


**TRANSFORMATION OF GLOBAL VALUE CHAINS IN THE CONTEXT OF MODERN  
MACROECONOMIC SHOCKS**

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p><b>Received</b> 20 February 2023</p> <p><b>Accepted</b> 08 May 2023</p>	<p><b>Purpose:</b> The aim of this study is to examine the concept of global value chains (GVCs) in terms of the distribution of benefits among participating countries by deepening the international division of labor and including geographically distant and differently developed countries.</p>
<p><b>Keywords:</b></p> <p>Global Value Chains; Value Added; Reformatting Global Value Chains; Supply Chains; Production Localization.</p>	<p><b>Theoretical framework:</b> The article emphasize that the involvement of countries in GVCs, along with benefits, has several risks associated with both endogenous and exogenous factors.</p>
	<p><b>Design/methodology/approach:</b> The authors analyzed GVC studies and used such research methods as a case study and factor, comparative, and structural analysis. Russian and international statistical data were used as the study materials.</p> <p><b>Findings:</b> The results of the analysis indicate that exogenous factors related to the COVID-19 pandemic and geopolitical tensions have led to the breakdown of GVCs and increased their instability. To address these issues, the authors suggest increasing the domestic value added in industries that rely heavily on foreign resources, reforming GVCs by localizing partnerships through deglobalization processes, and seeking out new trading partners.</p> <p><b>Research, Practical &amp; Social implications:</b> The study authors propose to make changes to the current structure of GVCs. This can help minimize negative consequences for the economy through the introduction of practices aimed at increasing the number of suppliers, expanding sales markets, and optimizing production processes.</p> <p><b>Originality/value:</b> The value of the study lies in its identification of both the advantages and challenges of GVC participation for countries. It also offers practical solutions to enhance the resilience of GVCs, making the study results relevant for policymakers, businesses, and industries involved in GVCs.</p> <p>Doi: <a href="https://doi.org/10.26668/businessreview/2023.v8i5.1869">https://doi.org/10.26668/businessreview/2023.v8i5.1869</a></p>

**TRANSFORMAÇÃO DAS CADEIAS GLOBAIS DE VALOR NO CONTEXTO DOS CHOQUES  
MACROECONÔMICOS MODERNOS**

**RESUMO**

**Objetivo:** O objetivo deste estudo é examinar o conceito de cadeias globais de valor (GVCs) em termos de distribuição de benefícios entre os países participantes, aprofundando a divisão internacional do trabalho e incluindo países geograficamente distantes e com diferentes desenvolvimentos.

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**Referencial teórico:** O artigo enfatiza que o envolvimento dos países nas CGVs, juntamente com os benefícios, tem vários riscos associados a fatores endógenos e exógenos.

**Desenho/metodologia/abordagem:** Os autores analisaram estudos de GVC e usaram tais métodos de pesquisa como estudo de caso e análise fatorial, comparativa e estrutural. Dados estatísticos russos e internacionais foram usados como materiais de estudo.

**Resultados:** Os resultados da análise indicam que fatores exógenos relacionados à pandemia do COVID-19 e às tensões geopolíticas levaram ao colapso das CGVs e aumentaram sua instabilidade. Para abordar essas questões, os autores sugerem aumentar o valor agregado doméstico em indústrias que dependem fortemente de recursos estrangeiros, reformar as cadeias globais de valor por meio da localização de parcerias por meio de processos de desglobalização e buscar novos parceiros comerciais.

**Pesquisa, implicações práticas e sociais:** Os autores do estudo propõem fazer alterações na estrutura atual das CGVs. Isso pode ajudar a minimizar as consequências negativas para a economia por meio da introdução de práticas que visam aumentar o número de fornecedores, ampliar os mercados de venda e otimizar os processos produtivos.

**Originalidade/valor:** O valor do estudo reside na identificação das vantagens e desafios da participação nas CGVs para os países. Ele também oferece soluções práticas para aumentar a resiliência das CGVs, tornando os resultados do estudo relevantes para formuladores de políticas, empresas e indústrias envolvidas nas CGVs.

**Palavras-chave:** Cadeias Globais de Valor, Valor Adicionado, Reformatando Cadeias Globais de Valor, Redes de Fornecimento, Localização da Produção.

## TRANSFORMACIÓN DE LAS CADENAS DE VALOR GLOBALES EN EL CONTEXTO DE LAS CHOQUES MACROECONÓMICOS MODERNOS

### RESUMEN

**Propósito:** El propósito de este estudio es examinar el concepto de cadenas globales de valor (CGV) en términos de distribución de beneficios entre los países participantes, profundizando la división internacional del trabajo e incluyendo países geográficamente distantes con diferentes desarrollos.

**Marco teórico:** El artículo enfatiza que el involucramiento de los países en las CGV, junto con los beneficios, tiene varios riesgos asociados a factores endógenos y exógenos.

**Diseño/metodología/enfoque:** Los autores revisaron los estudios de GVC y utilizaron métodos de investigación como el estudio de casos y el análisis factorial, comparativo y estructural. Se utilizaron datos estadísticos rusos e internacionales como materiales de estudio.

**Resultados:** Los resultados del análisis indican que factores exógenos relacionados con la pandemia de COVID-19 y las tensiones geopolíticas llevaron al colapso de las CGV y aumentaron su inestabilidad. Para abordar estos problemas, los autores sugieren aumentar el valor agregado nacional en industrias que dependen en gran medida de recursos extranjeros, reformar las cadenas de valor globales a través de la localización de asociaciones a través de procesos de desglobalización y buscar nuevos socios comerciales.

**Implicaciones sociales, prácticas y de investigación:** Los autores del estudio proponen realizar cambios en la estructura actual de las cadenas de valor mundiales. Esto puede ayudar a minimizar las consecuencias negativas para la economía mediante la introducción de prácticas destinadas a aumentar el número de proveedores, ampliar los mercados de venta y optimizar los procesos de producción.

**Originalidad/Valor:** El valor del estudio radica en identificar las ventajas y desafíos de participar en las CGV para los países. También ofrece soluciones prácticas para aumentar la resiliencia de las cadenas de valor mundiales, lo que hace que los resultados del estudio sean relevantes para los responsables políticos, las empresas y las industrias involucradas en las cadenas de valor mundiales.

**Palabras clave:** Cadenas Globales de Valor, Valor Agregado, Reformato de Cadenas Globales de Valor, Cadenas de Suministro, Ubicación de Producción.

### INTRODUCTION

The recent decades of world economic development are characterized by new forms of international relations based not only on trade relations but also on inter-country cooperation through participation in global value chains (GVCs). GVCs differ from traditional international

trade since their participants import not only for domestic consumption but also for subsequent re-export (Fahad, Abdurrazaq, 2022). The relationships between companies in chains are long-term, and the chains focus mainly on high-tech and knowledge-intensive industries: pharmaceuticals, automotive, computer, electronic, and optical equipment. The participation of countries in GVCs reflects the degree of their integration into the global economy, characterizing the structure of the economy and foreign trade, as well as the country's competitive advantages.

At the present stage of development, several exogenous factors have emerged that have a direct or indirect impact on all countries involved in international trade through participation in GVCs. Such factors include trade wars, protectionist sentiments, the COVID-19 pandemic, and the geopolitical situation in the world. The ongoing events have revealed the vulnerability of the current system of GVCs and supplies focused on their smooth operation (Ali et al., 2023).

Increasing risks associated with disruptions and in some cases gaps in the supply of products in the chain of one country lead to a reduction in intermediate imports and exports of finished products by its trading partners that are participants in this global chain.

Until recently, scientific and periodical literature has been mentioning that the influence of external shocks to a greater extent affects small economies actively involved in the international division of labor. In modern studies, more and more attention is paid to the susceptibility of all participants of GVCs to such shocks, regardless of the size of their economies.

Thus, the topic is relevant since it addresses the vulnerability of GVCs and seeks ways to increase their resilience to external challenges. The prospects for transforming world trade within the framework of GVCs are considered by governments and international organizations.

The objective of the research is to analyze the impact of exogenous factors, such as the COVID-19 pandemic and geopolitical situations, on global value chains (GVCs) and the risks of increasing their instability in the future.

## **LITERATURE REVIEW**

For the first time, the GVC term was introduced by F. Gluck (1980) and R. Buaron (1981) who studied the process of creating value within an organization. Accordingly, they proposed to consider it as a set of different types of activities that contribute to the formation of overall economic results.

Later, the idea was developed by M. Porter (1979) who drew attention to the company's task of building relationships with suppliers and consumers to ensure its competitiveness. By 1985, the scholar had transformed it into the concept of GVC as a tool for the strategic analysis of the company's activities (Porter, 1985). This concept was supported by many scholars involved in the study of economic development, including G. Gereffi and M. Korzeniewicz (1994), D. Rodrik (2018), etc. Further empirical research in this area concerned GVCs in various industrial sectors by T. Sturgeon et al. (2008) and A. Schmitt and J. Van Biesebroeck (2017).

Subsequently, the concept began to be used to analyze sustainable cooperation ties between companies at the micro and meso levels. With the growing interdependence of developed economies, it moved to the global level and the GVC term began to imply a form of the international division of labor with the production of end-use products in different countries.

The phenomenon of GVCs and their classification, in particular, is covered in the works of many authors, for example, J. Humphrey and H. Schmitz (2002), G. Gereffi and J. Lee (2012), and R. Kaplinsky (2013).

At the macroeconomic level, GVCs were created and coordinated by the largest transnational companies (TNCs) through networks of affiliates, contractors, and sales organizations. According to the UNCTAD data for 2013 (United Nations Conference on Trade and Development [UNCTAD], 2013), about 80% of the world trade turnover was associated with the GVCs controlled by TNCs. However, over time, TNCs began to give preference to indirect forms of control, focusing on key intangible assets for modern production: business development, organization and general management of scientific and applied research, marketing, etc., transferring production, trade, marketing operations to independent suppliers and specialized companies.

Thus, the control of GVCs by TNCs is differentiated and allows for exploring various types of management within global chains.

Thus, American scientists G. Gereffi, D. Humphrey, and T. Sturgeon (2005) in their work "The governance of global value chains" distinguish several types of GVCs and ways to manage them:

1. Market GVCs formed based on stable ties between counterparties and allowing their participants to easily find new trading partners;
2. Modular GVCs, within which the supplier company carries out modular deliveries of specific products of the same type on order;

3. Relational GVCs are built over informal relationships between several companies based on ethical and reputational motives. Such chains are also characterized by the territorial proximity of companies, which encourages their participants to form collaborative relations;
4. Captive GVCs built on the relationship of large buyers with small suppliers, where the latter are completely dependent on the buyer;
5. Hierarchy GVCs representing the vertical integration and direct control of lower units by higher ones.

The transformations occurring over time in business organization have led to the evolutionary transition of individual segments of production from vertical integration to horizontal cooperation. As a result, complex and multi-level production relations (value chains) have developed both in the system of holdings and the external environment: GVCs and network structures that began to permeate and connect vertically and horizontally the production processes carried out not only within countries but also at the international level (Dünhaupt & Herr, 2022).

The formation of GVCs started together with the formation of the global technology market. The development of information, communications, and transport technologies allowed deepening the international division of labor and including geographically remote and differently developed countries in GVCs by ensuring coordination within the value chain.

G. Gereffi's "Commodity chains framework for analyzing global industries" (Gereffi, 1991) classified GVCs according to the criterion of initiative and the subject of their creation. According to this criterion, GVCs can be divided into those initiated and controlled by producers and buyers. The first type is characterized by advanced innovative and knowledge-intensive industries, with a high share of expenditures on scientific research and design development. As a rule, such value chains are controlled by industrial corporations and financial-industrial groups. The value chains of the second type are controlled by retail chains and brand owners, usually international ones.

GVC participants acquire several opportunities that allow them, on the one hand, to realize their competitive advantages and, on the other, to achieve the most effective result through involvement in GVCs and gain maximum collective efficiency through the global division of labor. In the context of the growth and development of global industries, TNCs that locate their production in different countries have opportunities to reduce costs through the use of cheaper labor and access to cheaper raw materials in developing economies.

The role of a country in GVCs can take the form of forward and backward participation. Forward participation is associated with the production and shipment of resources which are subsequently re-exported. Backward participation is connected with the use of imported resources for the production of goods that are sent abroad. Different forms of participation determine the dependence of profitability within the value chain on the stage of the production cycle (Kaplinsky, 2013; Shih, 1996).

The development of various network forms of interaction contributes to the emergence and accumulation of network capital. This is understood as a set of long-term specific assets that can create benefits exclusively in these networks and have a low opportunity cost.

The accumulation of network capital is not only a distinctive feature of high-tech industries (nuclear power, rocket and aircraft construction, electronics, pharmaceuticals) but also of medium- and low-tech industries, for example, consumer goods and food industries (Xing, 2022).

The accumulation of network capital affects the closeness of communication and the interdependence of participants. This “locks” participants since the costs of switching to new participants in the interaction are too high. However, that interdependence increases for all actors of interaction: both integrators and dependent participants. Integrators might face various manifestations of opportunism on the part of counterparties, while dependent participants might be forced to invest in specific assets, as well as transfer existing knowledge and technologies.

For parent companies, certain risks might manifest themselves in a decrease in control over production due to the expansion of its geography and, as a result, in a possible decrease in product quality; the need for technology transfer, which might lead to the emergence of competitors in the global market; the growing dependence of companies on political, environmental, and epidemiological risks arising in the global economy. Today, additional risks include the volatility of prices, exchange rates, and interest rates. Under the influence of these factors, there are risks of uncertainty in the functioning of GVCs, which might result in a discrepancy between the actual indicators and the predicted ones. The above-mentioned factors are increasingly influencing the functioning of GVCs, which makes their research and transformation more relevant.

## **MATERIALS AND METHODS**

In the course of the study, we used the following methods:

- The case-study method aimed at studying specific value chains, trajectories of their reformatting, features of added value distribution among their participants, and specifics of network capital formation;
- Factor analysis aimed at studying the factors influencing the receipt and distribution of added value in networks and the formation and accumulation of network capital;
- The comparative analysis aimed at identifying the distribution of added value in different networks, comparing macroeconomic indicators of the functioning of GVCs;
- Structural analysis, including the study of the structural parts and elements of value chains and the mechanism of their functioning.

The data from Russian (the Federal State Statistics Service of the Russian Federation) and international statistics (the WTO, the World Bank), as well as information from open sources, including the official websites of companies participating in value chains, were used as the research material.

Data were processed through the use of such statistical methods as a summary and grouping of statistical surveys, analysis of absolute and relative statistical indicators of networks, statistical sampling, and time series analysis.

## **RESULTS AND DISCUSSION**

### **Influence of Endogenous and Exogenous Factors on the Work of Gvcs: An International Review**

In recent years, the influence of several exogenous factors related to the COVID-19 pandemic and the geopolitical situation has revealed problems associated with the smooth operation of GVCs.

There have been examples of interruptions and breaks in GVCs in the past. For example, the earthquake and tsunami that occurred in Japan in 2011 led to the shutdown of factories producing electronic components for cars. As a result of the disruptions that followed external shocks, negative trends spread throughout the value and supply chains affecting both direct and indirect suppliers, and customers of companies that also suffered losses from natural disasters. In the same year, flooding in Thailand destroyed the factories that produced about 1/4 of the world's hard drives, which led to an extremely difficult situation for manufacturers of personal computers. In 2017, several US industries were left without key materials for the production of plastics and resins due to Hurricane Harvey which destroyed large oil refineries and petrochemical plants.

However, the recent factors have caused negative consequences and have already had a bigger impact, i.e. on the global level.

In 2019-2020, the consequences of dependence on such factors were demonstrated by China, which is one of the central links of the GVC and acts as the main producer of many industrial goods and components for them. In addition, it is the largest consumer of raw materials (Oh, 2021). Since many manufacturing and assembly industries are located in China, the COVID-19 pandemic resulted in an unprecedented drop in production, thereby causing a significant reduction in international trade flows (Zhao & Wong, 2021). The decline in manufacturing activity and exports affected many countries that are not only consumers of Chinese products but also acting as links in GVCs. If compared to the same period in 2019, the largest drop in Chinese exports in the first months of 2020 was in the United States (-27%), Germany (-24%), Italy (-18%), Spain (-15%), and France (-15%).

COVID-19 also affected those countries that did not suffer direct losses from the worsening epidemic situation but faced economic losses due to the disruption of supplies and the rupture of GVCs.

Thus, the diversification of world production aggravated the economic consequences of the COVID-19 pandemic, which in one way or another affected the global economy. In this regard, it is necessary to find solutions that will reduce such risks in the future. One of these solutions might be to strengthen deglobalization processes aimed at the nationalization of GVCs.

In modern conditions, an additional factor influencing the radical reformatting of GVCs is the geopolitical situation, which affects both the global financial and real markets, as well as the structure of global networks and the amount of network capital.

### **Role of Russia in GVCs**

Since Russia is an important supplier of raw materials, it plays a crucial role in numerous global manufacturing operations.

More than a third of Russian exports are products of forward participation, i.e. they are part of the exports of other economies, while downward participation accounts for less than a tenth (Table 1).



Table 1 - The index of participation in GVCs (% in total exports)

Indicators	Russia	Asia	Europe	Northern America	South America
Aggregate participation in GVCs	45.6	44.4	48.8	37.8	36.5
Forward participation	37.1	20.0	21.2	22.0	23.5
Backward participation	8.6	24.4	27.6	15.8	13.0

Source: Prepared by the authors (2023) according to the WTO data (World Trade Organization [WTO], n.d.)

Since the early 21<sup>st</sup> century, the inclusion of the Russian economy in the GVC has been characterized by a high share of companies in the energy complex, the metallurgical industry, and other industries. Industries that have increased their participation in global production systems are primarily automotive, food, textile, and chemical (Bank of Russia, 2021).

The transition to the stage of higher redistribution is complicated by several exogenous and endogenous factors.

The exogenous factors comprise three global shocks faced by the Russian economy.

The first shock happened between 2014 and 2015 and was characterized by foreign political tension in relations with Western countries (primarily the US and the EU). The sanctions imposed against Russia and the adoption of retaliatory measures introduced an import substitution model and decreased the involvement of the Russian economy in GVCs. According to the WTO data for 2015, the country's participation in GVCs was estimated at 41.3% (which is comparable to the data of developed and developing countries – 41.4%). Forward participation was estimated at 30.5% and, as in previous periods, exceeded the results of these countries (developed countries – 20.8%, developing countries – 20%). Backward participation reached 10.8% (developed countries – 20.6%, developing countries – 21.4%). The share of intermediate goods in exports was 71.6% and intermediate services – 30.4%, while the share of intermediate goods in imports amounted to 41.5% and intermediate services – to 28.3% (World Trade Organization [WTO], n.d.).

In 2018, the main export sectors of the Russian Federation in terms of gross exports and national value added remained the mining industry, oil products, and wholesale and retail trade (Table 2).

Table 2 - The national and foreign content of value added in Russian exports in 2018

Industries	% of total gross industrial exports			% of total gross exports	
	Domestic value added	Foreign value added	Total	Domestic value added	Foreign value added
Mining industry (energy products)	96.2	3.8	100.0	27.5	1.1
Petroleum products	94.2	5.8	100.0	15.8	1.0
Wholesale and retail trade	93.4	6.6	100.0	12.6	0.9

Source: Prepared by the authors (2023) according to the WTO data (World Trade Organization [WTO], n.d.)

China, Germany, and the US were the main export destinations for the national value added in 2018 (Table 3).

Table 3 - Main export directions containing domestic and foreign value added in 2018

Industries	% of total gross export to partner			% of total gross exports	
	Domestic value added	Foreign value added	Total	Domestic value added	Foreign value added
China	93.1	6.9	100.0	13.7	1.0
Germany	92.5	7.5	100.0	7.2	0.6
US	90.4	9.6	100.0	4.8	0.5

Source: Prepared by the authors (2023) according to the WTO data (World Trade Organization [WTO], n.d.)

The second challenge for Russia and the global economy was the crisis in international production caused by the COVID-19 pandemic. The fall in global demand and production, as well as the closure of borders and global disruptions in supply chains, have revealed the risks associated with production processes located in various world regions (Deconinck et al., 2020). The response to these risks was the policy of many countries aimed at reorganizing GVCs by shortening and reshoring them to reduce the dependence of national economies on imported goods (primarily essential goods).

Despite global supply disruptions, Russia's exports of intermediate goods and commercial services (excluding fuels) continued to exceed those of imports in 2020 and increased over 2010-2020 (Table 4).

Table 4 - Trade in intermediate goods and commercial services (\$ billion, in %, annual change, in %)

	2020	Total in 2020	Growth over 2010-2020
Intermediate export			
Goods	130	65.8	4.9
Commercial services	17	37.4	1.6
Intermediate import			
Goods	100	43.5	2.1
Commercial services	22	34.8	1.2

Source: Prepared by the authors (2023) according to the WTO data (World Trade Organization [WTO], n.d.)

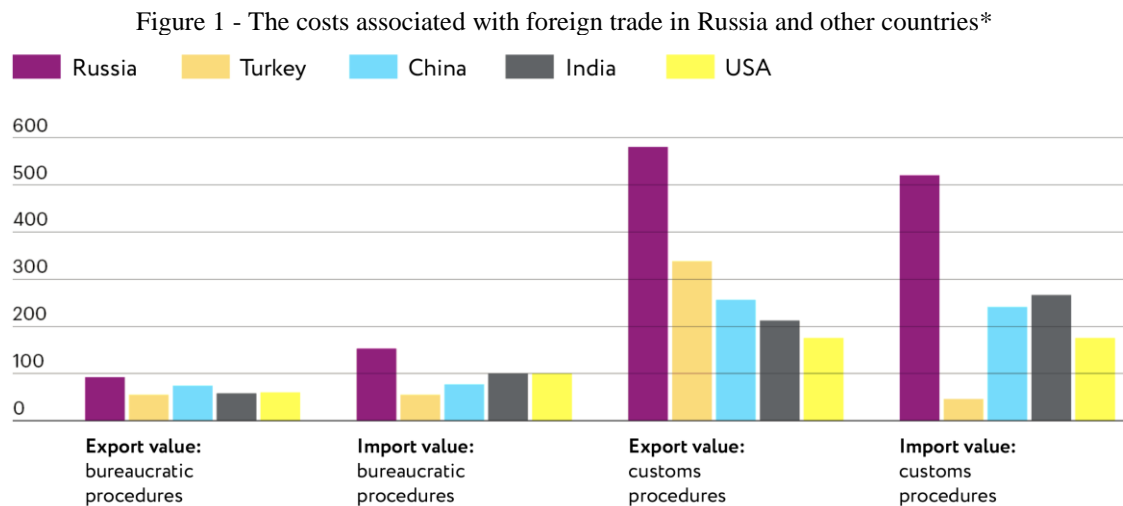
In 2020, the main trading partners of Russia in terms of exports of intermediate goods were the United Kingdom, China, and Turkey and in terms of imports they were China, Germany, and Belarus.

The third challenge is related to the sanctions against the Russian Federation introduced by its trading partners (primarily the EU countries) in 2022. This revealed a rather high dependence of national production on foreign raw materials, components, and semi-finished products and led to the most significant change in the GVC.

For example, the aircraft manufacturing industry has shown disruptions in aircraft production and maintenance networks. Boeing and Airbus, manufacturers of engines and other components informed Russian manufacturers and airlines that they would temporarily suspend the supply of parts and components. The current situation caused failures in the functioning of Russian companies and called into question further cooperation with foreign manufacturers.

The endogenous factors hindering the integration of the Russian economy into GVCs and its transition to the stages of higher redistribution are as follows:

- Institutional factors, in particular, high transaction costs for trading partners: complex customs documentation, delaying bureaucratic and border procedures (Figure 1);



\*The cost of importing a container of a standardized lot of 15 metric tons of auto parts and exporting a standardized lot of best-selling goods (excluding raw materials, waste, and medicines) is worth \$50,000.

Source: Prepared by the authors (2023) according to M. Lyutova (2021)

- Financial factors. Given the lack of foreign direct investment due to exogenous factors which traditionally strengthen the country’s participation in GVCs (for example, Singapore’s experience), it is necessary to identify domestic financial sources of stimulation. In other words, it is required to provide the national economy not only with

short money for current operations and short-term investment projects but also with long investment resources;

– Structural factors. The promising areas that could increase the involvement of Russian companies in GVCs comprise the service of exports discussed by many scholars. In the domestic market, there is an increase in the service sector (telecommunications, transport, etc.), but the export potential of this sector is not fully realized;

– Technological factors. Although import substitution has been one of the most urgent and priority tasks for the country's development in recent years, the current conditions show that focusing exclusively on import substitution is not a remedy for the Russian economy. It is impossible to achieve absolute national self-sufficiency due to limited production factors and possibilities. Under these conditions, it is necessary to focus on those areas that play a key role in maintaining the technological sovereignty of Russia, namely heavy engineering, aircraft construction, machine tool building, electronics, pharmaceuticals, chemicals, and digital technologies. It is also required to identify those breakthrough points that will allow achieving technological leadership and compete not in the old but in the new market fields. In this process, much importance is given to fundamental research and development supported by both the state and big business.

For several years, the well-known Chinese company Huawei has been allocating more than 10% of its income to research and development (15.9% in 2020) to provide a breakthrough in advanced technologies. About 15,000 Huawei employees are involved in fundamental research, including 700 PhDs in mathematics and more than 200 PhDs in physics and chemistry (Dementev, 2022).

The task of the country's technological policy in the long term is to find the right balance between the supplies of foreign countries (to avoid dependence on one participant and rely on diversification) and maintain the high dependence of foreign players on the supply of its national products.

### **Solutions to Support the Economy and Develop Gvcs**

The current situation highlights the strategic need to find new solutions to stabilize the national economy. There is an obvious need to move to higher stages of production than the supply of raw materials and primary processing. This refers to the development and implementation of new technologies in the stages of exploration, production, and processing of

oil and gas, which will increase the value added and the country's participation in global production.

Drastic changes are also taking place in the global networks of mechanical engineering, electronics, chemical, food, light, woodworking, and the agricultural industry.

These sanction-caused shocks made Russian producers quickly replace missing links and open up new niches in various sectors of the economy.

Thus, the reorientation of trade flows and foreign economic contacts is exemplified by the food sector.

In 2022, many foreign food manufacturers announced the suspension of their activities in Russia. The main dependence on imports concerns not so much the food itself but the lack of ingredients and raw materials for the production of products, whose supply depends on the failure of supply chains.

Due to economic pressure on the Russian Federation, domestic suppliers are forced to urgently seek replacements for unavailable intermediate goods both in Russia and abroad to restructure logistics.

Value chains in the Russian food sector are built through changing the composition of participants due to the localization of networks, replacement of retired suppliers, and search for alternative counterparties in other regions. This strategy is currently followed by 4/5 of Russian food producers.

Russia opens up new markets and enters into agreements with new suppliers, refocusing not only on domestic but also on reliable international partners (Ministry of Economic Development of the Russian Federation, 2023): China, India, Latin America, and Africa. Currently, about 80% of food items are produced by Russian companies, except for fruits and vegetables (Latin America), coffee (Vietnam and Brazil), tea (India, Kenya, and Sri Lanka), and sea fish and seafood (India, Bangladesh, and Ecuador).

The Russian food market in the current conditions requires the development of additional measures aimed at supporting domestic producers and reducing their dependence on imported components. In the food sector, these measures are as follows:

- Eliminating the shortage of areas supporting the food sector: seed stock, feed vitamins and additives, and genetic material. The development of national selection and plant nurseries should be a key factor in reducing the cost of agricultural products in the medium term;

- Support for the Russian manufacturers of equipment for the food and processing industry;
- The transition of relevant industrial enterprises to Russian digital products, which will increase productivity, reduce costs and optimize production processes;
- The introduction of modern agricultural technologies (agricultural use of unmanned aerial vehicles, satellite photography of the agro-industrial land fund, monitoring and analysis of crop growth using IoT sensors, etc.);
- The use of the support mechanism and the system of benefits for the enterprises of supporting industries.

The study results demonstrate that today, there are significant transformations aimed at reformatting GVCs through their nationalization and regionalization.

The concept that GVCs should shorten is ambiguous.

On the one hand, the analysis of the ongoing changes indicates that the loss of certain participants does not always lead to network functioning failures.

Some networks have long used the principle of diversification, attracting competing suppliers for the same tasks. In the other networks, participants might have more market power and not depend on external conditions.

Several economic studies trace the concept of GVC flexibility that largely depends on the conditions of supply and logistics, where different levels of integration and development strategies offer different levels of flexibility with due regard to the volume and range of products (Soon & Udin, 2011).

Recent studies also highlight that the current development of GVCs is determined by competition, technological revolution, and reshoring (Konina, 2023).

Considering the exogenous factors that put pressure on the economic development of most countries, there are several directions for reformatting GVCs:

1. Change in the composition of participants, i.e. the replacement of retired participants and search for alternative counterparties;
2. The localization of networks, including reshoring, and search for Russian suppliers;
3. The restructuring of networks, i.e. a change in the structure of networks and forms of relationships with participants.

On the other hand, some studies highlight the contradictory nature of GVCs and their impact on global trade associated with uneven economic development (Bair, 2005; Brewer,

2011; Dunn, 2017; Geraghty, 2021). This fact makes scientists, economists, and politicians search for new ways to make GVCs sustainable (Schmidt et al., 2019).

Some authors (Jentsch & Fischer, 2019) point out that the nationalization and regionalization of value chains cannot ensure the full resilience of the economy to shocks associated with the disruption of supplies and production, which is due to several reasons:

- Firstly, a decrease in dependence on foreign resources increases dependence on domestic resources, whose supply can also be disrupted due to several shocks (for example, climatic, epidemiological, etc.). In addition, no country can ensure full self-sufficiency in resources without any negative consequences. Therefore, the decrease in the country's involvement in world production and trade has certain limits, beyond which the negative consequences might begin to increase and influence the economy as a whole;
- Secondly, suppliers that are geographically close to production will not guarantee a reduction in risks in the event of a supply failure, unless shocks concern long transport routes that complicate the interaction of economic agents. We cannot univocally assert that the reduction in the GVC length will lead to an increase in the security and stability of the economy;
- Thirdly, the accelerated reformatting of GVCs towards the national economy creates additional risks for the financial stability of companies, which is associated with high capital costs for the relocation of production and the possible diversion of resources from other sectors of the economy. The consequences of such transformations will inevitably lead to a slowdown in economic growth in the medium term.

International experience shows that several GVCs operate only at the regional level. Thus, European and Asian regional networks (the US, Germany, and China) are developing and functioning separately, there are regional centers that play a dominant role in trade.

For many countries, such a policy is a necessary measure. For example, the ASEAN member states are subject to deglobalization due to the redistribution of industries previously concentrated in China. This makes them conclude regional free trade agreements both with each other and with their partners outside of Southeast Asia.

Changes in modern value chains can help minimize negative consequences for the Russian economy through practices aimed at diversifying suppliers, markets, and production processes.

## CONCLUSION

The results of this study reveal the current state of global value chains (GVCs) and their transformation, which includes dying off, radical restructuring, and emerging chains. Some chains experience a decrease in network capital, while others rapidly accumulate. At the macroeconomic level, the impact of current trends and factors is increasing the vulnerability of the global economy and slowing down medium- and long-term economic growth rates. To reduce possible risks, several measures should be taken, including the implementation of industrial and trade policies, participation revision in GVCs, reformatting on a regional level, and searching for new opportunities for the development of various trade unions.

The study of Russia's participation in GVCs highlights that over a third of Russian exports account for products of forward participation, which are part of the exports of other economies, while backward participation is less than a tenth. The Russian economy faces exogenous and endogenous factors that complicate its transition to a stage of higher redistribution. The sanctions policy of several of Russia's trading partners is the priority among the exogenous factors, leading to a radical change in the configuration of existing GVCs. Endogenous factors include technological factors associated with a shortage of national technologies and production elements, whose prompt replenishment is necessary to maintain the technological sovereignty of Russia. It is essential to identify breakthrough points and directions that will allow the country to achieve technological leadership and compete in new market fields.

Despite certain failures in the current changes, Russian manufacturers in many industries demonstrate high sustainability, including the localization of networks, the replacement of retired suppliers, and the search for backup options for counterparties in other regions. The study concludes that the transformation of GVCs poses both benefits and risks for participating countries. Practical solutions can improve the sustainability of GVCs, which can have practical significance for policymakers, businesses, and industries involved in GVCs.

Despite the comprehensive coverage of GVCs and their impact on the Russian economy, there are limitations to this research. One limitation is that the analysis is based on data up to September 2021, which may not reflect the current state of GVCs and their impact on the Russian economy. Additionally, the research is focused primarily on the food sector and may not be representative of the broader impact of GVCs on the Russian economy.

To address these limitations, future work could involve an updated analysis of GVCs and their impact on the Russian economy, taking into account the current state of the global



economy. Additionally, future research could focus on other sectors of the Russian economy to gain a more comprehensive understanding of the impact of GVCs.

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