

“An institutional mechanism for integrating domestic manufacturing into global value chains”

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AN INSTITUTIONAL MECHANISM FOR INTEGRATING DOMESTIC MANUFACTURING INTO GLOBAL VALUE CHAINS

Abstract

The study reveals the peculiarities of modern global production development due to global value chains (GVCs) formation that allow both developing and developed countries to integrate successfully into international production networks. This research is aimed at identifying key factors responsible for the upstream movement of Ukraine through GVCs and determining locations for production capacities, as well as at developing an institutional mechanism for facilitating the successful integration of domestic producers into GVCs. To achieve this, a multiple linear regression reflecting the interrelation between manufacturing industry share in exports value added and the institutional and economic indicators is analyzed. Three scientific hypotheses are tested and two of them are verified. The multiple linear regression results disclose a significant impact of institutional factors on the country's ability to participate in GVCs and justify the first hypothesis, namely the higher the government effectiveness and regulatory quality are, the higher the manufacturing value added in exports is. Better governance and administrative functions performance enhance companies' export potential. The model also verifies the second hypothesis that emphasizes better ability to join GVCs with low and medium technology product than with a high technology one. The model outputs contradict the third hypothesis on the protectionism: high tariffs for imports significantly matter in exports promotion. However, this result should be considered while accounting for the global trend of trade liberalization and Ukraine's international agreements. The article proposes policy recommendations for improving the positions of Ukraine in GVCs.

Keywords

global value chains, institutional mechanism, international trade, industrial production, manufacturing, exports

JEL Classification

F15, L52, O19

INTRODUCTION

Recent studies widely recognize the global production fragmentation that has been going on in the last years (Brennan & Rakhmatullin, 2015). Phenomena such as offshoring and outsourcing have caused global changes in the global organization of production. The ability of countries to participate in world trade and to gain from transfers is closely connected with their ability to integrate into global value chains (GVCs). Companies with multi-stage production from the developed countries have organized some segments of the production processes in other countries, thus creating global value chains. At the same time, there is an opposite trend when developed countries resort to reduce GVCs via reshoring in an attempt to keep the high level of employment and to avoid barriers in international trade created by the protective tariff policies.

For developing countries, the enhancement of international trade through integration into GVCs reveals new opportunities. Kaplinsky and Morris (2001) emphasize that GVCs comprise all economic sec-

tors, have wide geographical allocation and determine the specialization of producers and countries at every stage of production. They are “organizational systems” at a country level integrated on a common technological base with wide use of information and communication technologies. Participation in value chains accelerates the technological development of a country and may have significant multiplication effects if the country penetrates into rent-rich links of chain what is rather complicated due to technological and institutional barriers created by the higher-links countries. Therefore, for transitional economies and, in particular, for Ukraine, increased participation in GVCs is a priority for economic policies due to the increased role of the state.

A state can provide opportunities of including and embedding of domestic industries into GVCs in terms of increasing global competition and new barriers for foreign producers. According to Cusolito et al. (2016), the main obstacles in joining the GVCs for private companies include access to financing, business climate, supply chain management, lack of staff skills, transport costs and capacity, inappropriate information and communication infrastructure, customs procedures and licensing requirements and quality standards. In the UNIDO report (2016), quotas, custom tariffs, ecological and medical standards are also added to the list. These institutional issues are to be reconciled by designing an institutional mechanism of facilitating the integration into GVCs.

Currently, Ukraine is heavily integrated into the European and other GVCs through the commodity exports and basic processed products that are being consumed directly by an importer or are then redirected to other countries. Such integration includes machinery (production of reactor parts for China, which produces reactors and sells them to Pakistan as a finished product), metallurgy (rolling) and agroindustry. Unfortunately, Ukrainian industry is poorly presented in the high technology GVCs, in particular, in electronic and automotive production. The production of finished or semi-finished products to sell or complement production in internal or external markets is dependent on imports of commodities and materials. At the same time, Ukraine has a great potential to integrate into higher links of chains with light industry products (suits), rubber and plastic manufactures, woodworking and furniture goods and some products of engineering, in particular, automotive and ICT (systems of industrial engineering). It is necessary to develop and launch the mechanism of institutional support to promote domestic production to international markets with the help of central and regional government institutions, as well as with increased competence of manufacturing companies.

Therefore, the aim of this research relates to theoretical consideration of the essence of institutional mechanism of domestic manufacturers’ integration into GVCs and development of recommendations on how to ensure the effectiveness of such a mechanism. The development and implementation of institutional mechanisms enhance the interconnections and accelerate communications between the chain participants through transformation of institutional phenomena into efficient models to join GVCs. Such mechanisms develop impulses to raise the technological level of production and create the financial and institutional support.

1. LITERATURE REVIEW

In economic studies, especially in Ukrainian ones, institutional mechanisms of integration into GVCs are insufficiently researched. Even less works are devoted to modelling and identification of impact factors for increasing participation of national industrial producers in GVCs in the higher links of the chain.

The concept of institutional mechanism is deeply explored in neoinstitutional studies. Scholars tend to concentrate on different aspects of this phenomenon, so the definitions also differ. An institutional mechanism is defined as a part of an economic mechanism that represents the interconnections between the institutions and the actors (Veretennikova & Omonov, 2017); or as a group of rules determining players’ strategies (Hurwitz,

1994; Veretennikova & Omonov, 2017). It ensures the formation, functioning and development of the system of institutions or the institutional environment (Zaloznaya, 2006). Commons (2017) considers institutional mechanisms through the prism of value-creating transactions. Kenneth Arrow (1974) presents an institutional mechanism as a resource allocation framework based on Pareto efficiency. Thévenot (2007) defined the institutional mechanism as coordination of actions appearing in its elements coherency to achieve the economic equilibrium. Ménard (2014) considers it being an association of partners for establishing an enterprise. According to North (1990), an institutional mechanism is more important than an economic one as it sets the rules of the game, according to which the economic agents behave, and thus determining their behavior and its results.

In spite of differences in views, they reflect different facets of the same phenomenon. In general, an institutional mechanism is a group of rules and regulations that create an institutional environment for transactions facilitating Pareto-efficient resource allocation and coordinated actions of market actors. The elements of institutional mechanism exercise the rules when embedding industrial companies into GVCs.

Institutional issues of integration into GVCs are considered in the scientific literature on micro-, meso-, and macro-levels.

Microeconomic aspects of institutional mechanism development lie within the formation of GVCs as network structures and include the problems of organizing the relevant enterprises, their cooperation, benefit distribution and implementation of optimal production technologies. Castells (1996) and Marsh (2012) denote the inevitability of network organization of enterprises in the global environment, as the achievement of the certain level of productivity and the competition are possible only within the global interdependent network. These are the new forms of global interaction, that is establishing the institutional subjects, organizations, rules and regulations with the gradual elimination of the inefficient institutional frameworks. New economic forms are built around the global network structures of capital, management and information. Therefore, the companies and, in-

creasingly, other institutions unite in networks of various configurations, and their structure manifests the deviation from traditional differences between big corporations and small business covering all sectors and economic groups organized on the geographical principle.

At a macro-level, this considers the public regulation of the access to international markets through licensing, technical and fiscal regulation, provision of efficient functioning of licensing institutions and exports promoting organizations. The World Economic Forum Report, "No Such Thing as a Commodity. Routes to higher value added for SMEs in developing and least developed countries" (Howe, Smith, & Verghese, 2018), emphasizes that the basic intention of the governments of the mentioned countries is to create the conditions to get around the raw material exports and to replace it with higher value-added products.

At the meso-level, Ménard (2014) considers intermediate organizational structures solving the problems of economic development strategies and reform project implementation. The mesoinstitutions are the key points, at which the informal rules of implementing reform strategies and reform projects in the institutional environment have historically been formed and filled (Kruglova, 2018). Such institutions are the core of institutional mechanism and include regulatory authorities, local commissions and committees, administrative regulations and protocols; they adapt the codes of conduct and distribute the rights of economic actors.

The development of international trade via participation in GVCs is just an intermediate goal (Sturgeon et al., 2009). The final goal is a positive effect of implementation of the GVCs-related trade rather than conventional trade. According to Raei, Ignatenko, and Mircheva (2019), Gereffi and Fernandez-Stark (2018), Antràs and Yeaple (2014), such an effect is an increase in income per capita, employment and productivity. It does not matter in which sector of the economy of the chain the company integrates. But the key role belongs to the institutional features such as contract enforcement, quality of infrastructure and governmental efficient support as the GVC development anticipates serious changes of a global production or-

ganization paradigm (Cattaneo et al., 2013). This includes the change of the management strategies at the different levels, from whole regions to companies. As in the liberalized environment import is an opportunity to access the most effective resources, no company can supply goods or services separately, and trade and domestic and foreign direct investments are to be considered as an organic whole.

The state is a leading institution in facilitating the inclusion in GVCs through exports and industrial policy development. The cases of various developed and transformational economies, as well as the results of a wide set of studies (Raei, Ignatenko, & Mircheva, 2019; OECD, WTO, and UNCTAD, 2013; Owens & Tavares, 2018) allow reconsidering the export policies in the context of inclusion in such chains or establishing one's own. Primarily, it has to stimulate the domestic producers to master the new goods production, to penetrate new markets and to expand their positions they are already active in.

The trade liberalization is a key for low income countries to successfully integrate into GVCs. Recent research (Deineko, 2018) determined that Ukraine, due to its recent trade agreements, reduced its opportunities for the trade protectionism. Joining the WTO constricted the choice of a non-tariff regulation, and the complexity and inability to meet the EU technical requirements do not allow complying with export quotas. Accordingly, it is more pragmatic to implement incentives for production capacity development with the purpose of import substitution and intensification of GVC integration, in particular, its high links.

Pérez-Villar and Seric (2014), Caraballo and Jiang (2015) consider the most influencing determinants of domestic export expansion such as foreign high-skill labor; primary education enrolment; patent applications of non-residents (as an impact of R&D expenditure on value added activities); tariffs, which represent the trade policy and the effects of globalization and trade agreements; labor productivity; output price level; institutional distance, which reflects the absolute difference between contract enforcement in the host and home countries; set of characteristics of the multinational firms and their place of origin (north or south).

The study seeks to identify the structure and connections of institutional mechanisms facilitating the improvement of domestic producers' positions in GVCs and to determine the impact factors of their performance through econometric analysis.

2. HYPOTHESES

The study argues that a certain debugged institutional mechanism of national producers' entry to international markets may accelerate the international trade with higher value-added goods between Ukrainian industrial enterprises and foreign consumers.

It is thus, hypothesized that:

- H1: A more effective institutional framework for promoting domestic industrial products to the GVCs directly affects the performance of manufacturing value added in export.*
- H2: A country producing low- and medium-level technology goods has better opportunities for joining the GVCs.*
- H3: The cost of protective measures for Ukraine is rather high in terms of integration into GVCs.*

To confirm or to reject the hypotheses, the following tasks are set: 1) to describe the existing institutional mechanism, its weaknesses and strengths, 2) to evaluate the impact of institutional, micro- and macroeconomic components of the mechanism on the export expansion for Ukraine using econometric modeling, 3) to analyze some Ukrainian evidence of export promotion to GVCs, and 4) to conclude the findings and develop policy recommendations.

3. RESEARCH METHODOLOGY

Developing an institutional framework of integration into GVCs requires the analysis of the existing foreign and domestic experience of state-led export promotion, its determinants, and procedures performed by different institutions participating in the promotion.

The approaches of the previous studies are used that investigate the linkages between domestic and multinational companies (Pérez-Villar & Seric, 2014) and effects of inclusion into GVCs on a decline in the shares of domestic value added in country's exports (Caraballo & Jiang, 2015) through institutional framework background. Those studies investigated cross-country evidence. Hence, the purpose of the current study is to identify the determinants of successful inclusion of Ukraine in the GVCs.

Significance and impact of factors that are part of an institutional mechanism of integrating into GVCs are measured through a multiple linear regression. The extent of a country's involvement in GVCs can be characterized using the indicator of manufacturing industry share in exports value added, proposed by Ischuk (2018):

$$K = \frac{E_{manuf} \cdot D_{manuf}}{V_{manuf}} \bigg/ \frac{E \cdot D}{V}, \quad (1)$$

where K – manufacturing industry share in exports value added, E_{manuf} – manufacturing exports, E – total exports, D_{manuf} – manufacturing value added, D – total value added, V_{manuf} – manufacturing output, and V – total output.

A multiple linear regression is built reflecting the interrelation between manufacturing share in exports value added, which represents the extent of inclusion of Ukrainian manufacturing in GVCs, and the institutional and economic indicators. The model is represented by the following equation:

$$K_t = \beta_0 + \beta_1 \cdot GE_{t-3} + \beta_2 \cdot RQ_{t-2} + \beta_3 \cdot LP_t + \beta_4 \cdot RD_t + \beta_5 \cdot CP_t + \beta_6 \cdot WT_t + \varepsilon_t, \quad (2)$$

where K – manufacturing share in exports value added, GE – government effectiveness, RQ – regulatory quality, LP – labor productivity per employee, RD – share of R&D expenditure in GDP, CP – capital productivity index, WT – weighted tariff represented by MFN weighted average.

The choice of the variables can be explained as follows.

The assessment of institutional auspiciousness for entering new markets represents the effects of a wide set of economic system parameters, e.g. the quality of fiscal regulation, geopolitical preferences, the trade agreements implemented, the level of property rights protection, the contract performance discipline, the confidence in courts and state policy stability. All of them can be combined and generalized in widely known World Bank composite indicators (World Governance Indicators), namely Government Effectiveness and Regulatory Quality (World Governance Indicators, 2019). The problem the current study faced is that the effects of the certain policy and government actions implementation come out with the time delay. The correlation analysis of different time lags showed that the government effectiveness affects primarily the manufacturing share in exports value added in three years and regulatory quality in two years. Therefore, both variables lagged were included.

Labor productivity per employee is a collective indicator of the quality of human resources management in the country. As it is mentioned in the OECD Skills Outlook (OECD, 2017), there is a bilateral dependence of labor productivity and the level of participation in GVCs. Simple correlations have shown that countries with higher rates of productivity growth also significantly increased their presence in the GVCs. At the same time, more fragmented industries like manufacturing also gain from participation in GVCs and increase their productivity when other costs (transportation, packaging, etc.) are low.

R&D is recognized as the upstream activity for participation in GVCs (Crisuolo & Timmis, 2017). The share of R&D expenditure in GDP is an indicator representing the quality of innovation policy that strengthens links between enterprises and research and educational institutions facilitating the transfers of knowledge for inclusion in GVCs. Certainly, success in GVCs anticipates huge investment in knowledge-bearing capital beyond R&D, in particular, in human capital, but this indicator shows the least result of the measures taken within the state innovation policy.

Capital productivity is a variable that represents capital-intensive industries and industries that absorbed large investments, and determines the

share of manufacturing value added in exports (Caraballo & Jiang, 2014). The positive correlation between the phenomena explains the prevalence of capital-intensive industries in GVCs in comparison with the internal markets, or country's inability to gain from capital-intensive industries.

Other obstacles are export and import tariffs. Thus, the Most-Favored Nation Tariffs (MFN), weighted average tariffs from WITS database (WITS, 2019) were included. Using this indicator, the significance of customs tariff policy for embedding into GVCs can be evaluated.

The regression results are presented below.

4. RESULTS AND DISCUSSIONS

The triadic nature of an institutional mechanism for integration into GVCs is performed at a macro-, meso- and micro-levels connected with communication, organization and financial links whose debugged functioning may decrease transaction costs of industrial companies while accessing the international markets. Its elements include institutions and organizational forms of export promotion like public exports and industrial strategies, regulatory public policy, trade agreements, customs and tax legislation, production standards, national trade associations, negotiations and dialogs at intergovernmental and intercorporate level, etc.

Kadochnikov (2015) defined the main links of an institutional mechanism for integration into GVCs, which can be referred to the macro-level:

1. Customs tariff policy aimed at establishing an efficient level of customs tariffs. When imported components for finished goods are an important source of increasing the competitiveness of export, the balance between import duties on finished goods and imported components used may be an optimality criterion.
2. Support of national producers participating in reducing costs, simplifying trade procedures and providing multiple unhindered border crossings. It means the adjustment of protec-

tionism model, import of components and materials stimulation in the cases connected with perspective export of finished products.

3. Negotiation agenda: agreements on procedures simplification, against counterfeit goods, on protecting intellectual property rights, on services, on reduction of barriers, cost reduction, etc.
4. Integrational agreements: on qualifying for preference in existing chains, as well as on the measures aimed at their protection (rules of origin, rules of competition).

Integration of Ukraine into GVCs may occur in two ways: 1) export expansion based on existing presence in GVCs (metallurgy, chemical industry, agriculture), or 2) based on the potential for increase in international competitiveness (pulp and paper industry, woodworking industry, engineering, light industry, creative industries).

The institutional mechanism for integrating into GVCs, according to Inshakov and Lebedeva (2002), has to solve the set of the following problems: integration of entities into one institution for joint activity through establishing common rules and statuses; division of agents of different institutions into those who share or disregard the rules and statuses; regulation of interaction between an institution and its agents according to the requirements; the conversion of new requirements in the actual routines; subordination and coordination of mutual relations between the entities of different institutions; awareness raising among the agents about accepted rules and about the opportunistic behavior; the control of rules, regulations, agreements and routine performance by public institutions. The goal of the institutional mechanism includes determining the direction of management processes in terms of limited resources by developing effective programs for the entire system and directly for every hierarchic level of public administration structure.

On a micro-level, companies that wish to be included in one or more GVCs must prepare a product that meets the standards and technical requirements of international and intercorporate agreements as well as to provide the efficient corporate

management, assessment of production capacities, and financial reserves. It implies the necessity for technical and economic upgrade or technological modernization allowing transition from low value added to high value-added production. These can be achieved by 1) improving the technological and production processes influencing the production costs; 2) enhancing or developing an innovation product with new consumer properties; 3) functional improvement or search of new niches in the value chains; 4) production diversification. These will provide the competitive benefits for entering into GVCs and for meeting the requirements and needs of the buyers from the higher links of the chain.

A state acts as the main regulator at the macro-economic level. In global environment, institutional mechanisms are heavily influenced by international economic processes, in particular, integrational. Therefore, the government controls compliance with the rules of international agreements and national legislation for international trade and protects the rights of economic entities in terms of the so called “social contract”. The state creates a legal field compatible with external market requirements, obligating the producers to organize their production in accordance with potential export opportunities. The fragmentation of production among independent entities spatially

distributed and responsible for different stages of production leads to the common approaches and increases the common production requirements. More and more often, national legislative bodies and international technical regulations require all GVC participants (from local producers to international wholesalers and retailers) to precisely comply with production standards.

The strategic planning of export-oriented industrial development and establishing the appropriate public institutions by the government are the starting point for an institutional mechanism at the macro-level. In Ukraine, this is an ongoing process guided by Ministry of Economic Development, Trade and Agriculture of Ukraine, Ministry of Foreign Affairs of Ukraine and their divisions, as well as by the Export Promotion Office. However, their functioning is not coordinated enough to stimulate domestic industries’ integration into GVCs. This negatively affects domestic industrial production and international trade of Ukraine (Figure 1).

It can be seen that, despite increasing priority of domestic industry export orientation and the signing the Ukraine – EU Association Agreement, the volumes of manufacture goods exports decreased from 2010 to 2017; however, in 2017 a slight growth is observed. In some manufacturing

Source: State Statistics Service of Ukraine (2019).

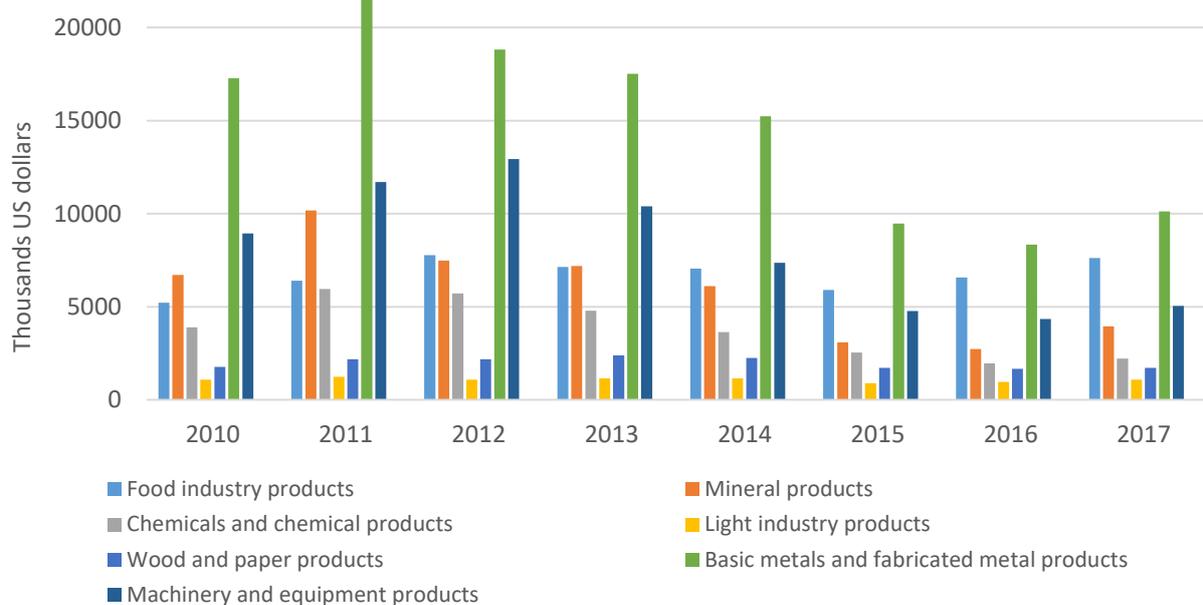


Figure 1. Ukrainian exports of industrial goods, 2010–2017

sectors (e.g., light industry, wood and paper industry, food industry), the decline and growth are not significant but these industries have comparative advantages in international markets and can potentially present higher processing goods.

The reasons of decline in exports lie in the 2008 global crisis, which resulted in total economy downturn, and the severance of economic relations with Russian Federation – the biggest trade partner – due to its military intervention in Ukraine. Figure 2 presents the breakdown of Ukrainian comparative advantages by industry value added share in GDP in comparison with the world economy.

The biggest negative gap in value added share in GDP can be observed in the period of 2013–2015. Owing to economic recovery, national currency rate stabilization and change in the vector of industrial policies, the value added of manufacturing started its growth, reducing the gap with the world's level to 2 percent in 2017.

Political will and lobbying at the international level play a significant role in export growth. Therefore, Ukrainian government initiated negotiations on trade agreements with Canada, Israel, Turkey, and China, and before that – with Singapore and Serbia. The negotiations with the two latter have been suspended, and they were successfully completed with Canada and Israel. Government uses

public-private partnership as a main tool for dealing with such initiatives – the government confirms the geoeconomic vector of international trade to the interests of domestic producers and organizes their participation in various meetings, exhibitions, etc. internationally.

Solving tactical problems with accessing the international markets is conducted at the regional and local levels. Public institutions of the permit system, the systems of administrative services, licensing, etc. at a regional level are characterized by low institutional capability as they often work beyond deadlines, and ask for additional documents, not prescribed by law, etc. The decentralization reform may partially facilitate the improvement of functional performance of regional authorities but at the same time their activity has to be strictly coordinated by central government.

Since 2014, Ukrainian government has been increasing the volume of public support for regional development. It includes road, transport and warehouse infrastructure development, whose funding raised to UAH 41.1 bln in 2019, and funding for environment security and sustainable development, respectively, UAH 1.1 bln, and regional development got UAH 19.2 bln, etc. The implementation of the provisions of the Association Agreement with the EU considers new understanding of the regional policy as the development policies, economic and investment activity stimulation, enhancement of

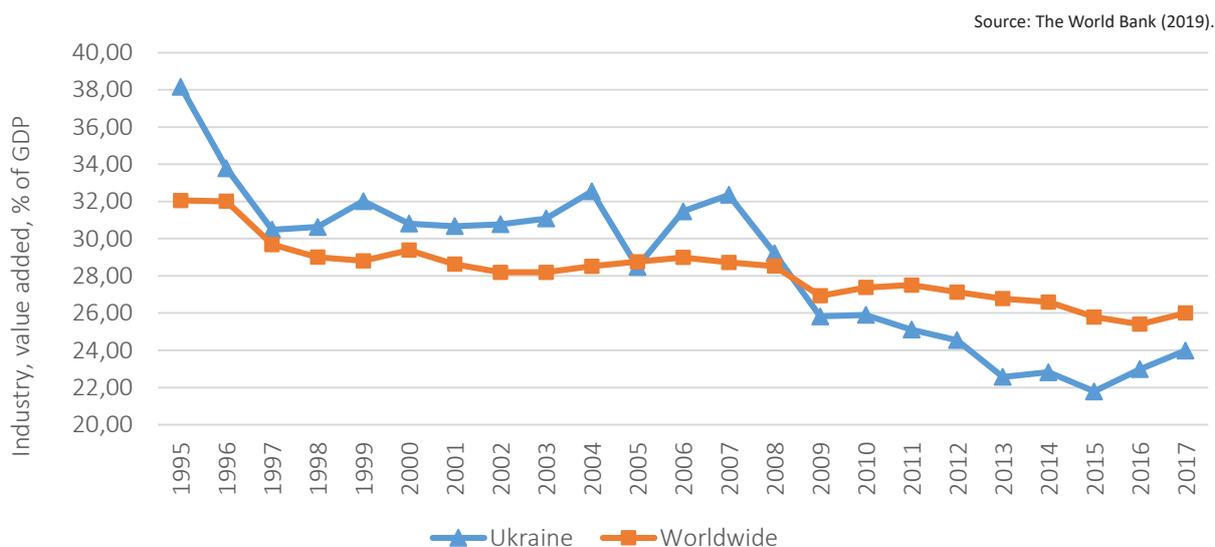


Figure 2. Comparative advantages in value added share in GDP of Ukraine and worldwide, 1995–2017

Table 1. Data for regression analysis

Source: Worldwide Governance Indicators (2019), State Statistics Service of Ukraine (2019), WITS (2019), the World Bank (2019).

Year	<i>K</i> – manufacturing industry share in exports value added, %	<i>GE*</i> – government effectiveness, points	<i>RQ**</i> – regulatory quality, points	<i>LP</i> – labor productivity per employee, UAH (in 2010 constant prices)	<i>RD</i> – share of R&D expenditure in GDP, %	<i>CP</i> – capital productivity index, % (2000 = 100)	<i>WT</i> – MFN weighted average, %
2004	42.1	28.13	30.1	50.95	1.03	125.9	3.99
2005	44.9	30.1	30.1	51.539	0.99	125	3.99
2006	47.7	32.14	39.41	55.306	0.91	128.1	4.13
2007	47.9	32.51	32.35	59.351	0.86	130.6	4.69
2008	42.9	32.35	31.86	60.487	0.84	127	4.69
2009	39.2	36.59	36.41	53.316	0.86	105.2	2.47
2010	37.8	29.13	33.01	56.274	0.75	107.1	2.9
2011	37.5	27.18	32.06	59.193	0.65	106.9	2.42
2012	34.7	21.53	33.97	59.241	0.67	100.8	2.57
2013	30.6	24.4	29.86	59.063	0.7	95.9	2.78
2014	32.8	21.33	29.86	58.982	0.6	89.5	2.65
2015	33.2	32.23	30.33	58.494	0.55	79.2	2.46
2016	33.6	31.28	29.33	60.534	0.48	79.6	2.46
2017	34.4	39.9	29.81	62.525	0.45	79.3	2.73

Note: * 3-year lag, ** 2-year lag.

innovation and job creation. Moreover, it establishes the mechanisms and possibilities of cooperation between Ukrainian communities and their partners in Europe. That indirectly contributes to the foundations for implementing other spheres of the Agreement, particularly those concerning the establishment of free trade area, environmental, agricultural, energy and transport cooperation.

The coordination of functions and institutional support from regional authorities and central governments will result in a synergy for integrating the domestic producers into global value chains.

Figure 3 reflects all the interconnections and interactions described above at each level of institutional mechanism.

To determine the most influential factors of increasing manufacturing share in export value added under the institutional mechanism, the empirical research is conducted, and a linear regression model is built. The series of the indicators for 2004–2017 for Ukraine are calculated using the data of State Statistics Service of Ukraine (2019) and other data, which are presented in Table 1.

In the model, the unstandardized values are used. The descriptive statistics and correlation matrix are presented in Table 2.

The model is adequate at a 0.05 probability level. High value of R^2 with significant t-statistics (Table 3) shows the model quality – the independent variables explain 95.7% of the variation of manufac-

Table 2. Descriptive statistics and correlation matrix

Source: Own calculations.

Measures	Value	Correlation matrix	<i>K</i>	<i>GE, t-3</i>	<i>RQ, t-2</i>	<i>LP, t</i>	<i>RD, t</i>	<i>CP, t</i>	<i>WT, t</i>
Multiple <i>R</i>	0.988	<i>K</i>	1	–	–	–	–	–	–
R^2	0.977	<i>GE, t-3</i>	0.314	1	–	–	–	–	–
R^2 adjusted	0.957	<i>RQ, t-2</i>	0.491	0.166	1	–	–	–	–
Standard error	1.192	<i>LP, t</i>	-0.473	0.029	-0.268	1	–	–	–
Observations	14	<i>RD, t</i>	0.792	-0.014	0.387	-0.805	1	–	–
F ($\alpha = 0.05$)	48.64	<i>CP, t</i>	0.902	0.000	0.430	-0.535	0.914	1	–
Significance F	0.000023	<i>WT, t</i>	0.856	0.180	0.172	-0.263	0.719	0.854	1

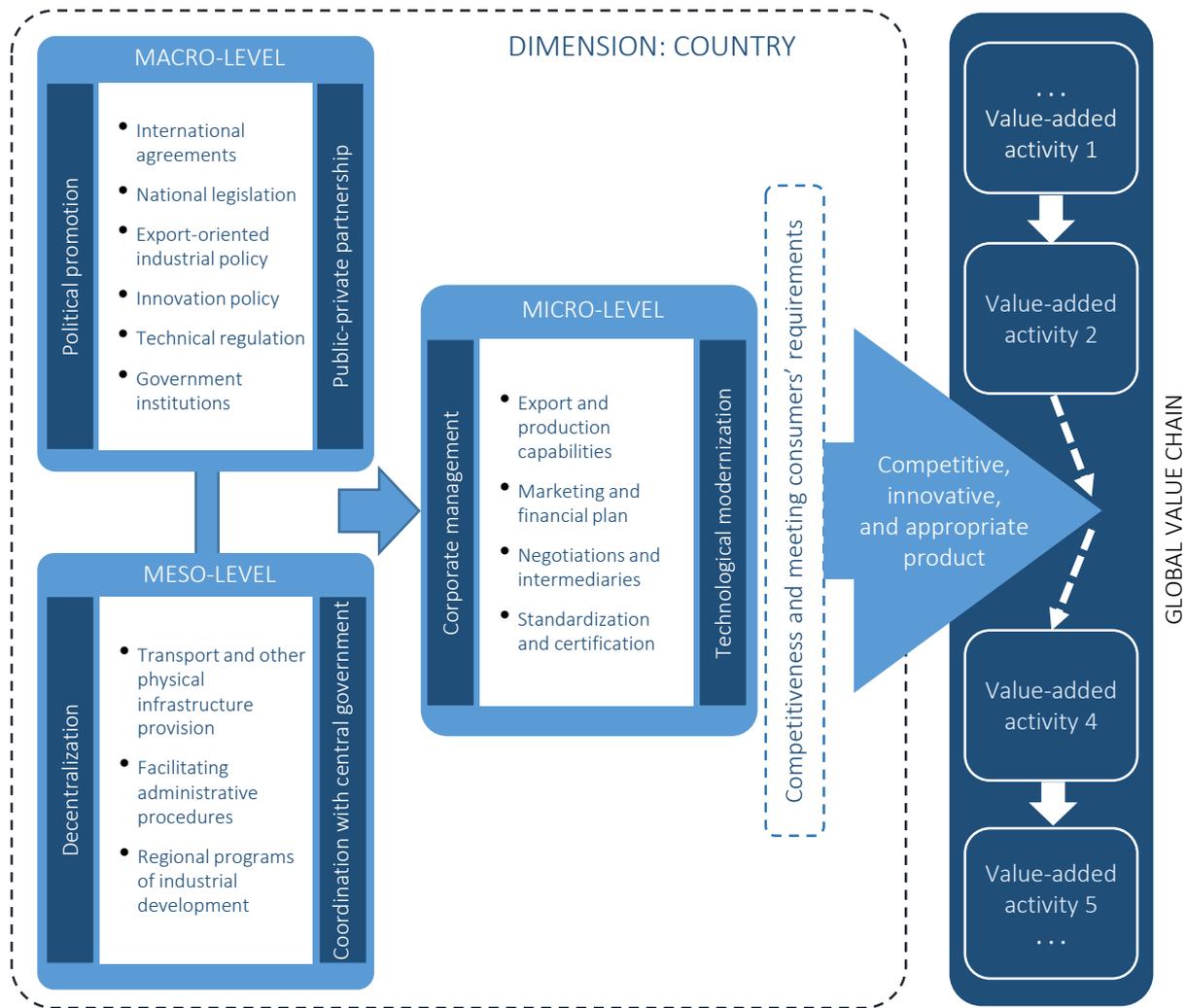


Figure 3. Institutional mechanism of country's integration into global value chains

turing share in export value added. The regression results are presented in Table 3.

The results of the modelling can be presented as follows:

$$K_t = 76.87 + 0.21 \cdot GE_{t-3} + 0.33 \cdot RQ_{t-2} - 1.27 \cdot LP_t - 46.17 \cdot RD_t + 0.39 \cdot CP_t + 3.45 \cdot WT_t + \varepsilon_t \quad (3)$$

The model output justifies the first hypothesis. The higher the government effectiveness and regulatory quality are, according to the expert estimations, the higher the manufacturing share in exports value added is. Access to new markets and integration into GVCs are followed by some obstacles the companies should overcome. One of the priority tasks includes technical requirements to products and their components. The certification, licensing and other permitting procedures require the state to provide

Table 3. Regression results

Source: Own calculations.

Variables	Value	S.D.	t-statistics	P-value	Significance ($\alpha = 0.05$)
Intercept	76.87	21.314	3.61	0.0087	Significant
Government effectiveness, $t-3$	0.21	0.076	2.78	0.027	Significant
Regulatory quality, $t-2$	0.33	0.154	2.13	0.071	Significant ($\alpha = 0.10$)
Labor productivity per employee, t	-1.27	0.332	-3.84	0.006	Significant
Share of R&D expenditure in GDP, t	-46.47	12.286	-3.76	0.007	Significant
Capital productivity index, t	0.39	0.085	4.60	0.002	Significant
MFN weighted average, t	3.45	1.103	3.12	0.017	Significant

an appropriate legislation to raise industrial production standards both for domestic and international markets, especially the EU. Therefore, the improvement of public administration quality, which is stipulated by its institutional capabilities to launch the institutional mechanism of export to GVCs promotion, is the main task in terms of implementing the Ukraine – EU Association Agreement.

Both variables – GE and RQ – are included in the model with a lag. This is because the institutional processes are inertial. It will take a while to see the market's reaction to an adoption of a new law, and to see positive effects from establishing a new institution.

The second hypothesis concerns the assumption that countries that supply raw materials and basic processed products to the international market can easier join the lower links of GVC as they have absolute advantages in their production. If country starts exporting high technology products, the degree of competition rises and hinders the inclusion to GVCs and consumer markets. The model observes this effect as negative coefficients for labor productivity and R&D share in the GDP. Increase in labor productivity, besides other reasons, is due to improvements in technology and capital intensity (Santacreu, 2015). R&D expenditures converted into new technologies, particularly into ICT, facilitate the increase in labor productivity in high-tech sectors (Grishnova & Kostenko, 2014), but the same is doubtful for medium-tech and low-tech sectors. In addition, the negative correlation between manufacturing value added in exports and R&D expenditure reproduces the same result as obtained in Pérez-Villar and Seric (2014). They explain this in two ways: the first is that firms developing and exploiting new technologies choose rather to bosom the features of their production process to avoid its replication by other domestic firms, but this is not the case of Ukraine because of lack of breakthrough technologies that have been recently invented. The second interpretation for the negative coefficient is that the technological and quality product features might not meet the requirements of more sophisticated semifinished products required by companies participating in a certain GVC and thus providing intensive R&D activities.

The capital productivity positively affects the integration into GVCs. The higher the capital productivity

index in industry is, the higher the share of manufacturing in export value added is. This result means the capital-intensive industries better integrate into GVCs than into domestic value chains (Caraballo & Jiang, 2015; Gereffi, 1994). Therefore, the development of capital-intensive industries may stipulate better penetration of Ukrainian industrials to GVCs.

The world trade nowadays is greatly influenced by protectionist sentiments in countries where the recovery from the 2008 crisis is slow, and whose positions in the international markets weaken due to the increased global competition. Such a vector partly relates to the needs of European industrials manifested to European Commission at the beginning of 2019, and also is part of export policy in China, USA, etc. At the same time, countries tend to expand mutually beneficial trade cooperation by creating custom unions (Russian Federation) or free trade areas (European Union). The role of customs tariffs as the exports public policy tools is declining; and the trade liberalization is mostly provided by the reduction of administrative barriers. Custom tariffs represent the result of trade policy and regulate exports and imports affecting integration into GVCs. The positive correlation between the average MFN tariffs and manufacturing share in export value added demonstrates that the countries with protectionist policies indeed gain, to a certain degree, from international trade. At the same time, decreased protection and low average tariffs will decrease the share of manufacturing in export value added.

The analysis of elasticity (E) allowed for making some conclusions concerning the most influencing factors of increasing the share of manufacturing in exports value added. The labor productivity ($E = -1.90$) and capital productivity ($E = 1.07$) have the greatest impact on the share of manufacturing in exports value added. The inelastic but positive change in manufacturing exports value added is caused by custom tariffs ($E = 0.29$), regulatory quality ($E = 0.27$) and government effectiveness ($E = 0.16$).

Thereby, the regression results verified hypotheses $H1$ and $H2$. Nevertheless, they rejected the hypothesis about the need of the complete renouncement from protectionism for better integration into higher levels of GVCs. These findings become a source for policy recommendations and conclusion.

CONCLUSION

This paper has examined the relationship between the level of an institutional mechanism development and the potential of domestic industrials to be included in GVCs.

The structure of such an institutional mechanism covers three levels, namely micro- (corporate), me- so- (regional) and macro-levels (national). Each of them provides efficient promotion of industries to GVCs due to its functions and possibilities. The main condition is the coordination of their functioning through institutions such as public-private partnerships, consulting, regulation and financial support to maximize the opportunities of domestic producers to integrate into GVCs.

The multiple linear regression is built to confirm the three hypotheses concerning the impact of institutional factors on manufacturing share in export value added as an indicator of Ukrainian industry integration into GVCs. Thus, the study provides evidence that the better governance and administrative functions performance enhance companies' exports potential.

It was also proved that countries supplying raw materials and basic processed products to the international markets integrate easier into the lower links of GVCs as they have more advantages in their production. If a country wants to be included into the higher links of GVCs, high competition is the main obstacle to overcome, with others being technical requirements, licensing, and protective custom tariffs. In addition, a certain level of protectionism contributes to manufacturing share in export value added growth.

The research results make it possible to identify the priority directions of public institutional support for enhancing the Ukrainian export oriented industries development.

Firstly it can be the creation of a system of institutional support for Ukrainian manufacturing that includes: 1) legislation improvement; 2) consequent introduction of standards prevalent on the priority markets and in consumer countries; 3) strengthening the institutional capabilities of the central and regional authorities and institution building by creating the thematic online platforms, associations, or consulting entities; 4) implementing regional training programs for staff to obtain new skills and competences to enhance product innovativeness and rapid introduction of new technologies, in particular, smart technologies.

The second may be a transition from import substitution to high technology production within the country, as well as an expansion of domestic markets and import supplement. To this end, facilitation of the access to import components and materials that could stimulate the competitiveness of domestic producers, as well as keeping specific production niches while integrating into the final stages of GVCs, may be necessary. For the low technology industries, a stimulation of export from the industries with significant capacities should be included, and it will facilitate the inclusion into the initial GVC stages. It will provide more efficient integration of the country into GVCs and increase in value added of the country in other countries' exports.

Thirdly, customs tariffs play a great role in the value formation of finished goods. Depending on how many times a product crosses the borders of different countries until it acquires the properties of a final consumption product, custom tariffs paid accumulate in the value. And though the protectionist measures cannot be implemented completely due to international trade agreements with the WTO and the EU, countries introduce high tariffs and quotas for some goods. Therefore, agreements are to be made with the countries with large manufacturing hubs around which global value chains are located. This enhances the institutional support system transformation to promote better domestic producers into GVCs, as well as to get more competitive advantages in the international market.

REFERENCES

1. Antràs, P., & Yeaple, S. (2014). Multinational firms and the structure of international trade. *Handbook of International Economics*, 4, 55-130. <https://doi.org/10.1016/B978-0-444-54314-1.00002-1>
2. Arrow, K. J. (1974). General Economic Equilibrium: Purpose, Analytic Techniques, Collective Choice. *American Economic Review*, 64(3), 253-272. Retrieved from https://www.jstor.org/stable/1808881?seq=1#page_scan_tab_contents
3. Brennan, L., & Rakhmatullin, R. (2015). *Global Value Chains and Smart Specialization Strategy. Thematic Work on the Understanding of Global Value Chains and Their Analysis within the Context of Smart Specialization*. <https://doi.org/10.2791/44840>
4. Caraballo, J., & Jiang, X. (2015). *Capturing the Gains in Global Value Chains: Trade in Intermediates and Value Added Erosion* (23 p.). Retrieved from <https://pdfs.semanticscholar.org/b2d2/f3baac29660284f63f30106afd-91b56a19eb.pdf>
5. Castells, M. (1996). *The Rise of the Network Society*. In *The Information Age: Economy, Society and Culture*, 1. Cambridge, Massachusetts, Oxford, UK: Blackwell. Retrieved from <https://dl.acm.org/citation.cfm?id=518096>
6. Cattaneo, O., Gereffi, G., Miroudot, S., & Taglioni, D. (2013). *Joining, upgrading and being competitive in global value chains: a strategic framework* (Policy Research Working Paper, No. WPS 6406, 52 p.). The World Bank. Retrieved from <http://documents.worldbank.org/curated/en/254001468336685890/Joining-upgrading-and-being-competitive-in-global-value-chains-a-strategic-framework>
7. Commons, J. R. (2017). *Institutional Economics: Its Place in Political Economy* (400 p.). New York: Routledge. Retrieved from <https://www.amazon.com/Institutional-Economics-Place-Political-Economy/dp/0887387977>
8. Criscuolo, C., & Timmis, J. (2017). The Relationship Between Global Value Chains and Productivity. *International Productivity Monitor*, 32, 61-83. Retrieved from http://www.csls.ca/ipm/32/Criscuolo_Timmis.pdf
9. Cusulito, A., Safadi, R., & Taglioni, D. (2016). *Inclusive Global Value Chains. Policy Options for Small and Medium Enterprises and Low-Income Countries* (114 p.). OECD, World Bank Group. Retrieved from <https://openknowledge.worldbank.org/bitstream/handle/10986/24910/9781464808425.pdf?sequence=2>
10. Deineko, L. et al. (2018). *Розвиток промисловості для забезпечення зростання та оновлення української економіки [Rozvytok promyslovi dlia zabezpechennia zrostannia ta onovlennia ukraïnskoi ekonomiky]* (158 p.). Institute for Economics and Forecasting of NAS of Ukraine. Retrieved from <http://ief.org.ua/docs/sr/301.pdf>
11. Gereffi, G. (1994). *The organization of buyer-driven global commodity chains: How U.S. retailers shape overseas production networks* (pp. 95-122). In G. Gereffi & M. Korzeniewicz (Eds.). Westport, CT: Praeger. Retrieved from https://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/11457/1994_Gereffi_Role%20of%20big%20buyers%20in%20GCCs_chapter%205%20in%20CC%26GC.pdf?sequence=1
12. Gereffi, G., & Fernandez-Stark, K. (2018). *Global Value Chains Analysis* (2nd ed.). *Global Value Chains and Development: Redefining the Contours of 21st Century Capitalism*, 305-342. Cambridge: Cambridge University Press. <https://doi.org/10.1017/9781108559423>
13. Grishnova, O. A., & Kostenko, T. O. (2014). Information technologies within the system of novel factors of labour productivity growth: trends and paradoxes. *Actual Problems of Economics*, 2(152), 462-469 Retrieved from http://irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/ape_2014_2_55.pdf
14. Howe, J., Smith, T. M., & Verghese, A. S. (2018). *No Such Thing as a Commodity. Routes to higher value added for SMEs in developing and least developed countries* (23 p.). (World Economic Forum) Retrieved from http://www3.weforum.org/docs/WEF_No_Such_Thing_as_a_Commodity.pdf
15. Hurwitz, L. (1994). Economic design, adjustment processes, mechanisms, and institutions. *Economic Design*, 1(1), 1-14. Retrieved from <https://link.springer.com/article/10.1007%2FBF02716611>
16. Inshakov, O. V., & Lebedeva, N. N. (2002). Типология и классификация институциональных механизмов [Tipologiya i klasifikatsiya institsionalnykh mekhanizmov]. *Ekonomika rozvitiya regiona: problemy, poiski, perspektivy: Ezhegodnik*, 1. Volgograd: VolGU.
17. Ischuk, S. (2018). Structural advantage of the Ukraine industry: comparison at the macro and meso levels. *Economic Journal of Lesia Ukrainka Eastern European National University*, 2(14), 47-56. <https://doi.org/10.29038/2411-4014-2018-02-47-56>
18. Kadochnikov, P. A. (2015). Перспективные вопросы расширения участия России в глобальных цепочках добавленной стоимости [Perspektivnyye voprosy rasshireniya Rossii v globalnykh tsepochkakh dobavlennoy stoimosti]. *Rossiyskiy vneshneekonomicheskii vestnik*, 2, 8-13. Retrieved from <https://ideas.repec.org/a/scn/018481/15956496.html>
19. Kaplinsky, R., & Morris, M. (2001). *A Handbook for Value Chain Research*. The International Development Research Centre. Retrieved

- from <http://www.prism.uct.ac.za/Papers/VchNov01.pdf>
20. Kruglova, M. S. (2018). Claude Menard's meso-institution theory and its application in the institutional design. *Journal of Institutional Studies*, 10(3), 49-57. <http://dx.doi.org/10.17835/2076-6297.2018.10.3.049-057>
 21. Marsh, P. (2012). *New Industrial Revolution: consumers, globalization and the end of mass production* (320 p.). Yale University Press Publication.
 22. Ménard, C. (2014). Embedding organizational arrangements: towards a general model. *Journal of Institutional Economics*, 10(4), 567-589. <https://doi.org/10.1017/S1744137414000228>
 23. North, D. (1990). *Institutions, institutional change and economic performance* (164 p.). Cambridge: Cambridge University Press.
 24. OECD. (2017). *OECD Skills Outlook 2017: Skills and Global Value Chains*. OECD Publishing, Paris. <http://dx.doi.org/10.1787/9789264273351-en>
 25. OECD, WTO, UNCTAD. (2013). *Implications of Global Value Chains for Trade, Investment, Development and Jobs* (29 p.). Retrieved from https://unctad.org/en/PublicationsLibrary/unctad_oecd_wto_2013d1_en.pdf
 26. Owens, J., & Tavares Romero J. S. (2018). *Global Value Chain Policy Series. Taxation* (14 p.). World Economic Forum. Retrieved from http://www3.weforum.org/docs/WP_Global_Value_Chain_Policy_Series_Taxation_report_2018.pdf
 27. Pérez-Villar, L., & Seric, A. (2014). *Multinationals in Sub-Saharan Africa: Domestic Linkages and Institutional Distance* (28 p.) (Kiel Working Papers, No. 1893). Kiel Institute for the World Economy. Retrieved from <http://hdl.handle.net/10419/88765>
 28. Raei, F., Ignatenko, A., & Mircheva, B. (2019). *Global Value Chains: What are the Benefits and Why Do Countries Participate?* (31 p.). (IMF Working Paper WP/19/18). Retrieved from <https://www.imf.org/en/Publications/WP/Issues/2019/01/18/Global-Value-Chains-What-are-the-Benefits-and-Why-Do-Countries-Participate-46505>
 29. Santacreu, A. M. (2015). Measuring Labour Productivity: Technology and the Labour Supply. *Economic Synopses*, 5. Retrieved from <https://research.stlouisfed.org/publications/economic-synopses/2015/02/27/measuring-labor-productivity-technology-and-the-labor-supply/>
 30. State Statistics Service of Ukraine. (2019). Official site. Retrieved from <http://www.ukrstat.gov.ua/>
 31. Sturgeon, T., Memedovic, J., Van Biesebroek, & Gereffi, G. (2009). Globalization of the Automotive Industry: Main Features and Trends. *International Journal of Technological Learning, Innovation and Development*, 2(1-2), 7-24. Retrieved from <https://ideas.repec.org/a/ids/ijtlid/v2y2009i1-2p7-24.html>
 32. The World Bank. (2019). *Industry (including construction), value added (% of GDP)*. Retrieved from <https://data.worldbank.org/indicator/NV.IND.TOTL.ZS>
 33. Thévenot, L. (2007). The plurality of cognitive formats and engagements: Moving between the familiar and the public. *European Journal of Social Theory*, 10(3), 413-427. <https://doi.org/10.1177%2F1368431007080703>
 34. UNIDO. (2016). *Industrial Development Report 2016. The Role of Technology and Innovation in Inclusive and Sustainable Industrial Development* (49 p.). Retrieved from https://www.unido.org/sites/default/files/2015-12/EBOOK_IDR2016_FULLREPORT_0.pdf
 35. Veretennikova, A., & Omonov, Zh. (2017). Концепция институционального механизма в экономической теории [Konceptsiya institutsionalnogo mekhanizma v ekonomicheskoy teorii]. *Journal of Economic Theory*, 2, 156-162. Retrieved from <http://www.uiec.ru/content/zhurnal2017/JET/02i2017i14iVeretennikova.pdf>
 36. The World Bank. (2019a). *WITS (World Integrated Trade Solution)*. Retrieved from <https://wits.worldbank.org/>
 37. The World Bank. (2019b). *Worldwide Governance Indicators*. Retrieved from <https://info.worldbank.org/governance/wgi/#reports>
 38. Zaloznaya, G. M., & Taspaev, S. S. (2006). Роль институционального механизма в функционировании российской экономики [Rol institutsionalnogo mekhanizma v funktsionirovanii rossiyskoy ekonomiki]. *Izvestiya Orenburgskogo gosudarstvennogo agrarnogo universiteta*, 3(11), 114-118. Retrieved from <https://orensau.ru/ru/obuniversitete/12/4781-izvestiya-orenburgskogo-gosudarstvennogo-agrarnogo-universiteta>