-priority products to adapt to market conditions, develop and implement a unified approach to scientific, technical and industrial activity. All these elements of electronic industry growth activity have to be realized according to export orientation of electronics.
4. Changing the geographical structure of electronic products export (from CIS, South-East Asia, Middle East countries to new markets that need a new research of the domestic electronic export receptivity in other regions). The quality of products increases and a new generation of electronic equipment starts to be developed and manufactured.
5. The priority of electronic industry in the world depends on certain factors, including its dynamics. The average annual growth rate of world electronic industry is more than 7%.
6. The process of export orientation of electronic companies must be ensured by an algorithm that begins with receiving an array of available information on the status, trends and prospects for foreign economic activity. Ukrainian electronic companies have no other alternative as export to ensure its survival. That is why export share is a key indicator in its activity showing its possibility to develop and survive.
7. The realization of transition steps of development base on the export orientation production for electronic industry enterprises in Ukraine will include: intensifying the development in high-tech manufactures integrated circuits and components, creating design centres for the development of new types of schemes and relevant information, innovative and investment infrastructure and the development of related industries – chemical, metallurgy of pure metals, technological device building, reducing the diversion of production and engineering personnel from the country.

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Cota de export în cazul tranziției industriei electronice din Ucraina

Rezumat

Lucrarea este dedicată cercetării capacității de export a întreprinderilor din industria electronică din Ucraina. Articolul investighează principalele aspecte ale activității și capacității de export în cazul întreprinderilor din industria electronică, tendințe și perspective ale capacității întreprinderilor naționale de a-și dezvolta exportul, precum și caracteristicile implementării activității de export. Având în vedere tendințele și factorii care afectează exportul, se propune un algoritm în vederea perfecționării capacității de export a întreprinderilor din industria electronică din Ucraina. Autorii accentuează ideea unei posibilități reale de creștere a industriei electronice doar cu ajutorul reorientării către export.