BLOCKCHAIN INTEGRATION FOR ENHANCING SUSTAINABLE DEVELOPMENT AND RESILIENCE OF INTERNATIONAL SUPPLY CHAINS AMID ECONOMIC SANCTIONS

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ABSTRACT

Objective: This study aims to develop and test methodological approaches for analyzing the prospects of macroeconomic growth in the Russian Federation through the integration of blockchain technologies in export-import operations. The research focuses on how blockchain can enhance international payment systems and stimulate international trade under economic sanctions.

Method: The study employs a descriptive express analysis and a system of recursive equations to explore the dynamics between cross-border cash flows and GDP growth. Data from the World Bank and the Central Bank of Russia are used to model the impact of transnational cash flow variations on the GDP of the Russian Federation. The methodological framework includes constructing and solving a system of econometric equations to predict economic outcomes based on changes in cash flow dynamics.

Results: The findings reveal that a 1% reduction in transnational cash flows could potentially decrease the GDP of the Russian Federation by 0.45%. The introduction of blockchain technologies in cross-border payment systems is shown to mitigate these risks by providing a secure and efficient alternative to traditional international payment methods. This integration not only enhances the resilience of supply chains but also supports sustainable economic development amid sanctions.

Conclusions: The study concludes that blockchain technology offers significant potential to sustain international supply chains and economic stability under sanctions. By ensuring secure and efficient cross-border transactions, blockchain can help localize risks associated with disruptions in international payment systems, thereby fostering sustainable economic growth. The research underscores the importance of adopting innovative technologies to navigate economic challenges and enhance the resilience of national economies.

Keywords: Blockchain, International Supply Chains, Economic Sanctions, Sustainable Development, Cross-border Payments

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INTRODUCTION

The formed conditions for the development of the national economy of the Russian Federation, characterized in many respects by the observed processes of transformation of the existing value chains as a result of the disturbance of export and import flows within the framework of the sanctions, predetermine the search for new mechanisms and directions for intensifying economic growth and leveling threats in the field of restrictions on export and import operations. In this regard, in solidarity with the position of several Russian scientists and experts (Masalsky, 2022; Dubrovskaya, 2022; Safiullin & Elshin, 2023), the issues of leveling threats created by sanctions become extremely relevant on the agenda. It is important to emphasize that a special role in the list of designated areas of strategic development is played by the search for mechanisms to ensure the sustainability of supply chains, within the framework of an external contour concerning the Russian economy. Undoubtedly, this problem is multidimensional and includes a wide range of tasks and ways to solve them: starting from import substitution development mechanisms and ending with the creation of alternative international payment systems that are not controlled by the countries of the Western bloc and do not pose a threat of pressure on third countries involved in the implementation of cross-border payments with the Russian Federation.

The issues of creating alternative payment systems at the supranational level are of particular relevance in the context of sanctions imposed by individual countries concerning national economic systems. Thus, the increased international sanctions pressure on the national economy of the Russian Federation in 2022 led to the restriction of access of the Russian financial system to international payment systems. For example, the largest banks of the Russian Federation (Sberbank, VTB, Otkritie Bank, VEB.RF, Credit Bank of Moscow, Rosselkhoznadzor, etc.) and corporations were disconnected from SWIFT on June 3, 2022, which significantly led to the complication of the processes of implementing international financial transactions from and to Russia. The problem is even more urgent because according to data for 2021, about 300 Russian financial organizations used the SWIFT system. According to this indicator, Russia ranked second in the world after the United States. In this regard, it is not difficult to imagine the scale of the consequences for the Russian economy as a result of disconnecting from this service for data processing and transmitting financial messages. Disconnecting financial institutions from SWIFT implies that the potential for their implementation of payment transactions and transactions with foreign currency is significantly limited, which accordingly affects the movement of foreign trade turnover and disruptions to the stability of supply chains.

In this regard, the issue of alternative mechanisms for organizing international supply chains and accompanying cross-border transactions is quite urgent on the agenda of the current day for the Russian economy.

LITERATURE REVIEW

Taking into account the increased level of demand for research in the field of finding the most sustainable models of economic growth by the principles of national sovereignty, works aimed at finding and substantiating mechanisms for implementing import substitution policies at both the macro- and meso-levels have begun to appear more often. Some of them are presented below. Before presenting an overview of the

existing approaches to the problem posed in this project, it should be noted that there is a very limited range of works that would use not only the theoretical justification of the issue as the subject of research but also methods of formalized analysis, scenario modeling and forecasting of possible effects in their instrumentarium.

Talking about the most relevant works in this field, it is necessary to highlight the research of Russian scientists presented below.

A.G. Zeldner in his study "Import Substitution: desires, opportunities and Reality" (Osipov et al., 2017) focuses (within the framework of studying the prospects of import substitution policy in the national economy of Russia) on the assessment of the consequences expressed in the sanctions confrontation of the Russian Federation with Western countries.

V.V. Popov in his work "The impact of foreign and mutual trade on the economic potential of the Russian Federation" (Osipov et al., 2017), using the functionality of the STATISTICA software package, obtained econometric models, the results of evaluating the parameters of which allowed us to obtain estimates of the impact of mutual trade of the Republic of Kazakhstan and the Republic of Belarus on the economic potential of the Russian Federation.

According to the results of the study, he has proved that relations with the Eurasian Economic Union (EAEU) countries have a greater influence on the foreign trade of the Russian Federation, which is largely an indicator of the development of its economic potential.

A.P. Tsypin in his study "Methodology of statistical assessment of the highest-risk territorial units of the Russian Federation in terms of the development of economic potential depending on changes in the structure of commodity flows" (Osipov et al., 2017) proposed a conceptual scheme for identifying (monitoring) high-risk territorial units that are highly likely to face (if they have not already faced) the problem of reducing economic potential, therefore, the loss of investment attractiveness and, as a consequence, the loss of prospects for further development, depending on changes in the structure of commodity flows.

N.A. Nevskaya in "Formation of a system of economic policy measures" (Osipov et al., 2017) substantiates the position according to which the formation of a system of economic policy measures aimed at maximizing import substitution is an objective necessity.

It is also important to note that the issues of theoretical and applied understanding and research of import substitution policy and the formation of stable cooperative ties, little exposed to the global conjuncture, have received considerable attention in recent years and among foreign researchers. The most notable of them are (Deringer et al., 2018; Bas & Strauss-Kahn, 2014; Stone et al., 2015; Zhang & Huang, 2021).

At the same time, it should be emphasized that one of the main ideas of leveling the risks of possible disruption of international supply chains, and, consequently, ensuring the sustainable development of national economic systems, considered and carefully studied by modern researchers and various international organizations, today is the transition to decentralized platforms and trading platforms (Stone et al., 2015; Safiullin et al., 2014; Elshin, 2017). Its essence is to replace the established formats for the development of e-commerce trading platforms with a variety of intermediaries (financial, insurance, logistics, etc.) with a decentralized format that directly connects

buyers and sellers (concerning the object of this study, exporters, and importers) following the principles of creating and developing a peer-to-peer (P2P), decentralized network based on a blockchain that ensures national sovereignty. In this regard, recently, both among Russian and foreign scientists, aspirations to study this issue have become increasingly evident (Zhang & Huang, 2021; Kochergin, 2021).

In many ways, the interest in this issue is also caused by the need to localize the risks of sustainable development in the context of sanctions on national economic systems from international clearing systems, which may entail risks of sustainable formation of international supply chains. This factor is especially relevant to the current state of international economic relations. For example, the issue of alternative mechanisms for organizing international supply chains and cross-border transactions accompanying them is quite urgent on the agenda of the current day for the Russian economy (Masalsky, 2022; Dubrovskaya, 2022). Western countries impose restrictions on the Russian financial system's access to international clearing systems, which either restrict the potential for foreign economic activities or considerably complicate international trade processes, particularly with regard to increased transaction costs. This, in turn, determines the possible prospects for correcting the economic dynamics and sustainability of development. In this regard, it is extremely important to analyze the modern global architecture of the payment system, as well as current and promising trends in the field of financial technologies, providing the possibility of creating new formats for the implementation of cross-border payments, especially taking into account the processes of the technological revolution that are actively gaining momentum.

METHODS

Before proceeding to the processes of constructing models aimed at finding solutions to the tasks set here, it is very important to consider the main trends that reveal the features of the formation of foreign economic cash flows regarding the economy of the Russian Federation and identify key trends on this basis (Figure 1).
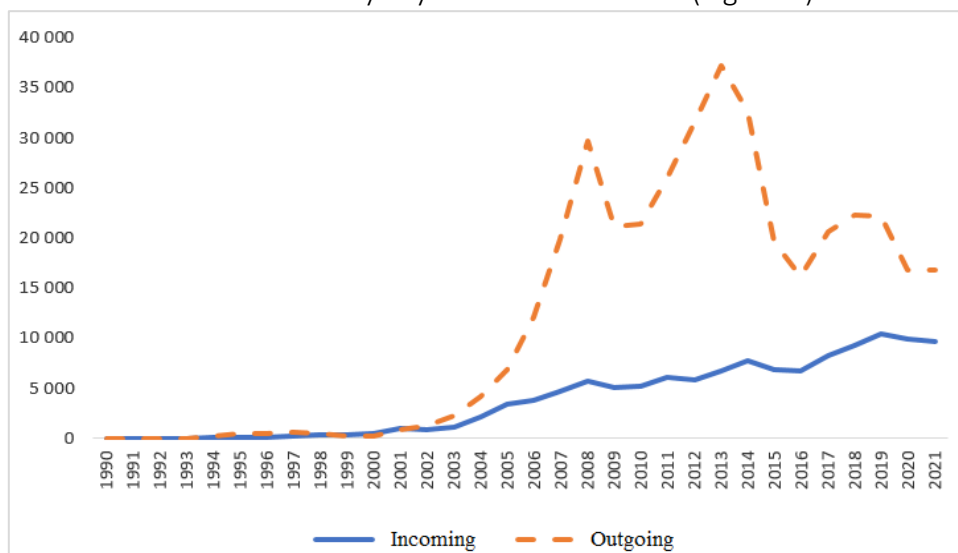

Figure 1. Dynamics of incoming and outgoing cash flows, million USD
Data source: World Bank (World Bank, 2023)

It is important to note that a very noticeable share of the total volume of cross-border cash flows is accounted for by individuals. The relative share of those is about

40%. At the same time, in the total volume of monetary transactions, the Western bloc countries account for the bulk of transnational money transfers (about 85%) (Figure 2).
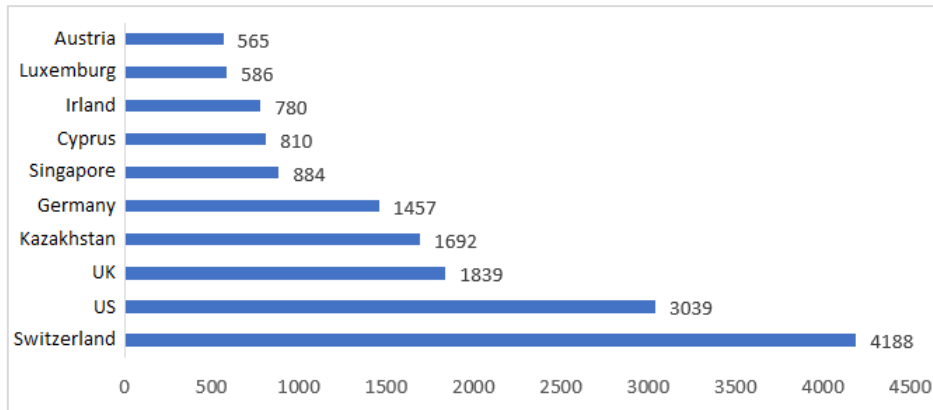

Figure 2. Cross-border transfers in favor of individuals across the ten main countries participating in those transactions in 2021, USD million, in Russia
Source: Central Bank statistics (Bank of Russia, 2023).

In summary, the outcomes of the descriptive express analysis reveal substantial volumes of cross-border cash flows in the Russian economy. This underscores the extensive integration of the Russian economy into the global economic landscape while highlighting the significant dependence of the Russian national economic system on potential disruptions in accessing international clearing services and the development of cross-border supply chains.

Any disturbances in established external relations can lead to very negative consequences, which is especially important in conditions of significant dependence of the economy of the Russian Federation on imports, the share of which in the national economy of Russia is about 21% of the gross domestic product (GDP) (Table 1). In this regard, the ongoing changes in the volume of foreign economic cash flows (caused, among other things, by sanctions, the violation of which entails negative consequences for third countries), can significantly disrupt the way and dynamics of the formation of economic growth. To mitigate such risks, it seems appropriate to assess the possible consequences and propose mechanisms to ensure the localization of the threats in question to maintain stable supply channels for imported components, raw materials, and finished products.

Table 1. The Share of Imports in the Russian Economy, in % of GDP 2010-2022
(Calculated by the Authors According to the Available Data)

2010	2015	2021
21.1	20.6	21.3

Data source: Unified Interdepartmental Information and Statistical System (EMISS) (Unified Interdepartmental Information and Statistical System [EMISS], 2023).

It is advisable to implement the solution of the task within the framework of the search for answers to two key questions. The first of them is aimed at finding patterns that show the desired relationship between the GDP of the Russian Federation and the dynamics of changes in transnational cash flows. The second task is to develop possible ways to neutralize threats to sustainable development and disruptions to international
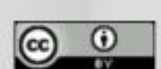
supply chains. Adhering to this methodological concept of the study, the methodological approaches to the implementation of the goals are presented below.

Methodological Tools and Assessment of the Impact of Changes in Transnational Cash Flow on the GDP Growth of the Russian Federation

A system of recursive equations is proposed to study the dependence of GDP on the incoming cash flows of the transnational level.

In structural form, the model looks like this:

$$\begin{cases} y_1 = a_{01} + a_{11}x_1 + b_{12}y_2 + \varepsilon_1 \\ y_2 = a_{02} + a_{22}x_2 + a_{23}x_3 + \varepsilon_2 \\ y_3 = a_{03} + b_{31}y_1 + a_{32}x_3 + \varepsilon_3 \end{cases}$$

y_1 - Incoming cash flow

y_2 - Consumer price index

y_3 GDP

x_1 Digital technology costs

x_2 Net exports

x_3 Dollar exchange rate

a_{01}, a_{02}, a_{03} Free members

Thus, in the model, the following indicators act as endogenous (dependent) ones: incoming cash flow, consumer price index, and GDP.

The predefined (independent) ones are digital technology costs, consumer price index, net exports, and dollar exchange rate.

As a rule, the use of the LSM (Least Squares Method) for estimating the parameters of a structural model gives untenable and biased estimates, so the system of equations must be transformed into the reduced form. In the framework of this study, the given form will look the following way:

$$\begin{cases} y_1 = A_{11}x_1 + A_{12}y_2 + A_{13}x_2 + A_{14}x_3 + A_{15}y_1 \\ y_2 = A_{21}x_1 + A_{22}y_2 + A_{23}x_2 + A_{24}x_3 + A_{25}y_1 \\ y_3 = A_{31}x_1 + A_{32}y_2 + A_{33}x_2 + A_{34}x_3 + A_{35}y_1 \end{cases}$$

When moving from the reduced form of the model to the structural one, it is important to check the identification condition, i. e. the uniqueness of the correspondence between the reduced and structural forms of the model.

The following situations are possible.

1) The structural coefficients are unambiguously expressed in terms of the coefficients of the reduced form of the model. In this case, the structural model is called precisely identifiable.

2) Some of the structural coefficients are not expressed in terms of the coefficients of the reduced form of the model. Such a structural model is called unidentifiable.

3) Structural coefficients are ambiguously expressed in terms of coefficients of the reduced form of the model. Then the structural model is called superidentifiable.

A necessary condition for identification. Let K be the number of exogenous variables not included in the equation, but present in the system, and M be the number of endogenous variables included in the equation. If the condition K ≥ M-1 is met, then the equation in the structural model can be identified.

Adhering to these methodological principles, the construction of a system of equations was implemented and an assessment of the verification of the necessary conditions for the identification of the constructed model was carried out.
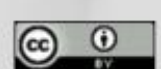
RESULTS AND DISCUSSION

Within the framework of using the proposed methodological tools, the following system of equations was obtained, showing the features and patterns between the studied factors:

$$\begin{cases} y_1 = 24497{,}3 + 0{,}0013x_1 - 176{,}76y_2 \\ y_2 = 112{,}24 - 0{,}0009x_2 + 0{,}034x_3 \\ y_3 = 5031662 + 5826{,}77y_1 + 2{,}68x_3 \end{cases}$$

The model includes K=3 endogenous variables y_1, y_2, y_3) and M=5 predefined (exogenous) variables $(x_1, y_2, x_2, x_3, y_1)$.

K-1 = 2; K + M = 8

Equation No. 1.

$$y_1 = 24497{,}3 + 0{,}0013x_1 - 176{,}76y_2$$

This equation includes 1 endogenous variable (Y1), i.e. k1 = 1, and 2 predefined variables (x1, y2), i.e. m1 = 2.

M-m1 = 3 > k1 - 1 = 0, i. e. the equation is superidentifiable (if sufficient identification conditions are met).

Equation No. 2.

$$y_2 = 112{,}24 - 0{,}0009x_2 + 0{,}034x_3$$

This equation includes 1 endogenous variable (Y2), i.e. k2 = 1, and 2 predefined variables (x2, x3), i.e. m2 = 2.

M-m2 = 3 > k2 - 1 = 0, i. e. the equation is superidentifiable (if sufficient identification conditions are met).

Equation No. 3.

$$y_3 = 5031662 + 5826{,}77y_1 + 2{,}68x_3$$

This equation includes 1 endogenous variable (y_3), i.e. k3 = 1, and 2 predefined variables (x3, y1), i.e. m3 = 2. M-m3 = 3 > k3 - 1 = 0, i. e. the equation is superidentifiable (if sufficient identification conditions are met).

Based on the results of the analysis, Table 2 presents the systematization of the estimates obtained.

Table 2. Matrix of Coefficients for Model Variables (Compiled by authors)

	y_1	y_2	y_3	x_1	y_2	x_2	x_3	y_1
Equation No. 1	-1	0	0	0.0013	-176.76	0	0	0
Equation No. 2	0	-1	0	0	0	-0.0009	0.034	0
Equation No. 3	0	0	-1	0	0	0	2.68	5826.77

Data source: calculated by the authors

Further, according to the basic principles of econometric analysis, an analysis is implemented for sufficient conditions for identifying the resulting model (system of equations). It is advisable to solve this problem based on the analysis of sufficient identification conditions for each equation of the system. For them to be fulfilled, the determinant of the matrix A (matrix of coefficients for variables not included in this equation) must be equal to K-1 = 2. The results of this analysis are presented in Tables 3-5.

Table 3. Matrix of Coefficients for Variables not Included in Equation 1

-1	0	-0.0009	0.034	0
0	-1	0	2.68	5826.77

Data source: calculated by the authors

Its rank is 2, hence detA ≠ 0.
The sufficient identification condition for equation No. 1 is satisfied (K-1 = 2).

Table 4. Matrix of Coefficients for Variables not Included in Equation 2

-1	0	0.0013	-176.76	0
0	-1	0	0	5826.77

Data source: calculated by the authors

Its rank is 2, hence detA ≠ 0.
The sufficient identification condition for equation No. 2 is satisfied (K-1= 2).

Table 5. Matrix of Coefficients for Variables not Included in Equation 3

-1	0	0.0013	-176.76	0
0	-1	0	0	-0.0009

Data source: calculated by the authors

Its rank is 2, hence detA ≠ 0.
The sufficient identification condition for equation No. 3 is satisfied (K-1= 2).
Thus, each of the equations of the system is superidentifiable, hence the system is superidentifiable.
A two-step LSM was used to solve the system since the use of ILSM (indirect LSM) will not give unambiguous estimates for a superidentifiable system.
According to the results of calculations, the following system of equations is obtained:

$$\begin{cases} y_1 = 0{,}04x_1 - 145{,}79y_2 \\ y_2 = -0{,}0125x_2 + 0{,}084x_3 \\ y_3 = 6025{,}8y_1 + 3{,}15x_3 \end{cases}$$

Following the principles and approaches of the proposed methodological tools, as well as relying on the methods of simulation modeling of the processes under study, Table 6 presents prognostic estimates of the growth of the GDP of the Russian Federation within the framework of the intensification of business activity and the corresponding change in transnational cash flows.

Table 6. Simulation of GDP Growth Due to the Intensification of Business a Activity and the Corresponding Change in Transnational Cash Flows (According to Data for 2021)

No.	Growth rates of the aggregated value of cross-border cash flows	GDP growth, in %
1	Current value	-
2	+1.0%	+0.45
3	+3.0%	+1.34
4	+5.0%	+2.24

Data source: calculated by the authors

The estimates obtained, characterizing the growth potential of the GDP of the Russian Federation due to the disturbance in foreign economic cash flows and, accordingly, trade turnover, indicate a very high level of dependence of the Russian national economy on changes in their volumes. Following the data presented in Table 6, a 1% change in the volume of transnational cash flows creates a potential correction of GDP by 0.45% and vice versa. In this regard, any adjustments in international supply chains in the Russian Federation will have a very sensitive impact on the prospects for sustainable development of the national economic system.

Development of Possible Measures that Neutralize the Threat of Disruption of Sustainable Trends in the Organization of International Supply Chains

Given the existence of sanctions imposed on the Russian economy, it should be stated that it is necessary to find mechanisms to neutralize the threats of slowing down foreign trade turnover, primarily within the framework of sanctions limiting international transactions. Undoubtedly, this task is not easy.

At the moment, experts and scientists name different mechanisms for solving it: starting with the reorientation of supply chains from West to East and ending with the directions of intensification of scientific and technological development to activate import substitution processes. Meanwhile, aspects that have a significant potential for solving the problem under consideration, such as the creation of alternative channels and gateways that provide cross-border payments bypassing sanctions pressure, fall out of the research focus. These, of course, should include blockchain platforms that implement the functionality of ensuring international payments.

The blockchain technology market and business operations based on them, including financial transactions, are developing extremely dynamically in the world (Sidorenko, 2021; Engert & Fung, 2017; Náñez Alonso et al., 2021). Economic relations built using digital money are becoming more and more integrated into the system of economic relations every year (Kochergin, 2021; Sakharov, 2021; Safiullin et al., 2019). This is largely because blockchain is a very effective tool for eliminating the shortcomings that have developed in international practice in the field of interbank payments and related processes for world trade. With a certain degree of confidence, it can be argued that blockchain is an alternative mechanism to traditional banking methods for ensuring cross-border and national transactions. The technology forms the basis for a cheap and secure alternative to the formation of international payment systems, optimizing the cross-border process of ensuring supply chains (Ganne & Patel, 2019; Tapscott & Tapscott, 2017), while maintaining the highest level of security of international financial transfers as part of the implementation of a secure distributed registry that restricts unauthorized access to financial transactions (Zhang & Huang, 2021; Safiullin et al., 2019; Allen et al., 2019).

The escalating international situation, which results in increasing sanctions pressure and restrictions on access for international clearing companies, payment systems, disconnection of financial organizations of the Russian Federation from the SWIFT system, etc., attracts significant attention to the issue of prospects and generated effects in the process of transformation of the national payment system as part of the transition to blockchain. In these conditions of a new reality, the task of the intensification and search for alternative channels for organizing international and national transactions makes strategic sense.

The possibility and potential of replacing foreign technological solutions with Russian developments determines not only the global competitiveness of Russia but also forms the foundation for ensuring the sustainability of its national financial system, and the intensification of socio-economic development processes, taking into account existing limitations.

The question of the advisability of building new channels for ensuring cross-border payments also becomes more relevant because economic relations built using blockchain and digital currencies (DC) are becoming more and more deeply integrated into the system of economic relations in the world every year. A survey by the Bank for International Settlements (Boar et al., 2020) indicates that most central banks are implementing their research and are at various stages of assessing the prospects for the introduction of DC into circulation (Boar & Wehrli, 2021). In particular, 86% of central banks are studying the possibilities of issuing DC into circulation, 60% are experimenting with technologies, and 14% are in the stage of applied development or pilot projects (Boar & Wehrli, 2021). The European Central Bank, the Bank of Sweden, the Bank of Canada, the Bank of Russia, the Bank of England, the Reserve Bank of Australia, and the People's Bank of China take an active position on this issue. The mentioned regulators consider DC as "a new form of fiat money issued digitally by the central bank and constituting a legal tender" (Allessie et al., 2019).

According to the estimates of the Bank for International Settlements (Boar & Wehrli, 2021), by 2026, more than 20% of Central Regulators in the world will put DC into circulation. According to the presented data2, at the beginning of 2023, 87 countries are actively working on and discussing the launch of DC into economic circulation (Figure 3). At the same time, the number of countries already using DC in the system of economic relations is still an order of magnitude smaller than the countries that are at the stage of discussion and pilot launch of DC into economic circulation (Figure 4).
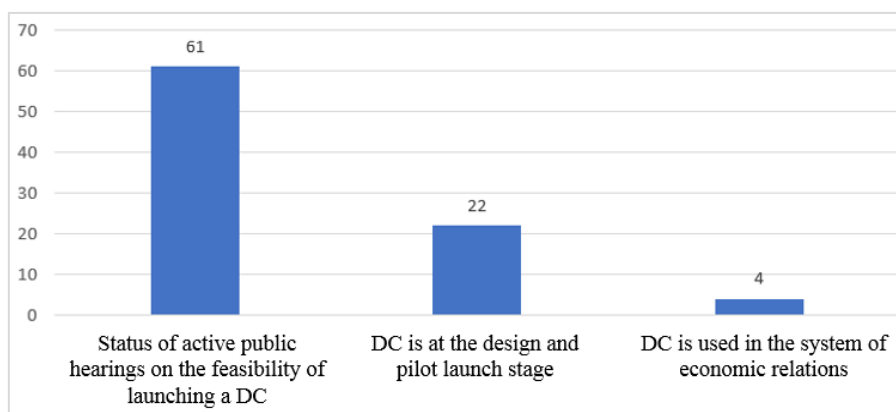
*0: the central bank's DC launch project has not been announced;
1: status of active public hearings on the feasibility of launching a DC;
2: DC is at the design and pilot launch stage;
3: DC is used in the system of economic relations.
Figure. 3. Current status of the DC launch
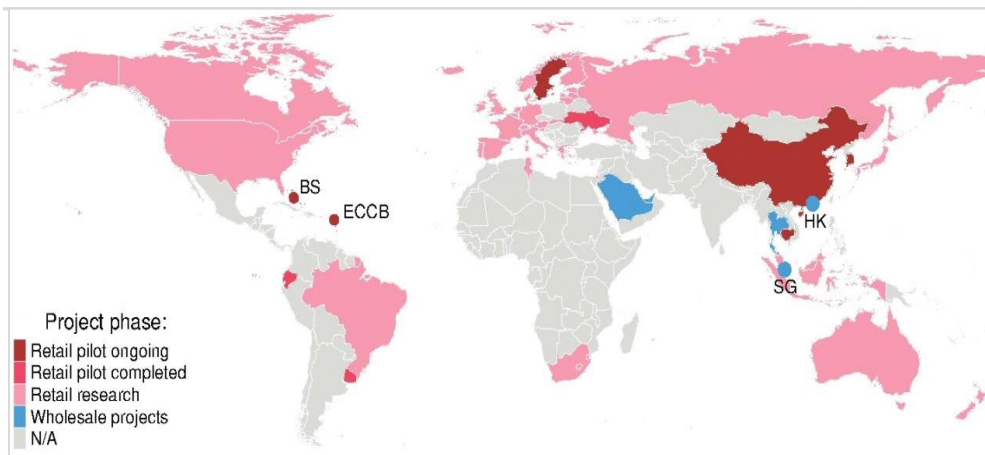Source: compiled according to Boar (Boar & Wehrli, 2021)

Figure. 4. Cartographic illustration of the status of the DC in the world
Source: compiled according to Boar (Boar & Wehrli, 2021)

Actualizing the importance and role of blockchain and payment systems based on them, including at the cross-border level, it should be noted that despite the contradictory approaches and positions of experts to the feasibility and possibility of their use in economic activities, individual states and economic entities are already actively following and developing along the path of "blockchainization" of the process of organizing international chains deliveries (Table 7).

Table 7. The Practice of Using Blockchain Ecosystems in the Supply Chain Organization System in International Trade

Partner organizations	Functionality and purpose of the system	Project launch date
Banks of Canada, Singapore JP Morgan (American bank, multinational financial holding)	Implementation of financial cross-border transactions using DC to accelerate transaction procedures, reduce their cost, and increase the level of security within the framework of the use of blockchain	2019
KlickEx together with Stellar.org and the IBM blockchain	Using blockchain platforms for money transfers	
KlickEx is a monetary payment system of the Central Bank of Polynesia using the Smart market interbank retail system		2017
Circle is a P2P payments technology company that currently manages the popular USDC (USD coin) stablecoin, a cryptocurrency whose value is tied to the US dollar	Instant cross-border transactions in the format of P2P payments without commission based on the Ethereum blockchain	2017
ReiseBank (Germany) and ABT (Canada)	Banks use the Ripple blockchain to organize and conduct international payments	
	The blockchain platform allows financial organizations to process cross-border transactions instantly and without fees	2016

Source: Developed from data (Copigneaux et al., 2020; Glaser et al., 2019).

The intensification of the distribution and integration of blockchain into the economic environment, including international trade, is largely conditioned by the fact that these technologies significantly facilitate the process of building economic relations between the parties involved in an international transaction.

The previously mentioned sanctions, which restrict the potential for foreign economic transactions, greatly enhance the importance of utilizing blockchain technology within the framework of cross-border payments. This includes ensuring the stability of international supply chain processes.

It is important to note that the Russian economy has very effectively leveled the threats from Western sanctions in the sphere of pressure on the national payment system. The creation of Russian Systems for Transfer of Financial Messages (SPFS), which make it possible to form mechanisms for processing financial transactions within the country that are autonomous from international payment systems, the creation of sovereign mechanisms for interbank interaction, and the sustainable functioning of national card products have acted as key tools for adapting payment transactions in the Russian economy.

Unfortunately, it should be noted that the payment system providing cross-border payments has not adapted so successfully to Western sanctions. An attempt to transfer this kind of financial transaction into the SPSF system bypassing SWIFT could not completely solve the problem.

In this regard, the issue of alternative mechanisms for organizing international supply chains and accompanying international transactions is quite urgent on the agenda of the current day for the Russian economy (Dubrovskaya, 2022). This conclusion is of particular importance based on the estimates implemented above, demonstrating the impact of the disturbance in foreign trade relations of the Russian Federation on the prospects for GDP growth.

CONCLUSIONS

In conclusion, it should be noted once again that the level of influence of changes in the volume of foreign economic cash flows on macroeconomic dynamics is believed to be very significant for the Russian Federation. According to the results of the study, it was found that an increase of 1% in the volume of transnational cash flow determined the growth of GDP by 0.45%. Accordingly, the negative dynamics of the indicator under consideration will form a corresponding slowdown in the dynamics of economic growth.

In the case of the integration of the Russian Federation into the global chains of transactional operations using blockchain in a larger format, the mechanisms for leveling sanctions threats will be actively developed and will largely contribute to ensuring the independence of the national economy of the Russian Federation from any restrictions from global regulators.

In general, it is also important to emphasize that the proposed solutions for leveling the risks of disruption of international supply chains due to sanctions, based on the integration of blockchain technologies into the system of transnational transactions, will greatly contribute to the development of conceptual approaches of traditional schools of economic theory focusing on the study of economic growth factors. The increasing processes of transformation of productive factors in the conditions of the sixth technological order dictate the need to explore new points of development, including in the field of organizing new-level economic relations, based, in particular, on the use of blockchain and the construction of new models of international trade.

ACKNOWLEDGMENTS

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