И.В. Пилипенко

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The NPO "Institute for Competitiveness and Integration (RICI)"

Igor V. Pilipenko

The Method of Implementing the Clearing Payment System in Foreign Trade of the Russian Federation under Sanctions

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Reviewers:
K.L. Astapov, Doctor of Economic Sciences,
Professor, Department of Economic and Financial Strategy,
Moscow School of Economics, Lomonosov Moscow State University;
E.L. Loginov, Doctor of Economic Sciences,
Professor of the Russian Academy of Sciences,
Deputy General Director, Institute for Economic Strategies

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Freely convertible currencies offer some unrivalled benefits in the process of international settlements. However, since the Western states have toughened sanctions against Russia throughout 2022, a question of how to conduct foreign trade under new conditions has been put on the agenda in the Russian Federation.

This book presents the method of implementing the clearing payment system as one of systemic solutions for the Russian Federation's foreign trade facilitation under the restricted access of Russian economic entities to freely convertible currencies and partial convertibility of the ruble. We consider the history of clearing trade and payment implementation in the world during the 20th century and lessons learnt from the Soviet experience within socialist integration. Main goals, conditions for implementation and settlement mechanisms under bilateral and multilateral clearing arrangements between Russia and partner states are further articulated. Having analysed a broad spectrum of fundamental and applied economic studies carried out by foreign and Russian scholars from the mid-19th century to the beginning of the 21th century, we set out our technique of defining a new unit of account (a clearing currency), which we called the "uniclear", on the basis of the equation of exchange within the quantity theory of money. The monograph presents our calculations of the uniclear and exchange rates of national currencies against this unit of account for the period of 2010–2021 for six groups of countries (152 economies in total), including the member states of the Eurasian Economic Union, the Commonwealth of Independent States, BRICS and the Shanghai Cooperation Organisation.

This book is for specialists in the international monetary system and the financial sector, monetary circulation and foreign trade, employees of the Bank of Russia, federal governmental officials and the banking sector's employees that deal with international payments; for scholars, academics and students specialising in finance and economics.

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Summary

The toughening of the sanctions imposed by the Western states against the Russian Federation during February – July 2022 has seriously hindered the external trade of Russian companies and their relations with foreign counterparties. From all the packages of restrictions aimed at the financial, energy, transport and military-industrial sectors of the Russian economy the most hurting are those blocking the access of Russian juridical persons to freely convertible currencies (the US dollar, the euro, the pound sterling), to the services of the Society for Worldwide Interbank Financial Telecommunication (SWIFT) as well as export bans.

The decision taken by the leadership of the Russian Federation at the end of March 2022 to introduce a new ruble payment mechanism for European buyers of Russian natural gas was an important step in providing support to the Russian currency and ensuring the transfer of payments into the Russian Federaion's jurisdiction. According to this new mechanism, the obligation to pay for natural gas deliveries is considered fulfilled when the ruble equivalent of required funds is credited to a ruble account of the Russian supplier in Gasprombank. Nevertheless, the systemic nature of the anti-Russian sactions and the European Union's embargo on Russian crude and refined oil to become effective in December 2022 – February 2023 will complicate further the problem of availability of freely convertible currencies required for foreign trade with other countries. Therefore, it is of the utmost importance to elaborate on possible systemic measures that would allow developing international trade of the Russian Federation without the freely convertible currencies.

This book examines the potential of clearing which is a mechanism of netting mutual claims and obligations without using foreign exchange reserves and proposes a method of implementing clearing in international settlements of the Russian Federation as one of such systemic solutions for export and import operations under imposed sanctions.

We aimed at achieving the following goals in this monograph. Firstly, we analysed a wide range of Russian / Soviet and foreign literature of fundamental and applied nature on the problem of implementing bilateral and multilateral clearing and of the equation of exchange within the quantity theory of money (QTM). Secondly, the book provides a

formulation of main conditions for introduction of clearing in foreign trade of the Russian Federation and introduces a scheme for settlements under bilateral and multilateral clearing arrangements. Thirdly, on the basis of the equation of exchange, we proposed a new method of defining a clearing currency (a unit of account) that we named the "uniclear" (derived from "the UNIt of account for CLEARing) and calculated exchange rates of national currencies of Russia and 151 other countries.

The methodological and academic background of our research comprised theoretical and applied works of Soviet and Russian economists on the issues of international settlements, clearing trade and pricing within the socialist integration process – works of Petr M. Alampiev, Anatoliy I. Bazhan, Oleg T. Bogomolov, Iosif A. Dymshits, Lev M. Gatovskiy, Alla G. Gryaznova, Valentin Yu. Katasonov, Grigoriy I. Khanin, Lidiya N. Krasavina, Ivan I. Kuzminov, Lev A. Leontyev, Dmitry A. Lukashevich, Lev I. Maizenberg, Aleksandr D. Nekipelov, Konstantin V. Ostrovityanov, Yuriy V. Piskulov, Dmitriy T. Shepilov, Aleksey M. Smirnov, Yuriy S. Shiryaev, Boris A. Shmelev, Viktor S. Utkin, Leonid B. Vardomskiy, Nina A. Zotova, Arseniy G. Zverev; studies on money circulation, the theory of money, inflation and the equation of exchange of Zakhariy V. Atlas, Aleksandr V. Buzgalin, Olga V. Butorina, Gleb G. Fetisov, Sergey Yu. Glazyev, Aleksandr N. Dubyanskiy, Vasiliy P. Dyachenko, Mikhail V. Ershov, Aleksandr G. Khudokormov, Andrey I. Kolganov, Aleksey L. Kudrin, Vladimir I. Maevskiy, Svetlana V. Mischenko, Sergey Yu. Malkov, Yuriy Yu. Ponomarev, Aleksey A. Ponomarenko, David I. Rozenberg, Grigoriy Ya. Sokolnikov, Stanislav G. Strumilin, Svetlana N. Tretyakova, Pavel V. Trunin, Mark M. Usoskin, Leonid N. Yurovskiy; works on the financial sector of the Russian Federation, monetary integration, the use of national and supranational currencies within the Eurasian Economic Union (EAEU) and the Eurasian integration in general by Aleksandr I. Ageev, Kirill L. Astapov, Dmitriy R. Belousov, Stanislav M. Borisov, Oleg V. Buklemishev, Yuriy A. Danilov, Sergey M. Drobyshevskiy, Sergey Yu. Glazyev, Lyubov I. Khomyakova, Aleksandr Yu. Knobel, Aleksey V. Kuznetsov, Vyacheslav S. Kuznetsov, Evgeniy L. Loginov, Mikhail A. Minchenkov, Viktoriya Yu. Mishina, Dmitriy A. Mityaev, Viktor Ya. Pischik, Dmitriy I. Polevoy, Sergey N. Ryabukhin, Oleg G. Solntsev, Igor G. Suvorov, Evgeniy Yu. Vinokurov, Vera V. Vodyanova, Maksim P. Zapletin, Mikhail V. Zharikov.

This monograph also rests upon a broad spectrum of studies of foreign economists on such issues as the quantity theory of money, composition of monetary aggregates, the equation of exchange and inflation – Avner Bar-Ilan, William A. Barnett, Ben S. Bernanke, Mark Blaug, Matteo Ciccarelli, Sean Collins, Meghnad Desai, Gerald Dwyer, Walter Eltis, Paul De Grauwe, Irving Fisher, Milton Friedman, Augusto Graziani, Enzo Groce, Rik Hafer, David Howden, Peter G. A. Howells, Thomas M. Humphrey, Sarwat Jahan, Mohsin S. Khan, Nicholas Kaldor, John M. Keynes, Paul Krugman, Marc Lavoie, Jinan Liu, Robert Lucas Jr., Michael McLeay, Karl Marx, Frederic S. Mishkin, Benoit Mojon, Basil J. Moore, Simon Newcomb, Dennis O'Brien, Yueh-Yun C. O'Brien, Maurice Obstfeld, Chris Papageorgiou, Don Patinkin, Arthur C. Pigou, Arthur J. Rolnick, Stephen Rousseas, Paul A. Samuelson, Jacques Sapir, Apostolos Serletis, Robert Skidelsky, Carl Snyder, Anna J. Schwarz, R. D. Theocharis, Clive Thorp, Michel Vale, Robert C. Vogel, John R. Walter, Guagang Wang, Warren E. Weber, Bruce White, Knut Wicksell, Geoffrey Wood; works on bilateral trade (bilateralism), clearing trade and international settlements by James M. Boughton, Frank C. Child, Asa K. Cusack, Paul Davidson, Jorge B. de Macedo, I. de Vegh, Margaret G. De Vries, Barry Eichengreen, Margaret S. Gordon, John C. Griffin Jr., Walter W. Haines, John R. Humber, Takekazu Iwamoto, John M. Keynes, Ivo Maes, Larry Neal, Thomas Oatley, Ilaria Pasotti, Gardner Patterson, Judd Polk, David R. Richardson, William Rouse, Robert Triffin; publications of specialists on the evolution of the Council for Mutual Economic Assistance – Josef C. Brada, Peter B. Kenen, Andras Köves, Kamilla Lányi, Marie Lavigne, Timothy W. Luke, Michael Marrese, Constantine Michalopoulos, Gábor Oblath, P. Pete, Dariusz K. Rosati, Jozef M. Van Brabant, Jan Vaňous; studies of Thomas Andersson, Terhi Kivilahti, Juhani Laurila, Kimmo Mettälä, Simon-Erik Ollus, Kaarina Ståhlberg, Heli Simola, Pekka Sutela on Soviet-Finnish clearing trade.

The list of references also includes legal acts of the EAEU, the President of the Russian Federation, the United States federal government, the Europan Commission; official documents and materials of the Council for Mutual Economic Assistance (CMEA), the International Monetary Fund (IMF), the World Bank, the United Nations Conference on Trade and Development (UNCTAD), the Organisation for Economic Co-operation and Development, the Bolivarian Alliance for the Peoples of

Our America, East African Community, the Common Market for Eastern and Southern Africa, the Organisation of Eastern Caribbean States, the Eurasian Development Bank, the International Bank for Economic Co-operation, the Bank for International Settlements, the Asian Clearing Union; official documents, reports and working papers by the Central Bank of the Russian Federation (Bank of Russia), the Bank for Foreign Trade of the USSR (Vneshtorgbank), the Federal Reserve System and Federal Reserve Banks of Atlanta and Richmond, the Europan Central Bank, the Bank of England, the People's Bank of China, the Bank of Canada, the Central Bank of Brazil, the South African Reserve Bank, the Reserve Bank of New Zealand, the Bank of Central African States, the Central Bank of West African States, the Central Bank of Egypt, the Bank of the Republic of Haiti, the Bank of Zambia, the Bank of Mauritius; reports of the Center for Macroeconomic Analysis and Short-Term Forecasting and the Vnesheconombank Institute; materials of the European NAvigator multimedia digital library and news agencies such as Bloomberg, Reuters and RosBusinessConsulting. Our study is based on statistical databases of the IMF, the World Bank, International Trade Centre (ITC) of the World Trade Organization (WTO) and the UNCTAD, Eurostat, the Bank of Russia, the Federal State Statistics Service, the Federal Reserve Bank of St. Louis, the European Central Bank, the Bank of England, the Bank of of Central African States, statistics portals on the World Wide Web such as Statista, Trading Economics, CEIC and TheGlobalEconomy.com.

In Chapter 1, we consider challenges that the Russian Federation is facing in its external economic activities under toughened Western sanctions. We identify five main stages of the evolution of the theoretical thought on the equation of exchange within the QTM, formulate four general conclusions based on the analysis of the theoretical approaches and define main research directions on this and related topics in the contemporary Russian academic literature.

Chapter 2 is devoted to the issue of implementing clearing payments in general. We describe main objectives of introducing clearing in international settlements and conditions necessary for transition of the Russian Federation to clearing payments under current circumstances. The history of clearing trade and payments in the world is thoroughly analysed, including the arrangements between the socialist states in the

1940s, within the CMEA from 1949 to 1991, between the Soviet Union and Finland during the period of 1951–1990, other socialist and Western states, between Western European countries in the 1930s – 1940s, within the European Payments Union from 1950 to 1958, between developed and developing countries in the 1940s – 1980s and between developing states from the 1950s onwards. Additionally, we examine different views on the Soviet experience of clearing agreements withing the socialist integration and Soviet-Finnish trade. Subsequently, we propose and describe two schemes of international settlements of the Russian Federation with its trade partners under bilateral and multilateral clearing arrangements.

The author's method of calculating the uniclear as a unit of account is presented in Chapter 3. We characterize the statitistical information of the IMF, the World Bank and the International Trade Centre, describe in detail the procedure of computing in two ways the clearing currency uniclear and exchange rates of countries that are potential participants in clearing agreements. Subsequently, we present our in-depth analysis of the results of calculations of the uniclear as a unit of account and exchange rates of national currencies against it across the 12-year period (from 2010 to 2021) for six groups of countries, namely the EAEU (uniclear-EAEU as a unit of account), for Russia, the member states of the Commonwealth of Independent States outside of the EAEU, Georgia and Ukraine (the clearing currency uniclear-CIS), for the countries of the EAEU and the CIS (the uniclear-EAEU-CIS as a unit of account), for BRICS countries, member states of the Shanghai Cooperation Organisation, the BRICS candidates, the SCO observer states and dialogue partners (clearing currencies uniclear-BRICS and uniclear-Eurasia-BRICS) and for 148 economies (the uniclear as a unit of account). Afterwards, advantages and drawbacks of the proposed method are outlined in the book.

In addition, the monograph contains 20 Annexes with statistical data that we employed in our calculations of the uniclear and exchange rates as well as calculation results for 148 considered economies for the period of 2010–2021. Annexes I–III provide statistics on countries' nominal gross domestic product (GDP) and GDP at purchasing power parity. Annexes IV–VI contain the results of our calculations of nominal and PPP exchange rates to the US dollar and nominal exchange rates

to the Russian ruble. The data on the dynamics of the broad money indicator in 148 countries in local currencies and in comparable values is compiled in Annexes VII and VIII. The first approach to the calculation of the uniclear and local currencies exchange rates with weights as countries' GDP shares in the total GDP is presented step by step in Annexes IX–XIII, which contain values of money velocity in 148 economies, GDP shares, adjusting coefficients alpha for all considered countries, deviations from the average velocity of money and exchange rates to the uniclear as direct quote. Annexes XIV–XVI illustrate the results of the second approach to calculations with weights as countries' shares in their mutual trade. The cross rates against the US dollar and the Russian ruble (direct and indirect quotes) that we computed via the clearing currency uniclear are provided in Annexes XVII–XIX, while Annex XX comprises average values of all indicators we calculated for 148 economies over a period of 2010–2021. The list of references consists of 259 official, scholarly, informational and statistical sources in Russian, English, French, German and Spanish languages.

The author carried out this study at the Non-Profit Organization "Research Institute for Competitiveness and Integration" (RICI). We are thankful to Mr. S.M. Skorodumov for his useful recommendations at the initial stage of our research. In this monograph, we have taken into account remarks and comments of state officials from the Bank of Russia, the Ministry of Finance of the Russian Federation (Minfin of Russia), Ministry of Economic Development of the Russian Federation (Minekonomrazvitiya of Russia) on our proposals as of 29 July 2022 regarding the implementation of bilateral and multilateral clearing for promoting Russia's foreign trade under sanctions.

The materials presented in this book can contribute to the realisation of measures according to item 12 "Building a system of foreign trade and financial instruments" of the Bank of Russia's document entitled "The financial market: new tasks under current circumstances" that was released for the public debate on 4 August 2022, specifically with regard to direction 4 – on the elaboration of mechanisms of bilateral and multilateral clearing. Besides this, our proposals on the method of employing the clearing payment system and calculating the uniclear as a unit of account can be taken into account while fulfilling "The Concept of Forming the Common Financial Market of the EAEU" approved by

the Supreme Eurasian Economic Council on 1 October 2019 (Decision No. 20) and "The Strategic Directions for Developing the Eurasian Economic Integration until 2025" approved by the Supreme Eurasian Economic Council on 11 December 2020 (Decision No. 12) in terms of developing the system of international settlements in international trade partly between the EAEU member states as well as with other countries and integration blocks.

We can draw the following conclusions from our study.

1. The implementation of clearing as a mechanism of netting mutual claims and obligations in foreign trade transactions is one of systemic solutions for fostering international trade of the Russian Federation under sanctions toughened recently by the Western states. Three main reasons determined such a conclusion, namely that (1) the Russian ruble is not a freely convertible currency; (2) the access of the Russian Federation to major hard currencies in the world (the US dollar, the euro, the pound sterling) has been severely restricted; (3) the process of switching from freely convertible currencies to transactions in rubles is hindered by contractual limitations, characteristics of the ruble exchange rate regime and the availability on the world market of substitutable goods in a number of industries offered by other states at competitive prices.

2. The Soviet experience in clearing trade and payments within the CMEA based on the transferable ruble confirmed importance of pricing principles for tradable goods, which is currently closely related to the issue of determining "fair" exchange rates of national currencies against a unit of account (a clearing currency). Contemporary floating rate regimes in many economies with fixed prices set in long-term contracts (excluding commodities) contrast with PPP-based fixed exchange rates of the CMEA member states' currencies and varying prices, inter alia for balancing clearing trade. However, the main drawbacks of the suggestions put recently forward by some Russian scholars on creating new units of account for clearing trade are precisely related to the lack of developed and clear methodology of calculating values of suggested units of account and their exchange rates to national currencies.

3. Given such circumstances, in this study, we proposed a transparent technique of calculating a "fair" exchange rate of national currencies

against the new unit of account (clearing currency) we called the uniclear. It is based on the equation of exchange from the QTM employing freely accessible and commonly acceptable statistical information provided by such international financial institutions as the IMF, the World Bank and the International Trade Centre of the WTO and the UNCTAD.

4. Our analysis of more than 100 scholarly sources on the QTM and the equation of exchange allowed us to identify five critical stages in the evolution of theoretical thought on this topic:

4.1. During the first stage that lasted from the 16th century to the middle of the 19th century, Nicolaus Copernicus, Jean Bodin, John Locke, Charles Louis de Montesquieu, David Hume, David Ricardo, James Mill as well as Joseph Lang, Karl Heinrich Rau and Pierre Émile Levasseur outlined the general pattern of prices being influenced by the quantity of money in an economy.

4.2. Within the second stage, in Volume 1 of Das Kapital published in 1867, Karl Marx formulated the law of the circulation of money in the algebraic form stating that the volume of money in an economy is equal to the sum of commodity-prices divided by the number of turnovers of homonymous units of a currency during a certain period of time. Under the gold standard, K. Marx was of the opinion that the sum of prices determined the amount of medium of circulation in an economy, and not vice versa. Therefore, he was de facto the founder of the theory of endogenous money that would develop in the second half of the 20th century.

4.3. At the third stage (from the late 19th century to the first quarter of the 20th century), Simon Newcomb presented in 1885 the equation of exchange in a classical form: *volume of currency* V × *number of currency turnovers* R = *industrial circulation of goods* K × *their prices* P. This formula was called the "equation of societary circulation", and it was close to the algebraic form of the law of the circulation of money by K. Marx. Irving Fisher complemented S. Newcomb' analysis of cash circulation by adding bank deposits subject to check ($MV + M'V' = \Sigma pQ$ or PT) and revealed that the purchasing power of money was a reflection of the price level for goods and depended on the volume of (1) money M in circulation and (2) bank deposits subject to check M' (I. Fisher did not recognize bank deposits as money but as a medium of exchange), the velocity of (3) money V and (4) bank deposits subject to check V', (5) the volume of trade T (in turn, ΣpQ denotes a sum of goods sold / purchased in quantity

Q for price *p*, whereas *P* denotes a sum of prices of goods). I. Fisher also formulated the fundamental principles of the QTM that remained valid for the next several decades, such as the proportionality of changes in the quantity of money in circulation and prices; the one-way impact of the quantity of money on prices; non-neutrality of money in the short run and its neutrality in the long run; independence of money supply and money demand; the impact of the quantity and quality of labour force, fixed assets, the level of technological development on changes in relative prices in the long run under full capacity in an economy; the influence of institutional factors on the velocity of money, which remains more or less stable.

4.4. The forth stage from the end of the 1940s to the beginning of the 1970s was connected with the formulation by Milton Friedman of main principles of the contemporary analysis of money demand and supply within the theory of monetarism. This analysis comprised three key components, the first one being dynamic analysis of the equation of exchange and division of variables into nominal (the quantity of currency units) and real ones (their real purchasing power). The second one is incorporating national income into the right-hand side of the equation of exchange instead of the number of transactions and the "average" price: $MV = Y = Py$, where Y denotes nominal national income or GDP, P denotes price index, and y denotes real national income or GDP. Since then, GDP was used as a standard independent variable in regression models based on the equation of exchange. The third component refers to works of M. Friedman and Anna Schwarz on money supply in the USA throughout almost a 180-year period that stimulated other researchers to study long-term trends in other countries. M. Friedman distinguished four levels of monetary aggregates according to their diminishing liquidity (M1, M2, M3 и M4) and noted that the composition of monetary aggregates should be chosen depending on the objectives of studies. The main practical recommendation of M. Friedman was that the monetary authorities were advised to target the monetary aggregate M1 in order to manage business and public expectations about an anticipated level of inflation. However, his suggestions were successful only in the late 1970s – the begining of the 1980s, because the introduction of new banking products and the deregulation of the banking sector in the 1980s led to that the clear dependence of the level of inflation on the dynamics of the monetary aggregate M1 faded over time.

4.5. We identified four main directions at the fifth stage (the period of the 1970s to the 2000s) in the evolution of economic research on the topic of this book. The first direction is the rivalry between monetarism and the theory of endogenous money represented by Nicholas Kaldor, Basil J. Moore, Marc Lavoie and others on the sources of causation between the volume of money supply, prices and bank loans. In the Russian Federation this discussion also incorporates an issue of the role of the state in the economy (see the discussion between Aleksey L. Kudrin and Sergey Yu. Glazyev). The second direction comprises studies by Matteo Ciccarelli, Benoît Mojon and others on internal and external (global) factors causing price increases (imported inflation). The third direction is represented by works of William A. Barnett and his colleagues on adjusting the method of calculating monetary aggregates by assigning smaller weights to less liquid components and on the use of Divisia Index for monetary aggregations. Finally, the fourth direction is a discussion on the possible inclusion into monetary aggregates of retail overdrafts that are de facto analogous to cash and can be immediately used by bank clients increasing the overall demand for money, as well as credit cards operations (Avner Bar-Ilan, David Howden, Jinan Liu, Apostolos Serletis et al.).

5. In reality, the imperatives of I. Fisher's formula (the equation of exchange) were implemented in a systemic way for the first time in the USSR (approximately 50 years before their implementation in the Western states). With the further socialisation of means of production, the state control of prices and the monopoly of foreign trade, this policy allowed achieving price stability during next decades until the second half of the 1980s.

6. Our main conclusions from the analysis of the development of theoretical thought on the equation of exchange and the QTM can be summarized as follows:

6.1. A unified and comprehensive list of types of money and their substitutes or components of monetary aggregates has not been produced yet, and the composition of monetary aggregates has not been harmonized even across the OECD member states. There is a general consensus only about the most liquid aggregates and about the monetary aggregate called "broad money" which is present in the IMF's statistics.

6.2. The discussion on the equation of exchange and interdependencies between the volume of money in an economy and

prices can be explained to a great extent by differences in understanding among scholars what money actually is. In this regard, we composed a list of aggregates employing "Monetary and Financial Statistics Manual and Compilation Guide" of the IMF last issued in 2016, the data from the Bank of Russia, central banks of countries with reserve currencies, the eurozone, the OECD as well as five functions of money identified by K. Marx. The monetary aggregate M0 (money as a medium of circulation and hoarding) comprises cash in circulation that enables functioning of the retail and services sector and is also used by the population as a medium of hoarding outside the banking sector. The monetary aggregate M1 (money as a medium of circulation, hoarding and payment) consists of M0 plus transferable deposits, demand deposits belonging to the population, companies and organisations that are used in wholesale and retail trade, for non-cash payments between companies and organisations. Limited retail overdraft can also be included into this aggregate. Further, the monetary aggregate M2 (money as a medium of circulation, hoarding and payment) comprises M1 as well as savings and time deposits of the population, companies and organisations plus interest accrued. Finally, the monetary aggregate M3 (money as a medium of circulation, hoarding, payment and universal money) includes time deposits in foreign currency and interest accrued, money market fund shares, repos and debt securities issued by credit organisations.

6.3. It is important to balance indicators between the left-hand side (the monetary sector) and the right-hand side (the real sector) of the equation of exchange. When expanding monetary aggregates from M0 / M1 to M3 on the left-hand side, one should also use broader components of inflation on the right-hand side by including not only consumer price index but also producer price index or GDP deflator. It is critical in calculations especially for those economies where values of consumer and producer price indices differ consistently.

6.4. The velocity of money from M. Friedman's version of the equation of exchange ($V = Y / M$) can be also interpreted as the volume of GDP produced per one unit of money over a certain period of time, or alternatively as the volume of GDP that is served by one unit of currency during a unit of time. In this case, it is possible to calculate the average volume of GDP in the world that is produced per one unit of currency. And this indicator could become an objective foundation for

a new unit of account (a clearing currency) that we called the "uniclear" and for calculation of "fair" exchange rates of national currencies against the uniclear.

7. From the contemporary body of literature of Russian specialists, we identified the following major research streams. The opportunities for switching international settlements in foreign trade of the Russian Federation to local currencies is the topic of studies within the first stream (S.Yu. Glazyev, Oleg V. Buklemishev, Lidiya N. Krasavina et al.). The second stream incorporates works on the possible creation of the monetary union and monetary harmonization within the CIS and the EAEU (Sergey M. Drobyshevskiy, Aleksandr Yu. Knobel, Evgeniy Yu. Vinokurov and others) as well as on the introduction of clearing trade within the EAEU and the creation of new units of account (Viktor S. Utkin, Dmitriy R. Belousov, Oleg G. Solntsev, Igor V. Pilipenko and others). The third area of research is represented by publications on dual-circuit monetary and financial system (Sergey N. Ryabukhin, Mikhail Minchenkov et al.) and on debt monetization in the Russian economy (Vladimir I. Maevskiy and others).

8. The main task of clearing trade and payment system is to facilitate international trade under conditions of non-convertability of a local currency and restricted reserves of freely convertible currencies. The clearing payment mechanism implies that national currencies do not cross national borders; an export / import balance is expressed in a unit of account that can be any currency of members of a clearing agreement, a special clearing currency or one of freely convertible currencies; surplus or deficit can be reduced by importing or exporting respectively from / to other member(s) of a clearing agreement. In case there is a non-market-based mechanism of pricing and the exchange rate determination, an additional agreement is needed to determine the procedure of calculation of national currencies' exchange rates against a clearing currency and the pricing principles. Under multilateral clearing arrangements, netting of claims and obligations occur between three or more states, and, in this case, market-based pricing is more preferable as it allows excluding the possibility of incommensurable trade between participant countries.

9. The most intense usage of clearing trade bilaterally and multilaterally took place in the 1930s – 1980s in Western Europe, between

countries with planned economies within the socialist integration led by the USSR as well as between developing and developed states. Later on, this type of trade organisation was mostly replaced by trade using freely convertible currencies.

9.1. Bilateral clearing trade was quite a successful way of promoting international trade in Europe during the economic crisis of the 1930s. The implementation of clearing instruments before the Great Patriotic war also enabled the Soviet Union to develop trade with European states under Western sanctions. Nevertheless, the clearing agreements concluded between Nazi Germany and countries of Southern Europe eventually resulted in exporting of goods and foods on credit that Germany never settled until its defeat in the Great Patriotic war.

9.2. After World War II, clearing trade and payments became even more widespread across the world enabling countries on different stages of development (1) to secure importing markets for their goods, (2) to expand their trade under conditions of non-convertibility of national currencies; (3) to save gold and foreign exchange reserves for international settlements; (4) to promote more actively intra-regional trade.

9.3. For Western states (predominantly for countries of Western Europe; for Japan as well) the implementation of bilateral and multilateral clearing arrangements (within the European Payments Union from 1950 to 1958) was one of the steps on their way to full convertibility of their national currencies as well as for the introduction of the euro as a common currency. When proclaimed objectives had been achieved, the European Payments Union was dissolved, and clearing trade was subsequently developed with socialist and developing countries only.

9.4. Initially, the development of clearing trade between the planned economies was following the way of the Western European states, namely the conclusion of bilateral, then trilateral and multilateral clearing agreements within the CMEA with the International Bank for Economic Co-operation as a clearing house. It was assumed at the outset that socialist countries would find themselves in a beneficial position due to the state monopoly of foreign trade and foreign exchange transactions which would allow balancing export and import operations in a planned manner. In the 1950s, the USSR kept price unified and stable for all its trade partners ensuring the commensurability of the exchange. Moreover, at the turn

of the 1940s – 1950s, the clearing trade mechanism was expected to encompass also trade with the market economies.

9.5. Nonetheless, when the CMEA member states progressed to multilateral clearing trade in 1964 with transferable ruble as a unit of account, the process of planning export and import deliveries between countries was still organised on the bilateral basis. As a result, there were differences in pricing practices that implied non-equivalence of the exchange restraining intra-regional trade. Moreover, initiatives on the formulation of the basis for socialist prices were postponed, and world prices were taken as a reference, which were adjusted after the year of 1975 using moving average of world prices during previous five years. On the one hand, this method allowed excluding the speculative factor from trade, and, on the other hand, it evoked some discontent in the USSR as prices for energy resources sold to the CMEA member states were lower than global spot prices.

9.6. Insufficient strategic perspectives in the 1970s – 1980s, not very clear development plans, slow enhancement of the CMEA mechanism in general and of the multilateral clearing trade and payment system in particular, the unwillingness of the USSR as the leading country to carry on being an engine of the socialist integration – all these factors led to the dissolution of the CMEA and the abolishment of clearing with the transferable ruble as a unit of account. And it happened at the time, when integration processes in economic relations and international settlements started dominating in all other regions of the world. In fact, socialist international relations had been always lagging behind national economic development priorities of the CMEA member states, and this problem had never been resolved. Although, on the other hand, in comparison to market economies, less developed intra-regional trade within the CMEA, which accounted for ca. 6 per cent of the global trade in the second half of the 1980s, whereas these countries accounted for ca. 17 per cent of the world's GDP, can be explained by the evident self-sufficiency of the planned economies.

9.7. Nevertheless, many specialists evaluated the Soviet-Finnish clearing trade / payment experience exceptionally positive, though this clearing arrangement which was in place for 40 years was cancelled by the USSR as well. We can underscore the profound elaboration of the list of goods traded using the clearing mechanism and mutual

interest of both parties in trade promotion explained inter alia by an advantageous economic-geographical location of Finland that served de facto as a bridge between the Western European integration and the CMEA integration. We believe that these factors could be relevant at present for the Russian Federation as well, when the possibility of implementing clearing payment system with countries within the Eurasian integration is considered.

10. All assessments of the USSR's clearing trade and payment experience in the Russian-language literature can be divided into two groups. The first one is represented by publications that reveal the innovative nature of the transferable ruble (Valentin Yu. Katasonov, Anatoliy I. Bazhan) and highlight the effectiveness of Soviet-Finnish clearing trade (Yuriy V. Piskulov). The second groups focuses more on a critical analysis of the multilateral clearing mechanism within the CMEA (Aleksandr D. Nekipelov, Leonid B. Vardomskiy). The majority of Western specialists produced neutral to negative assessments underlining inability to achieve "full transferability" of the transferable ruble, the existence of so called "hard" and "soft" goods in the CMEA countries' trade, persistent dependency of the Soviet Union on foreign technologies, hidden subsidizing of the CMEA member states at the end of the 1970s – the beginning of the 1980s through lower than global energy prices, slowing economic growth of the USSR and the European CMEA member states (Jozef M. van Brabant, Marie Lavigne, Michael Marrese, Jan Vaňous and others). At the same time, some scholars, such as Josef Brada, emphasized that it was not quite correct to evaluate planned economies' experience from the Western standard viewpoints. And, at the same time, he managed to appreciate the advantages of the socialist integration using the tools of international trade theory and new institutionalism. The works of the economists from the countries of Central and Eastern Europe – member states of the CMEA were characterised by a balanced approach, constructive suggestions aimed at improving the CMEA system and their willingness to preserve the integration with the USSR and certain Union Republics with common border during the transition to a market economy at the end of the 1980s – the beginning of the 1990s (Andras Köves, Kamilla Lányi, Dariusz K. Rosati). In turn, the Finnish economists appraised very positively bilateral clearing trade / payment system with the USSR (Terhi Kivilahti,

Juhani Laurila, Pekka Sutela et al.) and accentuated the counter-cyclical character of trade with the Soviet Union, the higher level of prices for Finnish goods reflected in the trade agreement in comparison to the international price level, access to third markets obtained via the clearing agreement and the expanded demand for Finnish manufactured products, opportunities to plan capacity utilisation at Finnish enterprises in the long run and additional jobs created in the economy.

11. From our point of view, the main principles of introducing clearing payments for the Russian Federation can be formulated as follows: (1) the ability of this mechanism to ensure access of Russian companies to guaranteed markets; (2) export and import of goods and services using world "fair" prices (some discounts to compensate for additional risks can be offered to importers of Russian goods); (3) in the process of launching clearing payment system, it is reasonable to employ to the extent possible already existing infrastructure, such as the Eurasian Development Bank, the Interstate Bank, clearing / payment systems in South Asia, Latin America and Africa; (4) a stable exchange rate of the ruble to the uniclear is preferable to ensue better balancing of export and import operations; (5) the way of defining "fair" exchange rates of national currencies to the unit of account is to be transparent.

12. The overall framework of bilateral and multilateral clearing payment systems looks as follows:

12.1. Bilateral clearing payments are conducted through central banks, specialised banks promoting foreign trade or other authorised international financial institutions. The two banks open clearing accounts to each other, whereas local commercial banks have corresponding accounts with their respective central banks or other authorised banks. Having shipped goods or provided services, a Russian exporter has his account credited by a commercial bank against the documents submitted, and a foreign commercial bank debits an importer's account and releases these documents to an importer. Two central banks conduct two mutually offsetting operations, namely debiting the corresponding account of the importer's commercial bank in local currency and the clearing account of the central bank of the importer's origin in a clearing currency and crediting the clearing account of the central bank of the exporter's origin (Russia) in the clearing currency and the corresponding account of the exporter's commercial bank in local currency.

12.2. Under multilateral clearing payment framework, instead of central banks of two countries, there is a single bank for international settlements where all authorised banks of the member states of a clearing agreement have their clearing accounts in a clearing currency and corresponding accounts in their local currencies opened. The sequence of operations for a Russian exporter is almost the same, taking into account that the conversion of money from a local currency to a clearing one and vice versa is done in a single clearing house.

12.3. Taking into account modern communication facilities, countries' balances in a clearing currency and netting of mutual claims and obligations between central banks under bilateral clearing arrangements and within an authorised bank for international payments / settlements for different states under multilateral clearing agreements can be processed on a daily basis. In case of deficit, the remaining balance can be financed by a reserve currency, such as the yuan, or direct delivery of goods (barter). To ensure a non-stop payment process for shipments, an exporter can provide technical credits to an importer on the pre-agreed terms.

13. In accordance with the equation of exchange, our method of defining the clearing currency rests upon the understanding that an exchange rate or purchasing powers of two currencies are at a one-to-one level in case two equal volumes of money *M* in circulation in two states serve two equal masses of goods and services produced in these two economies (which are equal to countries' GDP according to M. Friedman). Therefore, an exchange rate of one currency to another depends on a ratio of the velocity of money in a first country to the velocity of money in a second country, which we denoted as coefficient alpha. Therefore, the exchange rate of the first currency to the second one is inversely proportional to coefficient alpha. In turn, the value of the clearing currency uniclear is calculated as a weighted average of velocities of money in the considered economies, whereas countries' shares in total GDP or mutual trade (or other appropriate indicators) can be used as weights in this formula. Ultimately, for the countries participating in a clearing arrangement, exchange rates of national currencies to the uniclear can be calculated by dividing exchange rates of these currencies against a currency, in which comparable statistics is provided, by coefficient alpha. As a result, besides monetary aggregates and GDP volumes, nominal exchange rates of local

currencies against a currency used in statistics as a measure of value also affect exchange rates of these currencies to the uniclear.

14. Since we use nominal GDP as a variable for the right-hand side of the equation of exchange, we have to employ the broadest monetary aggregate for the left-hand side, accordingly. Such an aggregate is to take into account the maximum number of functions of money (the medium of circulation, payment, hoarding and universal money) that circulate in an economy with different pace, namely: (1) cash in circulation and circulation through debit, credit and overdraft cards: (2) non-cash circulation between companies and organisations that form and use their working capital; (3) money circulation connected with investments in fixed assets of companies and organisations; (4) money circulation serving companies from the services sector. The fifth function of money, namely the measure of value, is revealed when export and import operations are netted against each other forming a country's trade balance. As a result, we chose to utilise such an indicator as broad money on an annual basis, which matches best the above-mentioned criteria and is quantifiable as the IMF (International Financial Statistics database) and the European Central Bank provide relevant statistics on broad money. Apart from this, we also employed the World Bank data on annual GDP in local currencies, in current US dollars and in current international US dollars at PPP (World Development Indicators database) as well as the data provide by the International Trade Centre on trade of goods between countries.

15. The process of calculating the clearing currency uniclear and exchange rates of local currencies against it included six steps:

15.1. The first step was to convert the data on broad money in local currencies into a single currency to ensure comparability of numbers in the numerator (nominal GDP *Y*) and the denominator (broad money *M*) of the equation of exchange. Since the comparable statistics is provided by the IMF and the World Bank in US dollars, we calculated nominal exchange rates of national currencies to the US dollar and then converted broad money numbers in local currencies to obtain the country data on this monetary aggregate in US dollar terms as well.

15.2. Secondly, we computed the velocity of money (*V*) in every country by dividing GDP volumes in US dollars by corresponding broad money volumes. It should be noted that velocities of money in economies

remain the same for numbers expressed in local currencies and in a single currency (the US dollar) because GDP values in the numerator and broad money values in the denominator remain proportionate.

15.3. Thirdly, the weighted average velocity of money was calculated for the countries considered which, ultimately, is the unit of account (the clearing currency) that we called the uniclear. Two kinds of weights were used for calculations, namely (1) countries' GDP shares in the total GDP of countries involved, and (2) countries' shares in their mutual trade.

15.4. Fourthly, we received adjusting coefficients alpha that account for differences between velocities of money in every country and across all considered states. Coefficents alpha were calculated by dividing annual velocities of money in each country by values of the clearing currency uniclear in each corresponding year.

15.5. The fifth step was to compute exchange rates of national currencies against the uniclear as a unit of account (direct quote) by dividing values of exchange rates of local currencies to the US dollar by adjusting coefficients alpha. In case of the US dollar itself, the clearing currency became the base currency and the US dollar – the counter currency, respectively.

15.6. In step 6, to enable further comparisons and validations of our calculations, we also computed cross rates of national currencies against the US dollar (direct quotes) and the Russian ruble (direct and indirect quotes) via the uniclear. These exchange rates were obtained by dividing exchange rates of local currencies to the uniclear by exchange rates of the US dollar and the Russian ruble to the uniclear, accordingly (and vice versa for indirect quotes).

15.7. We performed our calculations for a 12-year period from the year of 2010 to 2021 for the following groups of countries: (1) Russia and the member states of the EAEU (5 economies); (2) Russia, the CIS member states outside of the EAEU, Georgia and Ukraine (7 economies); (3) member states of the EAEU, the CIS, Georgia and Ukraine (11 economies); (4) five countries of BRICS; (5) Russia, member states of the CIS outside of the EAEU, Georgia, Ukraine, BRICS members and candidates, the SCO members, observer states and dialogue partners (22 economies); as a way of posing a question on appropriateness of our proposed method and to reveal general trends – (6) for Russia and other 147 countries in the world including 19 member states of the eurozone.

16. The results of our calculations allowed us to draw the following conclusions:

16.1. We found a very strong correlation between the growth of money supply across countries considered during 2010–2020 and respective consumer price indices (the correlation coefficient was equal to 0.85) and an even stronger association with the growth of GDP deflator (at the level of 0.99). This outcome confirmed our earlier finding that proportionate indicators should be used for the right-hand side and left-hand side of the equation of exchange.

16.2. We also revealed the trend of diminishing velocities of money with respect to increasing countries' GDP per capita values: on average negative 0.30 per cent for one per cent of countries' GDP per capita increase for all 148 states considered, and negative 0.34 per cent for 102 middle-income and low-income economies (according to the World Bank methodology). The explanation of such developments lies in diversified structures of advanced economies, sophistication of production cycles in their industrial sector and the developed tertiary sector. All that factors lead to increased volume of less liquid monetary components, which nevertheless are simply added up to the M0 / M1 monetary aggregates.

16.3. Countries / the currency zone with reserve currencies are characterized by velocities of money which are close to one (the USA – 1.08 turnover, the eurozone – 0.95 turnover during 2010–2021) or less than one turnover a year (the United Kingdom – 0.68, Japan – 0.41). On the one hand, it was the result of expansionary monetary policies, and, on the other hand, it happened due to large portions of these currencies being in circulation abroad. The velocity of money in China with the yuan included by the IMF into the SDR basket of currencies since 2016 exhibited a very low rate as well (0.52 turnover). Since these countries account for a large share of the world's GDP and trade, they influenced the uniclear (a weighted average of velocities of money) across 148 states to a great extent lowering its value (1.07 turnover on average over a period of 2010–2021). The region of the EAEU and the countries of the CIS outside of the EAEU (plus Georgia and Ukraine) demonstrate in general quite high levels of velocities of money (1.92 and 3.15 turnovers, respectively).

16.4. The average velocity of money for Russia in 2010–2021 was 1.78 turnover per year. Therefore, the average exchange rate of the

Russian ruble against the uniclear (31.60 rubles per uniclear), when doing calculations for 148 countries, was stronger than its average nominal exchange rate against the US dollar (51.69 rubles per US dollar), and it was closer to the exchange rate at PPP (21.83 rubles per US dollar in 2010–2021). It is important that our method allowed predicting almost exactly the PPP conversion factor during 2010–2014 (the result was 18.81 rubles per US dollar calculated via the uniclear against 18.87 rubles per US dollar at PPP). In the following years, the exchange rate of the ruble to the uniclear was affected by an almost twofold devaluation of the ruble in late 2014 to the beginning of 2015.

16.5. In general, the dynamics of cross rates of national currencies of 38 countries (out of 148 states) against the US dollar calculated using the uniclear correlated with their PPP conversion factors at the level of 0.9 and higher. And for 21 countries, deviations of calculated cross rates to the US dollar via the uniclear from their PPP exchange rates did not exceed 10 per cent over the 11-year period. Therefore, our method allows predicting to a great extent exchange rates of these local currencies against the US dollar at PPP.

16.6. One of the main features of the suggested technique is that cross rates of national currencies against each other are constant on a yearly basis regardless of how many countries are involved into calculations. A cross rate between national currencies of two countries depends on their nominal exchange rates against a currency used for international comparisons (the US dollar) and their velocities of money, which, in turn, do not change for calculations in local currencies and US dollars (because of the proportionality in the conversion factor for GDP and money supply values). At the same time, exchange rates of national currencies against the uniclear vary proportionally to changes in values of the uniclear (which is the weighted average of velocities of money across countries taken into account) and depend on the composition of countries involved into calculations.

16.7. For 148 states, the use of countries' GDP shares in total GDP and countries' trade shares in their mutual trade as two types of weights result in the average deviation of the Russian ruble's exchange rate against the uniclear only by 4.9 per cent over a period of 2010–2021. It was due to inclusion of a large number of countries into calculations of the uniclear that levelled off possible differences in the results.

16.8. For countries at the same level of economic development, an increase of the velocity of money in one country leads to its currency being appreciated against other currencies, and vice versa. Therefore, in order to lower exchange rate of a national currency to the uniclear and other currencies, a country's central bank and central government through budgetary policy have to increase money supply in an economy and foster investments into non-current assets. Similarly, when cross rates are calculated via the uniclear, the Russian ruble was found depreciated against currencies of countries with higher velocity of money than in Russia and appreciated against currencies of countries with lower velocity of money.

17. Our computations for Russia and groups of countries of the EAEU, the CIS, BRICS and the SCO revealed stable dependence of exchange rates of local currencies to the uniclear on values of coefficient alpha. The higher is the value of the uniclear, the lower is the coefficient alpha, and that leads, in turn, to appreciation of the uniclear as a unit of account and depreciation of local currencies against the uniclear, and vice versa. In our calculations for BRICS and the SCO, we also used the data on GDP and broad money for four countries that participate in integration processes within these organisations, but did not provide statistics for whole period of 2010–2021. These four countries are: Argentina (2010–2017), Iran (2010–2016), Saudi Arabia (2010–2017) and Sri Lanka (2010–2019).

17.1. When calculating with weights as countries' GDP shares in total GDP for the group of five member states of the EAEU (the average velocity of money in 2010–2021 was 1.92 turnover), the exchange rate of the Russian ruble to the uniclear was 56.39 rubles per uniclear (the average velocity of money in Russia was at the average level of 1.78 turnover). For Russia, countries of the CIS (outside of the EAEU), Georgia and Ukraine (1.98 turnover) the exchange rate was on average 58.64 rubles per uniclear; for 11 countries of the EAEU and the CIS including Georgia and Ukraine (2.08 turnovers) – 61.87 rubles per uniclear; for five members of BRICS (0.85 turnover) – 24.35 rubles per uniclear; for the group of 22 states including Russia, the CIS (outside of the EAEU), Georgia, Ukraine, BRICS, the SCO, candidates for BRICS, observer states and dialogue partners of the SCO (1.03 turnover) – 29.07 rubles per uniclear. On average, an increase of coefficient alpha by a value of 0.1 resulted in an appreciation of the Russian ruble against the uniclear by 3.81 rubles, all other things being

equal. In relative terms, an increase of coefficient alpha by 1.0 per cent induced a 1.0 per cent appreciation of the ruble to the uniclear.

17.2. By the same token, our calculations with weights as countries' shares in their mutual trade cause an increase in values of the uniclear due to smaller shares of China and Russia. Consequently, the average velocity of money for five EAEU countries increased to 2.37 turnovers, whereas the Russian ruble depreciated to 70.14 rubles per uniclear throughout 2010–2021. For Russia, the CIS countries, Georgia and Ukraine the average velocity of money was 2.34 turnovers and the average exchange rate of the ruble – 72.32 rubles per uniclear; for the EAEU and the CIS countries (2.42 turnovers) – 72.98 rubles per uniclear; for BRICS members (1.01 turnover) – 29.85 rubles per uniclear; for the Russian Federation's partners in the CIS (excluding the EAEU), BRICS and SCO (1.32 turnover) – 38.08 rubles per uniclear. The use of these values for regression analysis revealed the following relationship – an increase of coefficient alpha by 0.1 led to an appreciation of the Russian ruble by 6.08 rubles, and a relative increase by 1.0 per cent resulted in an appreciation of the ruble against the uniclear by the same 1.0 per cent.

18. There are several advantages of our method of calculating the uniclear as a unit of account and exchange rates of local currencies. The first one is the transparency of the unclear calculation procedure and the minimum number of statistical indicators required for computations. The second advantage is the use of the publicly available and universally recognised statistics of the IMF, the World Bank and the International Trade Centre. Versatility is the third advantage as this method of calculating the uniclear and exchange rates of national currencies can be applied to any number of countries that might wish to conclude clearing agreements with the Russian Federation. Robustness, predictability as well as flexibility in terms of using annual, quarterly and monthly data on GDP and broad money is the fourth advantage of our method. And the fifth advantage is an opportunity for alternative indicators to be included into the equation of exchange such as the sum of all values of goods and services produced in a economy (instead of just value added) and Divisia monetary aggregates of W.A. Barnett with less liquid components having smaller weights. In this case, exchange rates of more advanced nations' currencies with diversified economies would appreciate due to an increased value of an indicator in the numerator

(when an alternative indicator is used instead of GDP), or because of decreased value of an indicator in the denominator (in case of Divisia monetary aggregates) and the rising velocity of money, accordingly. Therefore, there are at least eight alternatives within our method for calculating the uniclear and exchange rates of national currencies: with two indicators used as weights, two different variables employed in the numerator and two parameters used in the denominator of the equation of exchange.

19. The method we proposed is not without some drawbacks, of course. The first one, is a notable effect of nominal exchange rate movements of national currencies against a currency which is used in international statistics (the US dollar in this case) to compare GDP and broad money indicators across countries considered. Coefficient alpha that we defined in this book essentially adjusts nominal exchange rates of national currencies towards their PPP conversion factors. The second drawback is a time lag between the current state of affairs and the time when statistics is released. As values of the uniclear and exchange rates of local currencies against it reflect the situation of a past period, relatively stable exchange rates of national currencies to the US dollar are more preferable. Thirdly, in case calculations are performed for countries with the same currency, their exchange rates to the uniclear might differ because of differences in GDP-to-broad money ratios. A useful alternative would be to add up relevant indicators of such countries for computing a common exchange rate as we did for the eurozone member states.

In conclusion, we should notice that the equation of exchange and the quantity theory of money have not lost their relevance and can be useful tools for applied research. The method of calculating the unclear as a unit of account (a clearing currency) we suggested in this book is transparent, versatile and has the potential for futher adjustments in the interests of the Russian Federation and partner states that would wish to conclude clearing agreements. It also provides clear imperatives for central banks and governments in terms of monetary and budget policies. Therefore, despite some disadvantages, this method of calculating "fair" exchange rates of national currencies for implementing the clearing mechanism in export-import operations under toughened anti-Russian sanctions can contribute to the intensification of the Russian Federation's international trade.

Information about the author

Igor V. Pilipenko is a Russian economic geographer and economist, Director of the Institute for Competitiveness and Integration (RICI). He received his Bachelor's (2001) and Master's (2003) degrees in geography, both *summa cum laude*, and PhD degree in economic, social and political geography (2004) from Lomonosov Moscow State University (Russia) with three (2001, 2002, 2002–2003) internships at the Geographical Institute and Faculty of Economics and Business Administration of the Eberhard Karls University, Tübingen (Germany), and MPA degree (2010) in Economic Policy Management from Columbia University in the City of New York (USA), School of International and Public Affairs (SIPA). He speaks Russian, English, German, Spanish and Ukrainian.

Dr. Pilipenko has 13 years of experience in research and teaching as well as 11 years of experience working on Russia, the CIS countries and Central and Eastern Europe (CEE) in the private sector and at international financial organisations in Russia, the USA, Czech Republic, and the United Kingdom. He worked at Lomonosov Moscow State University (2001–2012), the University of Economics, Prague (2010), the Financial University under the Government of the Russian Federation (2018–2019). He was also elected Vice-President of the European Geography Association (EGEA) (2004–2005) and elected Representative of the EGEA Eastern region that comprised EGEA entities in the CIS and CEE countries. Dr. Pilipenko also worked at the Russian office of the multinational automotive corporation DaimlerChrysler AG in Moscow (2002), at "Business Russia" (2006–2009) which is one of the leading business associations in the country, at the World Bank's headquarters in Washington, DC (2010) and its Moscow resident office (2010–2011), at the headquarters of the European Bank for Reconstruction and Development (EBRD) in London (2011–2018).

Dr. Pilipenko authored the book entitled "The Competitiveness of Nations and Regions in the World Economy: Theory, the Experience of Small Nations of Western and Northern Europe" (2005), for which he received the Medal of the Russian Academy of Sciences for Young Scholars in 2006. In his academic works published in 2003–2006, he introduced the concept of clusters into broad scholarly discussions in Russian economic geography and regional economics and compared it

with the Soviet theory of territorial-production complexes (TPC). In 2007, he was the first to formulate main principles and to suggest directions for cluster policy implementation in the Russian Federation. From 2006 to 2016, Dr. Pilipenko was the most cited young scholar in Russia in the field of economics (or was among the top-3 most cited young economists) and the most cited young Russian scholar in the field of geography.

His practical experience encompasses inter alia contributions to more than 40 proposals of "Business Russia", the Chamber of Commerce and Industry of the Russian Federation and the Russian Union of Industrialists and Entrepreneurs (RSPP) on improving the business climate in Russia. Dr. Pilipenko managed the research project on creation of "Barometer of Business Russia" (2008); he was co-author, editor and reviewer of Annual Reports of "Business Russia" (2007, 2008), reports of international financial organisations (from 2008 onwards) evaluating social and economic development and the reform process in Russia and other CIS states as well as of macroeconomic reports and forecasts. Dr. Pilipenko coordinated the organisation of 25 academic and business conferences and roundtables and participated in the organisation of 28 large-scale international events in Russia and 16 countries of Eurasia. He also perfomed financial analysis and evaluation of more than 300 investment projects in Russia and 35 countries in Europe, Asia and Northern Africa. For his work at the Board of Directors of the EBRD in the Office for the Russian Federation, Belarus and Tajikistan, Dr. Pilipenko received two Commendations of the Minister of Economic Development of the Russian Federation (2013, 2017) and a Commendation of the Minister of Economy of the Republic of Belarus (2017).

Igor V. Pilipenko was also an editor and co-author of the book "The Transition to a Market Economy and Structural Reforms in the Eurasian Economic Union (EAEU) Member States" published in 2019. In that monograph, using the uniform author's methodology, five teams of researchers from universities from all the EAEU members states carried out an analysis of economic reforms during the 1990–2010s in Armenia, Belarus, Kazakhstan, Kyrgyz Republic and the Russian Federation. In total, Dr. Pilipenko authored 79 academic works and made 86 presentations of his own research at international conferences in Russia, the USA, Germany, Spain, Finland, Slovakia, Lithuania, Estonia, the Netherlands and China.