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Foreword

Dear friends!

Allow me to congratulate the winners of the Contest for BRICS Young Leaders whose papers are published in this special issue of the BRICS Journal of Economics, partner of the Contest. No doubt, these articles bring to the BRICS agenda the most promising projects for promoting practical cooperation among the youth of our five countries.

The Contest for BRICS Young Leaders was held within the annual BRICS International School by the Russian National Committee on BRICS Research and supported by the Ministry of Foreign Affairs of the Russian Federation, the Alexander Gorchakov Public Diplomacy Fund and other partner organizations. The BRICS International School was initially established to train young professionals in BRICS studies through educational experiences focusing on fostering the pentalateral partnership of the BRICS countries. As the project evolves, we are proud to say that it has been widely contributing to building the pool of talented youth from BRICS and beyond.

On behalf of the Russian National Committee of BRICS Research, I would like to extend our gratitude and appreciation to the BRICS Journal of Economics for the support of the Contest as a part of the youth track within the Russian BRICS Chairmanship in 2020. Let me express my hope that the BRICS Journal of Economics will further expand its impact in promoting knowledge and cutting-edge research as one of the most forward-looking journals in the field of BRICS studies.

Since the creation of BRICS in 2009, the participating countries have made a significant progress in economic, technological, social, and humanitarian development, and have strengthened their positions in the institutions of the global governance. During its first decade, efforts of the BRICS countries became one of the key factors in world politics and global economic development.

This year Russia took over the Chairmanship in BRICS for the third time under the motto “BRICS Partnership for Global Stability, Shared Security and Innovative Growth.” Its main purpose was determined as raising standards and quality of life of the peoples of our five countries. The Chairmanship is built on the three pillars of BRICS strategic partnership — policy and security, economy and finance, and cultural and humanitarian contacts. As a part of its policy track, BRICS countries continued to promote universal principles of international law, central role of the United Nations in international affairs and contributed to forming of a more democratic and multilateral system of the global governance.

Efforts of the BRICS countries within economic pillar focused on the renewal of the Strategy for BRICS Economic Partnership 2025. The new Strategy emphasized trade,
investment and finance, support of the digital economy and sustainable development as its priority areas. By adopting the Strategy, the five countries expressed their commitment to strengthen cooperation within the BRICS businesses communities, to facilitate the reform of the global trade and financial system, to advance cooperation within the BRICS Contingency Reserve Arrangement and the New Development Bank. The BRICS countries prioritized working in the fields of innovation and technology and addressing the challenges of the Fourth Industrial Revolution, sustainable development, climate change, energy, infrastructure development and food security.

Within the humanitarian track, Russia prioritized strengthening of people-to-people contacts with the development of the youth track one of its core tasks. The BRICS countries continued strengthening youth exchanges in the fields of science, technology and innovation, volunteerism and entrepreneurship. It is illustrated by the comprehensive support of youth initiatives within the Russian Chairmanship and reflected in the XII BRICS Summit Moscow Declaration.

This year BRICS reached a number of practical agreements to support our economies to recover from the health crises. BRICS countries agreed to support small, medium and micro businesses to participate in international trade, to foster interbank cooperation and strengthen the role of the New Development Bank.

Certainly, the COVID-19 pandemic outbreak affected the Russian BRICS Chairmanship this year. The global healthcare crises and its implications for BRICS became the cross-cutting issue of discussions within the meetings at all levels and all fields of our cooperation. As an example of BRICS response to this challenge, the BRICS countries agreed to establish an early warning system for epidemiological threats and to develop specific steps for the legal regulation of medical products that will improve our capacities to combat similar threats in the future.

I am proud that the Contest for BRICS Young Leaders and the BRICS International School engaged so many capable young people to elaborate solutions addressing the most pressing issues for the global community. The innovative ideas to foster partnership and friendship among the peoples of BRICS proposed by the participants of these projects will bring a positive change. I am convinced that with the contribution of the young leaders to the BRICS agenda, we will be able to solve issues of international importance and to build a better world.

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Quantitative dynamics of intra-BRICS trade

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Abstract
The study uses an augmented gravity model to analyse intra-BRICS trade flows and the potential for establishing economic cooperation. It examines trade relations between BRICS with the help of the gravity model of international trade. Panel data from 2000 to 2017 were reviewed for bloc analysis of 20 trade partners. The analysis of the intra-BRICS trade flows is based on the Heckscher-Ohlin model. The results obtained confirm that the intra-BRICS trade relations have a sound positive impact on economic performance in these countries. Market size and economic index have a beneficial effect on the intra-BRICS trade flows. Market size is very elastic to trade, while trade tariffs and taxes within BRICS are manageable. Hence, the intra-BRICS trade has the potential to create strong economic ties within the member countries, and cooperation between the BRICS countries can have a significant influence on the globalisation of the world economy.

Keywords: BRICS, gravity, trade, Heckscher-Ohlin model, Linder hypothesis.

JEL: C01, C54.

Introduction
Trade is a phenomenal component of economic analysis at the national and international levels. It occurs because all factors of production are not collectively available at the place of production. Manufacturing, investment, and consumption activities do not
occur in one place, but are dispersed all over the globe. Every producer must borrow the required resources from a place where it is available in abundance. It also helps in reducing the disadvantages of an unbalanced geographical distribution of productive resources (Ohlin, 1952). Therefore, variability of productive resources determines international trade and plays a vital role in a country’s economic growth and development (Krueger, 1980). Consequently, every nation is engaged in international trade to meet the needs and requirement of its economy, so that to establish strong trade relations among states.

In the current scenario, given the growing need and importance of trade, international trade relations have become an indicator of globalisation. The existence of different trade blocs is evidence of the rapid globalization of the world. The BRICS nations are among the novices and represent an emerging trade bloc in this globalised era, which adds new dimensions to enhancing international trade relations. However, the question of whether BRICS is technically a bloc or not remains debatable (Iqbal & Rahman, 2016). BRICS is an acronym that refers to the association of five emerging countries, and the impact of this conglomeration was suggested by O’Neill (2001). He mentions that Brazil, Russia, India and China are emerging giants that are able to compete with advanced nations and should provide a way out of the world political and economic crisis. Each of these countries specializes in different areas. For example, Brazil is of global importance as a raw material base, Russia is recognized mostly for oil and gas, India is well known as a service provider, China dominates the manufacturing sector, and South Africa is valuable in terms of resource reserves (Kumar, 2013). Collectively, they make up 30% of the Earth’s land mass and cover 45% of the world’s population (Mazenda, 2016). According to a Goldman Sachs report, the economic and demographic influence of China and India indicate that their middle-class populations are increasing. This will increase consumer activities that will help the BRICS countries expand their economic activities and develop trade relations. Likewise, they are all among the emerging and dominating superpower economies of their respective regions (Przygoda, 2015). They are dynamic and charismatic rulers of their continents — Asia, Latin America, Europe, and Africa. Once interaction and negotiations with these countries have started, it becomes easy to spread and create trade relationships with other regions of the continent. Subsequently, their emerging economic cooperation qualities have a significant impact on the world economy. They are the major contributors to the world economy through their participation in international trade relations, international migration of human resources, and international investments (Nayyar, 2016). Therefore, trade is one of the main rationales for encouraging and smoothing international relations around the globe, as well as between the countries of the bloc. It also helps in earning customer feedback and gratification, which ultimately enhances the country’s productivity. In the context of trade relations, there is a need to assess different factors responsible for intra-BRICS trade and measures to strengthen trade relations between the BRICS countries. Generally, the gravity model is used to study the bilateral trade flows between the trading countries. However, this study uses a modified gravity model analysing the BRICS countries’ trade flows, which means that the model is specified, restructured and reparametrized in accordance with time series, cross-sectional or panel data series framework. The aim of the study is to examine the intra-BRICS
trade flows and trade potentials for the development of strong economic cooperation. This is an important topic, because these countries want to establish an economic bloc, for which they need economic cooperation, and trade can help in establishing strong relations within BRICS. Therefore, the article uses a modified gravity model to study intra-BRICS trade linkages.

1. Literature review

Exchange of goods is necessary at a time when all factors of production are not readily available due to geographical limitations, and producers must depend on supplier countries where resources are available in abundance. As a result, trade originates to meet the needs of consumers. This means that international trade helps in solving economic problems of a country.

The theory of comparative advantage states that a product should be sold from a country where the opportunity cost of a factor of production is lower compared to another trading country. As a result, all trading countries can enjoy trade benefits through trade relation. In 1930, Heckscher and Ohlin denounced Ricardo’s views and developed the factor endowment theory of trade. They assert that every nation has a different factor endowment, and it can enjoy a comparative advantage in its specialised factor of production. An exporting country should produce a commodity that requires cheap factors of production and is relatively abundant in nature, whereas import is a relatively scarce and expensive factor (Clements, 2007). Therefore, every trading nation can simultaneously profit from trading.

After World War II, there was a further evolution in trade theory, and major contributions were introduced by Vernon, Linder, and Samuelson, as they explained that international trade was based on comparative advantages, technical soundness of the industry, and demand for a product. In addition, Faderer (1982) mentioned that exports contributed to the growth and development of a country that depended on economies of scale and adequate allocation of resources. He failed to explain the long-term impact of exports on the economy of a country. Likewise, economic integration allows a country to benefit from scale of production and helps in the value chain process, reducing the burden of trade competition with developed countries (Foxley, 2010). The BRICS countries are still developing and following the traditional behavioural patterns mentioned in the classical theory of trade (Mazenda, 2016). The BRICS conglomerate, based on economic cooperation, stability, and security, aims to achieve market efficiency, FDI inflows, effective economies of scale, and better trade relations. In the era of globalisation and with the increasing number of trade blocs, new trade theories demonstrated (in addition to two-factors and two-country models) that trade could also depend on increasing the return to scale, imperfect competition, and product differentiation. Multilateral institutions have also played an important role in merchandise trade of BRICS (Rahman, 2016). Climate change issues in the BRICS countries are also relevant to the trading environment (Rahman & Turay, 2018).
We emphasize the importance of using the gravity model to study regional trading groups, currency union, economic union, political union, and other trade associations. The Regional Trade Agreement (RTA) helps in bilateral trade (Carrere, 2004; Vicard, 2011) and trade growth through free trade agreements (FTA) (Anderson & Yotov, 2013). Besides, empirical evidence indicates a positive impact of the RTA on intra- and inter-trade blocs in developed countries (Martinez-Zarzoso et al., 2009). The gravity model is used for trade creation and trade diversion effect of the RTA (Ekanayake et al., 2010), as well as in economic integration studies (Porojan, 2001; Martinez-Zarzoso & Nowak-Lehmann, 2003). It is also used in the analysis of the Andean Community, MERCOSUR (Frankel et al., 1994; Carrillo & Li, 2004), and the Preferential Trade Agreement (PTA) of various blocs (Martinez-Zarzoso, 2003). The gravity model is used several times to study trade preferences between two ASEAN and three RTA countries, EU trade preferences and other FTA countries. Similarly, it was used to check the involvement of the RTA in promoting international trade of OECD countries and non-OECD countries. The results show that there is a significant impact of the RTA on OECD in comparison to non-OECD countries (Kurihara, 2011).

Recent trade activity revealed the entry of the BRICS countries into the FTA and other regional trade agreements that are influenced by political and economic factors of their countries (Sharma, 2014). Regional introversion indices indicate that the BRICS countries are strongly influenced by global integration rather than regional integration. According to Jim O Neill (2001), BRICS are emerging economies aiming to create a new world order. They have the potential to expand world trade by bringing regional countries to international markets. Mishra et al. (2015) provide a theoretical and applied framework for studying trade relations of the BRICS countries with the help of the gravity model. It is established that Russian trade integration is based on the Heckscher-Ohlin framework, while other BRICS members adhere to the Linder hypothesis of trade pattern (Rasoulinezhad & Jabalameli, 2018). On the other hand, Besada and Tok (2014) argue about the importance of South Africa for the BRICS alliance. Its inclusion creates neoliberalism across the African continent that opens the gate to a broad market, trade, and investment for other members of BRICS. The concept of a soft balancing strategy unites them and helps to increase the focus on collaborative areas such as trade, security, stability, infrastructure development, and country representation. The alliance of these developing countries creates a platform for multilateral trade and regional economic cooperation between the BRICS countries. This strategic alliance focuses on sectoral cooperation, foreign policy instruments, and common interests of these countries, because they need economic cooperation, not a political forum. These countries need export reorientation that will help them in transforming their export from low value added production and basic processing of raw materials into more sophisticated merchandise goods (Kocourek, 2014).

The NTT doctrine states that strategic trade helps in the continuation of trade practices and an uneven power balance between rich and poor countries of the world (Sen, 2010). In 1991, Krugman gave a new dimension to trade relation and suggested that the increasing return to economies of scale and economic geography was an important consideration
for international trade. This implies that transportation cost is incurred to reach an efficient market location and provide resources for production. The gravity model helps in estimating general trade functions (Davidova, 2015). Bilateral trade between India and other BRICS nations is studied using the gravity model which shows that there is a positive relationship between GNP and volume of trade between the nations, but transportation cost shows negative influence in the context of trade (Mishra et al., 2015). Similarly, the panel data technique is used to study trade relations between Bangladesh and BRICS with the help of a modified gravity model in which GDP, per capita GNI, and real exchange rate are used as variables for drawing significant inferences (Kundu, 2015). Another study states that there is a slight drop in export activities as the distance between trading countries increases, and the greater the distance between them, the greater the drop in exports (Baha et al., 2015). Therefore, it is imperative to study the intra-BRICS trade flows and determine whether it is beneficial for economic cooperation or not.

2. Conceptual framework

The concept of BRICs dates back to 2001 when O’Neill, as chief economist at Goldman Sachs, weaved an acronym for four prominent emerging economies of the world: Brazil, Russia, India, and China. With the acronym modified, South Africa merged as the fifth developing country in 2010. BRICS has been outpacing other conglomerates across the globe in the recent years, strengthening economic ties among its members without challenging their idiosyncratic variations. These variations in trade activity and factor movement between economic entities depend on the economic mass of the entities in question. The gravity model of mapping economic liaison between two countries, even several subjects in some cases, derive its content from Newton’s law of gravitation. Newton’s proposition of universal gravitation provided the basis for the gravity model of economic interaction. First used by Tinbergen in 1962, the gravity model of economic integration rests on the assumption that the link between economies is a direct proportion of the economic mass and an indirect proportion of the distance between the economies investigated. The model extends assistance in searching for evidence in trade conglomerates, as well as in other characteristics such as migration, investment, etc.

According to Anderson and Wincoop (2003), the gravity model of economic interaction assumes the following mathematical form in the case of a two-country model:

\[ X_{ij} = \frac{Y_i E_j}{d_{ij}^2} \]

where \(i\) signifies the country of origin; \(j\) — the country of destination; \(d\) — the distance between the two countries \(i\) and \(j\).

The \(X_{ij}\) component measures the amount of goods/labour or any other factor of production that has passed between source \(i\) and destination \(j\), and indicates that it is positively linked to the economical mass of the country of origin and destination, while it is antagonistically related to the distance between the two economic entities. This distance can cover all the factors that restrict or minimize trade. However, it was found that the volume of the flow of goods and factors of production substantially corresponds
well to the forecast when numerous dummy variables were added in the traditional gravity model, such as common political boundaries, same dialect or language, similar trade arrangements, similar cultural and historical foundations, and much more of a similar nature. In addition, $X_g$ will only succeed in overcoming bilateral resistance and will fail to capture the overall negative impact of trade resistance on bilateral trade. For this purpose, the traditional gravity model, formally presented in equation (1), extended its scope to include a remoteness index designed to account for frictions resulting from bilateral trade. This additional component of the remoteness index $\sum_i d_{ij} / Y_i$ elaborated the ancient gravity model to constitute the average distance of entities from their associating entity in trade. This characteristic of the traditional model, which allowed to introduce the remoteness index to the original equation, took its origin from the fundamentals of the Newtonian gravity. Since each country of origin can trade with multiple destinations, similarly, any destination country can attract trade from innumerable countries of origin. This simple but noticeable debacle led to modification of the traditional gravity model into a structured gravity model that confronts the problem of general equilibrium of multiple origins and multiple destinations simultaneously.

The gravity model was first introduced by Ravenstein in 1889 to measure the movement of people from country to country; more specifically, the migration phenomenon. It was Tinbergen, who in 1962 applied this model to quantify trade flows between countries, though the fundamentals remained the same. Tinbergen’s understanding of the Newtonian gravity for explaining bilateral trade movements is rooted in the profession from which Tinbergen came. His deep knowledge of physics led him to venture into the study of the economics of trade applying the laws of physics. He served econophysics by shifting the rules of physics on trade relations. The use of the gravity model for studying international trade relations was further introduced by Poyhonen in 1963. Since then, there was an extensive deviation in the contents of the model. As more and more economic substance and international trade theories were incorporated, many explanatory variables were added, depending on the similarity or variation of several institutional factors. Among those who lend a voluminous extension to the gravity equation are the studies by Anderson (1979), Bergstrand (1985; 1989), Helpman (1987), Deardorff (1998), and Anderson and Wincoop (2003; 2004). These studies differ in that they include alternative forms of market conditions, as well as production and expenditure systems. Empirical content also exists in this concept of gravity modelling, wherein explanatory variables such as a number of preferential agreements, FTAs or RTAs, and association to mutual conglomerates are included in the structure of the gravity model. It is noted that trade is a function of income, trade policy, cultural affinity, and transport costs, whereas transport cost is a function of distance, geography, infrastructure quality, trade facilitation measures, transport technology, fuel costs, and trade policy (Beher & Venable, 2010).

In functional form,

\[
\text{Trade} = f(\text{income, policy, cultural affinity, transport cost}).
\]

\[
\text{Transport cost} = f(\text{distance, geography, infrastructure, trade facilitation, technology, fuel costs}).
\]
Therefore, it is a suitable trade model for studying the direction and magnitude of trade between BRICS. It is the task of the literature to address the issue of intra-BRICS trade, as these countries are looking for strong economic cooperation that needs a strong connection between economic conditions of the countries. To build intra-BRICS economic cooperation, it is necessary to establish trade relations, because trade is a continuous process that creates links between countries and leads to economic cooperation between them. Further, it is essential to study the factors affecting trade and the importance of distance between countries. In the gravity model, distance is considered as a proxy for trade costs.

3. Data and methodology

This study was conducted to search for empirical evidence regarding trade flows between the BRICS countries. The gravity model of international trade was used to analyse trade flows in the economic bloc. Subsequently, a panel data structure was formed to mutually capture the two-dimensional effect. It includes cross-sections, as well as a time-effect, so that trade flows between trading partners can be estimated during the period of the study. These cross-sectional units consist of 20 trade partners and cover the period from 2000 to 2017. Both time series and cross-sectional data are combined to form panel data for gravity analysis. Let $X$, $Y$, $D$, $P$ and $E$ represent such variables as export, GDP, geographical distance, population and economic index of globalization, respectively. The subscript $i$, $j$ & $t$ signifies exporting countries, importing countries, and time period of trade. The following Table 1 provides a detailed description of the variables and its source taken for the gravity analysis.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Codes</th>
<th>Units</th>
<th>Sources</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports</td>
<td>$X_{ijt}$</td>
<td>USD</td>
<td>UN COMTRADE database</td>
<td>Bilateral trade between the BRICS countries. 20 trading partners</td>
</tr>
<tr>
<td>GDP of exporting countries</td>
<td>$Y_{it}$</td>
<td>Current USD</td>
<td>World Development Indicators</td>
<td>It is calculated in terms of GDP. It is the sum of the gross values of goods and services produced in the countries at the market price. It is given in current USD</td>
</tr>
<tr>
<td>GDP of importing countries</td>
<td>$Y_{jt}$</td>
<td>Current USD</td>
<td>World Development Indicators</td>
<td>Trade cost is a proxy reflecting the geographical distance between the trading partners. It is calculated between the capital cities of two economic centres and the values are given in kilometers, which are extracted from the CEPII GeoDist database. It was developed by Head and Mayer (2002)</td>
</tr>
<tr>
<td>Distance between capital cities</td>
<td>$D_{ij}$</td>
<td>Kilometres</td>
<td>CEPII</td>
<td></td>
</tr>
</tbody>
</table>
Table 1. Continued

<table>
<thead>
<tr>
<th>Variables</th>
<th>Codes</th>
<th>Units</th>
<th>Sources</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population size of exporting</td>
<td>$P_a$</td>
<td>Number of</td>
<td>World Development Indicators</td>
<td>Linnemann (1966) extended the above equation to bilateral trade and introduced population size of exporting and importing countries</td>
</tr>
<tr>
<td>countries</td>
<td></td>
<td>people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population size of importing</td>
<td>$P_i$</td>
<td>Number of</td>
<td>World Development Indicators</td>
<td></td>
</tr>
<tr>
<td>countries</td>
<td></td>
<td>people</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic index of exporting</td>
<td>$E_a$</td>
<td>Index</td>
<td>ETH Zurich Economic Indicators</td>
<td>The economic dimension includes trade and investment flows, and restriction policies</td>
</tr>
<tr>
<td>countries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic Index of importing</td>
<td>$E_i$</td>
<td>Index</td>
<td>ETH Zurich Economic Indicators</td>
<td></td>
</tr>
<tr>
<td>countries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: Authors’ compilation.*

In Table 1, the GDP of both countries and the distance are considered from the basic gravity model. The population size is considered for the study of market size in relation to exporting and importing countries. The economic indices are proxy measures of trade and investment policies. The trade scenario and pattern of the BRICS countries are given in the Appendix. In addition, data from other variables is given in the Appendix as a graphical representation.

Table 2. Descriptive statistics

<table>
<thead>
<tr>
<th>Statistics</th>
<th>$X_{ijt}$</th>
<th>$Y_{it}$</th>
<th>$Y_{jt}$</th>
<th>$D_{ijt}$</th>
<th>$P_i$</th>
<th>$P_j$</th>
<th>$E_{it}$</th>
<th>$E_{jt}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>21.57</td>
<td>27.75</td>
<td>27.75</td>
<td>9.03</td>
<td>19.50</td>
<td>19.50</td>
<td>3.70</td>
<td>3.70</td>
</tr>
<tr>
<td>Median</td>
<td>21.63</td>
<td>27.90</td>
<td>27.90</td>
<td>9.05</td>
<td>19.08</td>
<td>19.08</td>
<td>3.73</td>
<td>3.73</td>
</tr>
<tr>
<td>Minimum</td>
<td>15.58</td>
<td>25.47</td>
<td>25.47</td>
<td>8.24</td>
<td>17.63</td>
<td>17.63</td>
<td>2.88</td>
<td>2.88</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.79</td>
<td>1.09</td>
<td>1.09</td>
<td>0.47</td>
<td>1.27</td>
<td>1.27</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>Skewness</td>
<td>-0.44</td>
<td>0.13</td>
<td>0.13</td>
<td>-0.28</td>
<td>0.02</td>
<td>0.02</td>
<td>-0.72</td>
<td>-0.72</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>3.23</td>
<td>2.61</td>
<td>2.61</td>
<td>2.00</td>
<td>1.47</td>
<td>1.47</td>
<td>3.38</td>
<td>3.38</td>
</tr>
<tr>
<td>Observations</td>
<td>360</td>
<td>360</td>
<td>360</td>
<td>360</td>
<td>360</td>
<td>360</td>
<td>360</td>
<td>360</td>
</tr>
</tbody>
</table>

*Source: Authors’ calculation.*

Table 2 provides a statistical description of the panel data structure that is considered for econometric analysis. The log transformation was done to make the data normal and linear, and suitable for gravity analysis.
Table 3. Correlation matrix

<table>
<thead>
<tr>
<th></th>
<th>$X_{ijt}$</th>
<th>$Y_{it}$</th>
<th>$Y_{jt}$</th>
<th>$D_{ijt}$</th>
<th>$P_{it}$</th>
<th>$P_{jt}$</th>
<th>$E_{it}$</th>
<th>$E_{jt}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_{ijt}$</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$Y_{it}$</td>
<td>0.66</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$Y_{jt}$</td>
<td>0.57</td>
<td>0.12</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$D_{ijt}$</td>
<td>-0.13</td>
<td>-0.04</td>
<td>-0.04</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_{it}$</td>
<td>0.43</td>
<td>0.69</td>
<td>-0.15</td>
<td>-0.19</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$P_{jt}$</td>
<td>0.41</td>
<td>-0.15</td>
<td>0.69</td>
<td>-0.24</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$E_{it}$</td>
<td>-0.05</td>
<td>-0.18</td>
<td>0.09</td>
<td>0.33</td>
<td>-0.65</td>
<td>0.17</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>$E_{jt}$</td>
<td>-0.18</td>
<td>0.09</td>
<td>-0.18</td>
<td>0.33</td>
<td>0.16</td>
<td>-0.65</td>
<td>-0.17</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: Authors’ calculation.

Table 3 presents the correlation matrix of the gravity variables. It specifies the magnitude and direction of the relationship between the series. There is an inverse relationship between geographical distance and another variable that corresponds to the gravity theoretical framework. However, some other variables also show an adverse relationship which needs to be checked by panel analysis.

4. Empirical results and their discussion

In the course of the study, the gravity model was modified to take into account the population and globalisation index in the baseline gravity model. Initially, the gravity model was used by Tinbergen (1962) to study international trade relations. In 1979, Anderson provided a theoretical background to the gravity model and validated the use of the gravity model to study trade flows and direction between the countries. In 2001, Soloaga and Winters used the model for intra- and inter-trade analysis of an economic bloc.

Equation 2 is the baseline gravity model, and a log-log specification was considered to make the model linear (equation 3). Besides, the functional form of the modified gravity model is represented in equation 4. As a result, the augmented gravity is given in equation 5.

\[
X_{ij} = \frac{Y_i^\beta_i Y_j^\beta_j}{D_{ij}^\beta_{ij}}, \quad (2)
\]

Taking the log of the basic gravity model (2) to make the model linear, we get

\[
\ln X_{ij} = \alpha + \beta_1 \ln Y_i + \beta_2 \ln Y_j - \beta_3 \ln D_{ij} + \nu_{ij}; \quad (3)
\]

\[
X_{ij} = f(Y_i, Y_j, D_{ij}, P_{it}, P_{jt}, E_{it}, E_{jt}); \quad (4)
\]

\[
\ln X_{ij} = \alpha_i + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln D_{ij} + \beta_4 \ln P_{it} + \beta_5 \ln P_{jt} + \beta_6 \ln E_{it} + \beta_7 \ln E_{jt} + \nu_{ij}; \quad (5)
\]
Quantitative dynamics of intra-BRICS trade

Panel equation (5) comprise cross-sectional units such as trade between the BRICS countries in 2000–2017, where \( v_i \) is an error term, \( IID \sim N(0, \sigma^2) \) is implied, and the results of the panel estimation are shown in Table 4.

Table 4 presents four different estimation methods along with reliable and consistent results. Firstly, pooled OLS was used to establish a linear relationship with the diagnostic test. But it turned out that the pooled OLS method is unable to capture the heterogeneity effect of the panel data. Therefore, preliminary modelling is used to capture the unobserved effect of the panel data when the fixed effect model (FEM) estimates are analogous to the standard regression method. Intercept is considered in terms of cross-section units, but it doesn’t work for time-invariant cross-section unit variables. Distance is a time-invariant variable that is a vital component of the gravity estimate for the study. Therefore, a random effect model (REM) was adapted to collect distance information for analyzing bilateral trade. It is assumed that cross-section intercepts are random, not fixed. This helps to consider in this model a time-invariant variable that is omitted in the fixed effect model (FEM).

Additionally, the Hausman test was used to check which model was reliable and consistent among FEM and REM, whereas the Buresch-Pagan LM test was used to distinguish between the pooled OLS and FEM. However, it is denounced on the grounds that REM cannot identify a possible correlation between individual effects and explanatory variables (Mundlak, 1978). To minimize the relationship between \( V_i \) and other explanatory variables, the Hausman-Taylor model was proposed for REM. It examines the instrumental variables technique and the bidirectional relationship between trade and GDP of both exporting and importing countries. Hence, it has a significant role in the risk-averse policy-making process.

Table 4. Evaluation of the augmented gravity model of the BRICS countries (2000–2017)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pooled OLS</th>
<th>Fixed effect model</th>
<th>Random effect model</th>
<th>Hausman-Taylor estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>( C )</td>
<td>-38.91 (0.00)</td>
<td>-102.39 (0.00)</td>
<td>-41.37 (0.00)</td>
<td>-94.76 (0.00)</td>
</tr>
<tr>
<td>( Y_{it} )</td>
<td>0.48 (0.00)</td>
<td>0.44 (0.00)</td>
<td>0.66 (0.00)</td>
<td>0.53 (0.00)</td>
</tr>
<tr>
<td>( Y_{jt} )</td>
<td>0.66 (0.00)</td>
<td>0.66 (0.00)</td>
<td>0.66 (0.00)</td>
<td>0.63 (0.00)</td>
</tr>
<tr>
<td>( D_{ijt} )</td>
<td>-0.22 (0.06)</td>
<td>omitted</td>
<td>-0.16 (0.72)</td>
<td>-1.35 (0.50)</td>
</tr>
<tr>
<td>( P_{it} )</td>
<td>0.59 (0.00)</td>
<td>0.89 (0.22)</td>
<td>0.59 (0.00)</td>
<td>1.26 (0.01)</td>
</tr>
<tr>
<td>( P_{jt} )</td>
<td>0.52 (0.00)</td>
<td>3.79 (0.00)</td>
<td>0.58 (0.00)</td>
<td>2.30 (0.00)</td>
</tr>
<tr>
<td>( E_{it} )</td>
<td>1.75 (0.00)</td>
<td>0.42 (0.02)</td>
<td>0.45 (0.01)</td>
<td>0.46 (0.01)</td>
</tr>
<tr>
<td>( E_{jt} )</td>
<td>0.57 (0.10)</td>
<td>0.17 (0.37)</td>
<td>-0.04 (0.79)</td>
<td>0.06 (0.72)</td>
</tr>
<tr>
<td>( R^2: ) overall</td>
<td>0.77</td>
<td>0.37</td>
<td>0.81</td>
<td>0.37</td>
</tr>
<tr>
<td>( \text{within} )</td>
<td>0.82</td>
<td>0.72</td>
<td>0.40</td>
<td>0.75</td>
</tr>
<tr>
<td>( \text{between} )</td>
<td>0.75</td>
<td>0.75</td>
<td>0.40</td>
<td>0.75</td>
</tr>
</tbody>
</table>
Table 4. Continued

<table>
<thead>
<tr>
<th>Variables</th>
<th>Pooled OLS</th>
<th>Fixed effect model</th>
<th>Random effect model</th>
<th>Hausman-Taylor estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-statistic/Wald 2</td>
<td>174.12</td>
<td>(0.00)</td>
<td>260.44 (0.00)</td>
<td>1487.35 (0.00)</td>
</tr>
<tr>
<td>Hausman test</td>
<td></td>
<td></td>
<td>28.29 (0.00)</td>
<td></td>
</tr>
<tr>
<td>LM statistics</td>
<td>1575.76</td>
<td>(0.00)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The values in parenthesis are the p-values of the corresponding coefficients of parameters.

Source: Authors’ calculation.

Table 4 presents estimates of all possible models where the Hausman and LM tests support the model consistency among the pooled OLS, REM, and FEM for gravity estimation. The Hausman test is significant at the 1% level of significance, implying that FEM is a reliable and consistent estimate, whereas the LM test is also significant at the 1% significance level, implying that REM is an appropriate model for estimating gravity. At this stage, there is a need to opt for the Hausman-Taylor estimate to overcome the difficulties in both the RE and FE models. The estimator also takes into account the endogeneity effect in the model and provides a reliable and consistent result for the gravity estimation. Consequently, the Wald test signifies that there is an overall impact of all variables on the bilateral trade in the BRICS countries. It implies that these variables affect the scale and direction of trade between the BRICS countries.

Moreover, the Hausman-Taylor estimates confirm the basic gravity framework of international trade. This means that trade between BRICS is affected by the economic sizes of both exporting and importing countries, and the geographical distance between them is inversely proportionate to the trade flow between these countries. From the results obtained, it can be concluded that if there is an increase in GDP of exporting and importing countries, this will affect the trade flow by 0.53% and 0.63%, respectively, at the significance level of 1%. However, the geographical distance is negative and insignificant for bilateral trade between BRICS. This indicates that distance is in inverse relationship with the trade flows between the BRICS countries. This also means that they are not able to reduce trade costs, thus affecting trade activities among them. The distance study is irrelevant in the BRICS context as three BRICS countries are neighbouring countries and sufficiently capable of negotiating their trade deals.

On the contrary, the population of both trading countries indicates the market size of these countries. The result reveals that it has a significant impact at the 1% level of significance. This means that the population is highly elastic and its impact on the trade flows between BRICS is relatively big. This denotes that if there is a 1% increase in the size of exporting and importing markets, then exports will increase by 1.26% and 2.30%, respectively. This implicates that trade between countries is relatively dependent on the market size of both countries. It is established that the BRICS countries have a huge
population heterogeneity, and as a result, these differences create opportunities for intra-BRICS trade.

Similarly, the index of globalization has a positive influence on trade between the BRICS countries. This economic index is comprised of policies related to trade taxes and tariffs. It is found that the economic index of exporting countries has a significant impact at the 1% level of significance, whereas the economic index of importing countries has a minor impact on the trade flows of these countries. This means that both countries’ economic indexes are directly proportional to the trade flows of the BRICS countries. It follows that a change in the trade policy of exporting countries increases the direction of trade between the BRICS countries by 0.46%. However, the economic index of importing countries has an insignificant impact on the trade flows over the sample period.

Table 5. Residual diagnostic test of the panel model

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistics (p-value)</th>
<th>Results</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breusch-Pagan / Cook-Weisberg test</td>
<td>25.94 (0.00)*</td>
<td>Heteroscedastic</td>
<td>To make the series homoscedastic, vce robust will be used in estimation (2)</td>
</tr>
<tr>
<td>for heteroscedasticity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IM White’s test</td>
<td>147.69 (0.00)*</td>
<td>Heteroscedastic</td>
<td></td>
</tr>
<tr>
<td>Multicollinearity test</td>
<td>3.34 (mean VIF)</td>
<td>No multicollinearity</td>
<td></td>
</tr>
</tbody>
</table>

* indicates the 1% level of significance. p-values are given in brackets.

Source: Authors’ calculation.

Table 5 presents the residual diagnostic test of the panel model. The Breusch-Pagan and IM White’s tests were used to check the heteroscedasticity where it fails to reject the null hypothesis, i.e. model has a constant variance. Besides, there is no multicollinearity between the regressors since the average value of the VIF is below 10. This means that the model is fit for further estimation. Therefore, this parameter will provide a correct estimate of the gravity model. This implies that the modified gravity model is valid for the trade flow between the BRICS countries.

5. Summary of the empirical research

The literature survey reveals that trade between BRICS follows a combination of both the Linder hypothesis and the Heckscher-Ohlin trade model. According to the Linder hypothesis, countries with similar per capita income will trade homogenous commodities, while the Heckscher-Ohlin theory states that trade can occur between heterogeneous countries. In this research, the empirical results imply that trade between the BRICS countries plays a significant role in developing economic cooperation since the results of the gravity model show significant value. As far as trade is concerned, the BRICS countries follow the Heckscher-Ohlin trade model, because these countries are heterogeneous
and have different per capita incomes. In the Heckscher-Ohlin trade model, countries exchange not only products, but also factors of production. Therefore, it is evident from the empirical research that the BRICS countries have a heterogeneous set of economic, social, and political systems in which they create trade for economic cooperation. As for the distance, it is insignificant in the BRICS context, because India and Russia are the neighbours of China who is a major exporter in BRICS. Besides, BRICS economic policies play a significant role in promoting trade among themselves as they have to build strong economic cooperation to make an impact of the BRICS cooperation at the global level.

Conclusion

Economic development is the prime concern of every nation, regardless of whether it is developed or developing. Trade is one of the economic indicators that deals with the exchange of goods and services to reduce the disadvantages of countries. To strengthen international relations, countries create economic blocs for better economic cooperation. The study attempts to investigate trade components that directly or indirectly influence trade flows between the BRICS countries. The gravity model was used, and a reparameterization was done in order to modify the gravity model according to the objectives of the study. The empirical research confirms the basic gravity model, according to which economic size is directly proportionate to trade, whereas geographical distances are inversely proportionate to the trade flow between the BRICS countries. This implies that exports between the countries are highly influenced by the economic size. The countries participate in international trade, because they have substantial effective economic structures. They can produce goods and services to meet national and international demand for products. However, trade costs are one of the impediments to the trade flows between BRICS. The result reveals that it is insignificant during the period of study. It tends to provide information that BRICS are able to manage their trade cost incurred due to the geographical distance between the countries, and it is not more cumbersome for trade. This is an opportunity for the intra-BRICS trade flows. The market size of both exporting and importing countries has a direct influence on the scale and direction of trade between BRICS. The population size of exporting countries reflects national consumption, whereas the population size of importing countries reflects the market size of its trading partner. This means that the market size indicates demand for a product which is highly elastic in the context of the intra-BRICS trade flows. Similarly, trade policy also matter in international trade relations. It is reflected in the economic index which considers policies related to trade taxes and tariffs. In the context of the BRICS countries, exporting countries’ trade policies have a significant impact on the trade flows between them. This means that not only economic size and distance, but also market size and trade policies play a significant role in establishing strong trade relations between countries.

Policymakers should consider trade as an important component of sustainable economic cooperation between the BRICS countries. The study reveals that BRICS
have the potential to establish international trade among themselves. They have significant economic dimensions and market potentials for trade flows. They are able to manage trade costs, taxes, and tariffs, which contributes to the prosperity of the intra-BRICS trade flows. This means that gravity estimate contributes to establishing a risk-averse policy for the BRICS countries. As confirmed by the empirical evidence, they can manage their trade costs, which is difficult when trade takes place on different continents and countries are diverse in terms of economic, social, and political structure. Therefore, international trade will be a great initiative for the BRICS alliance in terms of economic cooperation and establishing strong relations in the economic bloc.

For further research, one should also consider other components of trade along with the gravity model of international trade. Theoretically, trade is an important economic indicator and depends on many economic factors. To obtain a more reliable, consistent and effective result of the empirical analysis of the gravity model, it would be more appropriate to take into account the economic, social, and political factors of the countries. This study can also be expanded to separately analyze bilateral trade flows between the BRICS countries and their trade with the rest of the world.

References


Appendix

Source: Calculated by the author with UNCTAD database.

**Figure 1.** Export between BRICS countries

Source: Calculated by the author with UNCTAD database.

**Figure 2.** GDP of exporting and importing of BRICS countries
**Figure 3.** Population size of exporting and importing of BRICS countries

**Figure 4.** Economic index of exporting and importing of BRICS countries

*Source:* Calculated by the author with UNCTAD database.
**Note:** Constant during the period because time invariant variable.

**Source:** Calculated by the author with UNCTAD database.

**Figure 5.** Geographical distance

**Source:** Calculated by the author with UNCTAD database.

**Figure 6.** Graph matrix of Gravity variables
Investment cooperation in the BRICS countries

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Reference to this paper should be made as follows: Sholokhova, M. (2020). Investment cooperation in the BRICS countries. *BRICS Journal of Economics, 1*(4), 24–32. [https://doi.org/10.38050/2712-7508-2020-1-4-3](https://doi.org/10.38050/2712-7508-2020-1-4-3)

Abstract

The purpose of the study is to analyze the current stage of investment cooperation between the BRICS countries in terms of current investment projects and legislation regulating investment interaction. The methods of the research are as follows: investigating the issue of investment cooperation between different member states and the legal framework for such cooperation; finding sources such as books, magazines, journals, legal acts, and websites; collecting all the necessary data; critical analysis of the data on the issue of the research; developing an outline. The investment interaction under study is presented at three different levels: outward foreign direct investments from the BRICS countries; foreign direct investments into the BRICS countries; and investment cooperation between the BRICS countries. All levels of investment cooperation are regulated both at the national and international levels.

Keywords: investments, BRICS, investment cooperation, foreign direct investments, BIT.

JEL: E22, P33.

Introduction

In the modern world, interaction with other countries, namely, active participation in international organizations, is of great importance for the development of any state. BRICS is an influential intergovernmental network whose purposes are not limited to agenda-setting, policy coordination, multilateral economic cooperation, and information exchange.

The BRICS countries are characterized by high regional influence and economic potential. They account for 27% of the entire territory and 43% of the world’s population, as well as 25% of the world’s GDP (China has 13% of the world’s nominal GDP, India — 5.5%, Russia — 3.7%, Brazil — 2.9%) (Shavina, 2018). The BRICS countries have been

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working together for more than a decade to strengthen trade and economic ties. One of the main areas of cooperation between the BRICS countries is strengthening investment cooperation between the members of the group.

An increase in investment inflows helps to achieve the major goals of BRICS, namely, fostering economic growth of the member countries and achieving a high level of quality of life by ensuring financial and social stability. The mutual desire of the BRICS countries to strengthen their relations on a developed legal and contractual basis is crucial for successful investment cooperation.

1. Investment flows and ongoing projects in the BRICS countries

The BRICS countries are active investors on the world arena. In 2016, their investments reached 222 million USD, which amounts to 15.3% of global investments (Gorshenkova & Dorokhova, 2018). Most of the BRICS countries' investments go to neighboring countries, developing countries, and the EU. These investments are aimed at finding new markets and establishing long-term economic relationships.

The BRICS countries together provide a massive part of the world’s infrastructure investment. Infrastructure is a key factor of economic prosperity of countries.

The New Development Bank and the Asian Infrastructure Investment Bank, two international financial institutions initiated by the BRICS countries, are primarily focused on supporting infrastructure investments. These institutions can strengthen the multilateral framework for addressing infrastructure development on a global scale, creating additional capacity to meet significant investment needs (Qureshi, 2017).

As representatives of rapidly developing economies, these countries are the driving force of economic growth. Moreover, they have economic stability, trade openness, good infrastructure, and a potentially huge consumer market. All these factors attract more and more foreign investors. Thus, in recent years, the BRICS countries experienced a rapidly increasing inflow of foreign direct investments.

Brazil, Russia, India, China and South Africa has become host states for foreign investors from all over the world. In 2016, the inflow of FDI to the BRICS countries reached 276 805 million USD (FDI to China amounted to 133 700 million USD; to Brazil — 58 680; to India — 44 486; to Russia — 37 668; and to South Africa — 2 270 million) (Gorshenkova & Dorokhova, 2018).

Within the framework of multilateral cooperation, the BRICS countries are implementing major energy, agriculture and environmental projects, as well as projects in the manufacturing and mining industry.

In 2019, the BRICS countries decided to launch a new international payment system, BRICS Pay.1 This system is expected to contribute to the stability of payments and investments in national currencies, accounting for more than 20% of the global

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1 BRICS Information portal. https://infobrics.org/
foreign direct investments inflow. In addition, the BRICS Business Council is discussing the creation of a single cryptocurrency for payments between countries.

However, the share of mutual investments remains relatively small. Russia has a high production, technological and scientific potential, yet, due to the economic and political situation in the world, it does not attract a large number of foreign investors. Despite this, China is actively investing in Russia. There are also Indian investments in Russia, which are mainly concentrated in mining, diamond processing, wholesale, textile industry, and pharmaceuticals. Since 2001, the largest Indian state-run Oil and Natural Gas Corporation (ONGC) has been participating in the oil and gas project Sakhalin-1 via its subsidiary ONGC Videsh Limited (OVL). It acquired a 20% share of this project. OVL is engaged in development and commercial production in Sakhalin together with the largest Russian oil and gas company Rosneft and other global companies, such as Exxon Mobil, and the Japanese company SODECO.

Apart from that, there are many other joint projects of Russian company Rosneft and Indian companies, including Taas-Yuryakh, the Vankor cluster (a consortium of Indian companies owns 49% in the Vankor cluster field), Far East LNG, Nayara Energy, and the Vostok Oil project. The goal of the Vostok Oil project is to establish a new oil and gas province in the North of Russia, in the Krasnoyarsk Territory, which has the advantage of being close to the Northern Sea Route. Moreover, in February 2020, Rosneft and Indian Oil Corporation Limited (IOCL) signed a contract to supply up to 2 million tons of oil to India via the port of Novorossiysk by the end of 2020.

One example of Russian investments in India is Sistema Shyam Teleservices Ltd (SSTL, MTS India). SSTL is an Indian mobile operator, a joint venture of the Russian AFK Sistema (73.71% of shares) and the Indian group of companies Shyam (23.79% of shares).

There is also a relatively active investment cooperation between Russia and South Africa. Russian industrial giant Renova, which specializes in manganese ore mining, manganese and ferroalloys production, and solar energy projects, operates its joint venture in South Africa. Besides, the Russian public limited liability company Severstal (production of briquetted iron) and the public joint-stock company KAMAZ (delivery of trucks and dump trucks, preparation for the assembly of vehicles) are operating in South Africa, too. The Russian company Rosgeologia and the South African state corporation Petro-ES have entered into an agreement on cooperation in the field of exploration and development of hydrocarbons on the Southern shelf of South Africa.

Several South African companies operate on the territory of Russia, namely, SAB-Miller (beer production), Mondi (cellulose production), Naspers (information technology),

Investment cooperation in the BRICS countries

Bateman (supplies of equipment and technologies for mining and metallurgical industries), Bell (heavy engineering), Standard Bank (financial services). The volume of accumulated Russian investments in South Africa is estimated at 1.5 billion USD. The volume of South African investment in Russia exceeds 5 billion USD.\(^6\)

Brazil is Russia’s largest trading partner in Latin America, yet the level of mutual investment between the countries is rather low. However, there are also examples of successful investment cooperation between the countries. Thus, the Russian company Biocad has opened a subsidiary in Brazil to implement a project aimed at organizing the production of modern highly effective medicines. In 2014, PJSC Uralkali acquired 25% of shares in the holding company Equiplan Participacoes S. A., the main shareholder of the marine cargo terminal Terminais Portuarios da Ponta do Felix in Antonina (Brazil). In 2012, PJSC KAMAZ and the Brazilian group of companies Marcopolo S.A created a joint venture for the production of buses, KAMAZ-Marko LLC in Neftekamsk, Bashkortostan. Serial production of Bravis buses started at the end of 2012.\(^7\)

2. China’s “going out” strategy

Due to China’s political and economic weight, this country’s role in mutual investments within the BRICS countries is the biggest. China is not only the second largest recipient of inward foreign direct investment, but also the third in terms of outward foreign direct investment (OFDI) (UNCTAD, 2013). Between 1978 and 1985, China opened its first special economic zones (SEZs) in the provinces of Guangdong (Shenzhen, Zhuhai, and Shantou), Fujian (Xiamen), and Hainan, which contributed to the establishment of BRICS (García, 2014). Later, China created economic and technological development zones (ETDZ), financial zones (FZ), new and high-tech industrial development zones (Touch), border economic cooperation zones (BECZ), and export processing zones (EPZ).

The growth of the Chinese OFDI began in the late 1990s with the adoption by the Chinese government of a strategy to expand China’s influence abroad (走出去战略) — the “going out” strategy. Over the past decade, thanks to this policy, China’s OFDI “has soared from almost nothing to more than USD 100 billion.”\(^8\)

In 2001, this strategy was embedded in the Tenth Five-Year Plan for national economy and social development and included in every subsequent plan (Deng, 2007). This strategy is a long-term plan to increase the number of Chinese investment in foreign countries by adopting special regulations. These regulations include, but are not limited to, a number

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\(^6\) Rossijsko-Yuzhnoafrikanskie otnosheniya (Russian — South African relations) https://russianembassyza.mid.ru/web/russianembassyza-ru/ekonomiceskoe-sotrudnicestvo

\(^7\) Ekonomicheskie otnosheniya Rossii i Brazilii. Dos’e (Economic relations between Russia and Brazil. Dossier) http://tass.ru/info/3331792

of incentives and benefits, such as tax rebates, investment insurances, direct and indirect subsidies, low interest loans, or export credits from financial sources, provided by Chinese policymakers. The “going out” strategy’s goal is to foster economy of China and intensify China’s influence abroad.

A growing volume of Chinese OFDI is favorable, in particular, for the BRICS countries. Foreign investments contribute to the economic growth of a country, as they help to develop certain regions, improve infrastructure, create more jobs, and attract more financial resources from abroad. Moreover, China is implementing its own initiatives, including the Belt and Road Initiative (BRI) and the Asian Infrastructure Investment Bank.

Russia and China have long and stable investment relationships. Currently, they actively cooperate via the international organizations they are members of and implement the Chinese Belt and Road Initiative.

One of the most important areas of investment cooperation between Russia and China is the oil and gas sector, since Russia has rich reserves of natural resources, and China is one of the largest importers of these resources. Currently, China and Russia are conducting many projects in the Arctic. Russia owns a major share in the extraction of Arctic resources. China wants to take a strong position in the Arctic and open up new possible trade routes across the Arctic. In 2018, China introduced its Arctic Policy, which establishes China’s desire to build a “Polar Silk Road” and “facilitate connectivity and sustainable economic and social development of the Arctic.” Sino-Russian projects in the Arctic are: the LNG 2 project in Northern Russia, the Yamal LNG project, the Payakha oilfield, the new deep-water port in Arkhangelsk, and the Zarubino port development project.

Apart from investing in the Arctic region, China has also undertaken other big projects on the Russian territory. For example, the Railway Construction Corporation (CRCC) is going to expand the Moscow metro network. The CRCC is to build a 4.6 km section and three stations on the Large Circle Line. The CRCC also committed to build another 6.4-kilometer line.

A significant part of investment cooperation between Russia and China is conducted via sovereign investment funds. In 2011, the Russian Direct Investment Fund (RDIF) and the Chinese Investment Corporation (CIC), each investing 1 billion US dollars, jointly founded the Russia-China Investment Fund (RCIF) to promote bilateral investment. The RCIF has undertaken many major investment projects. For example, the RCIF invested in the Russian Forest Products (RFP) group, the largest timber holding in the Russian Far East; in the Moscow Exchange, the largest exchange in Russia; and in DiDi, Chinese conglomerate providing transportation services.

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In 2019, the RCIF, together with Chinese investment bankers Suiyong Capital and Dazheng Investment Group, launched the China-Russia Regional RMB Fund in order to simplify investments in the Chinese and Russian currencies and contribute to the development of Siberia, the Russian Far East, and the North-East of China.

3. Legal framework of investment cooperation

Investment cooperation between countries is regulated both on the national and international levels. The interdependence of international and national legal regulation of foreign investments is based on the principles of the relationship between international and domestic law. The systems of international and national law are independent. However, they are closely related to each other and mutually influence each other. National legislation reflects national investment policy and helps attract investments from companies and individuals of the capital exporting state to the host state.

As for national legislation, each sovereign state has the right to regulate foreign direct investments. States can restrict investments in certain areas or, on the contrary, encourage investments in specific sectors. States can attract foreign investments by providing domestic incentive schemes, establishing economic processing zones, and opening investment promotion agencies.

In order to consolidate their relations on a contractual basis, countries conclude bilateral and/or multilateral treaties with each other. Such legal acts create the basis of trade, economic and investment cooperation between different countries, including the BRICS countries.

Investment treaties are the main sources of international investment law. Multilateral investment treaties (MITs) are concluded between two or more sovereign countries (MITs are mostly regional), while bilateral investment treaties (BITs) are concluded between two contracting sovereign countries. BITs establish terms and conditions for legal entities willing to make investments in another state. Investment treaties aim at providing a legal framework for qualified investors who want to contribute to the economy of the host state. Most importantly, they provide investors with guarantees against states that violate the principles of international investment law.

Modern MITs and BITs (including those ratified by the BRICS countries) contain necessary provisions on fair and equitable treatment of investments (FET), expropriation, and compensation for losses. FET is a central standard in international investment law. It establishes that the host-state treats investments made by investors of the other contracting party and activities related to such investments without abuse. Expropriation is a compulsory acquisition of an investor’s property by the host-state. Expropriation can be illegal or legal if certain requirements are met. In the event that the host-state breaches certain obligations under the BIT, it usually pays compensation to foreign investors for their losses or compensate them in another way. Many BITs establish that disputes between the host-state and foreign investors are settled amicably or/and via international arbitration.
4. Bilateral investment treaties concluded by the BRICS countries

At the international level, the BRICS countries have not reached a common opinion on how investment cooperation should be regulated, and there are no special investment agreements between them. The BRICS countries have different approaches to investor-state dispute settlement (ISDS) and to investment treaties (both bilateral and multilateral).

Brazil is known as a country that has signed many BITs, but has not ratified them. In 2015, Brazil launched its Model BIT, which is built upon an approach of investment cooperation rather than investment protection — something that a typical BIT entails (Ranjan, 2020). Moreover, Brazil is a party to several multilateral treaties and agreements containing investment provisions, including the existing India-MERCOSUR Framework Agreement.

By 2016, India entered into 82 BITs, of which 72 are in force. However, in recent years, India was trying to re-negotiate treaties with many countries. In 2016, India amended its model bilateral investment treaty (the Indian Model BIT). On January 25, 2020, India and Brazil signed an investment agreement — the India-Brazil BIT. This BIT is aimed at promoting investment and cooperation. The India-Brazil BIT is more focused on the Brazilian approach to investment treaties; however, it reflects the Indian approach as well.

South Africa started negotiating BITs in the early 1990s in order to promote and protect foreign investments. South Africa has a bilateral investment agreement with two other members of BRICS — Russia and China. The Russian Federation — South Africa BIT entered into force in 2000. The China — South Africa BIT entered into force in 1998. The South African model investment treaty applies the broad British model approach, meaning that protection provisions contained in the treaties include obligations to pay market value compensation in case of expropriation, national emergency, revolt, insurrection, riot, or other similar events in the territory of the other party. However, since the South African government is in the process of modernizing and improving the country’s investment regime, the basis of a new model investment treaty may change. In 2013, the South African government released a draft Promotion and Protection of Investment Bill.

China has a relatively large number of BITs, despite the fact that it only started concluding BITs in 1982. The reason for this is that since the Chinese economy is constantly growing, China is becoming an increasingly attractive destination for foreign investors,

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while investments of Chinese enterprises around the world are constantly rising. As of June 2013, China concluded 131 BITs (Berger, 2013). The China-South Africa BIT was concluded in 1997, the India-China BIT came into force in 2007.

The China-Russia BIT, or Agreement between the government of the Russian Federation and the government of the People’s Republic of China on the promotion and reciprocal protection of investments, was concluded in 2016. This important act regulates Sino-Russian investment cooperation. The China-Russia BIT aims at intensifying cooperation between the two states on the basis of equality and mutual benefits and creating favorable conditions and guarantees for investments by investors of one contracting party in the territory of the other contracting party. The India — Russian Federation BIT entered into force in 1996, but was unilaterally terminated in 2017.

5. Results and discussion

Having considered all of the above, we have come to the conclusion that other countries invest in the BRICS region as actively as the BRICS countries invest worldwide. Since the BRICS countries have huge economic potential, foreign investors are crucial for their development. At the moment, investment cooperation between the BRICS countries is generally limited. However, there are many bilateral projects between some of them. China is actively investing in these countries, implementing its national strategies of increasing OFDI, which raises the level of intra-BRICS investment cooperation.

Investment cooperation in the BRICS countries is regulated by national and international legislation. While national legislation reflects national investment policy, international investment treaties ratified by the BRICS countries reflect modern practices of protecting and encouraging foreign investors. The BRICS countries have developed different approaches to international investment treaties, but this does not preclude them from providing stable and fair legal framework for all foreign investors. Bilateral investment treaties concluded between the BRICS countries establish rights and obligations of foreign investors and the host-state. They also contain necessary provisions for fair and equitable treatment, expropriation, and compensation.

The BRICS counties do not have a multilateral investment treaty. It is presumed that the conclusion of such a treaty can have a positive impact on the BRICS investment cooperation since it will protect foreign investors from possible violations of their obligations by the host state. However, the BRICS countries cannot enter into a MIT unless they follow a similar approach when drafting their model investment treaties. Thus, the question of whether the BRICS countries should conclude MITs is still open.

Conclusions

There are large outflows of investments from the BRICS countries, as well as inflows of foreign investments to the BRICS countries. Since the BRICS countries become increasingly strong economically, such investments are expected to grow. However,
the level of investment cooperation between the BRICS countries is still relatively low. Despite the fact that the BRICS countries offer a stable legal framework for investors, there are not so many investment projects concluded between the countries. Notwithstanding this, the investment activity that is currently underway is going successfully. Bilateral investment treaties ratified by the countries make such investment cooperation possible and prosperous.

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Impact of a BRICS integrated payment system on cross-border e-commerce

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Abstract
This article examines what a BRICS integrated payment system can be and how it may affect the cross-border e-commerce dynamics. First, we show how the current international transaction system works, its geopolitical consequences and what a BRICS independent payment system implies. Second, we examine the current e-commerce scenario in BRICS, its main challenges, and what can be improved in it with the help of the proposed exclusive financial network. In conclusion, we review the current situation and make some necessary comments.

Keywords: BRICS Pay, cross-border, e-commerce, SWIFT.

JEL: L81, F52, F63, O19.

Introduction
The objective of this article is to better understand and analyze how a possible development of international payment platforms may affect the trade of the BRICS countries in the international arena. The motivation was to research the already known initiatives concerning greater independence of the BRICS bloc, such as BRICS Pay, and the possibility of an alternative to SWIFT transaction platform. After understanding how these initiatives can work and what they mean, the next step was to understand their impact on the digital trade between BRICS, what could be expected, and what should be considered a challenge. In this sense, the article is essentially a comment on how technological development of payments systems can affect the BRICS digital trade in the future.

The materials used during the research were mostly government declarations, international organizations’ reports (such as UNIDO and SASS), enterprise research, and some information from newspapers. The article is based on the analysis of these materials,

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identifying factors that were constantly mentioned as challenges to the development of financial sovereignty in BRICS, as well as individual problems of the e-commerce structure in each country of the bloc. Finally, after highlighting each of the most relevant obstacles in these areas, the idea was to comment on them, providing some insight into potential outcomes of investing in possible solutions.

1. Current operation of the international payment system

Before 1973, there were various problems related to international transactions, which were mainly carried out via Telex (an international transaction platform that predates SWIFT). The system had many problems with its communication speed and user safety due to its communication structure, which required sending lots of messages and check-ups only to complete a single transaction, not to mention the lack of unification in payment instructions (Scott & Zachariadis, 2012). These various factors motivated a group of six international banks to create SWIFT (Society for Worldwide Interbank Financial Telecommunication), the currently dominant payment mechanism.

SWIFT is both a system and a Belgium based company that relies on its top methods of security, payment monitoring, and standardization. It represents a significant improvement over Telex, as it uses a unique BIC code to identify each institution that enters the system, and uses FIN messages that narrow the financial order to just one message per payment. Even so, a factor that dictates its relevance is the international community’s adherence to this system, given that more than 200 countries and more than 11,000 institutions directly use the platform. An important characteristic of SWIFT to keep in mind is that it is a communication system, not a bank, so institutions exchange messages through it, not money (SWIFT Institute, 2020).

“Directly” is an important word in understanding the level of penetration of the platform since various transactions between smaller banks in different countries (which in this case aren’t members of SWIFT) are made in an “indirect” form, involving communication with larger banks. To better illustrate this dynamic, imagine four different banks (small bank A, large bank A, small bank B, and large bank B), and banks with the same letter are located in the same country. Small bank A wants to make a transfer to small bank B, and to do this, it has to establish a connection with large bank A for it to pass the message through SWIFT to large bank B so that it finally concludes the transfer to small bank B. The importance of understanding this process is to see how small banks depend on large banks for international transactions, and these latter, in turn, must be included in SWIFT so that they can execute payment orders. This represents the dynamic in which banks need a system to carry out their transactions, and SWIFT draws its importance from the number of direct and indirect users (SWIFT Institute, 2020).

Although SWIFT is currently being updated, being the most popular platform and getting new functionality, including improvements to the 2017 SWIFT gpi, its susceptibility to external influences creates a serious imbalance in the international payment dynamics. After threats of excluding Russia from the system during the 2014 Crimean crisis, it became a BRICS’s (and BRICS allies’) demand to develop mechanisms to reduce dependence on
the US dollar and institutions influenced by it, such as SWIFT. It is also worth mentioning that this scandal wasn’t the first to highlight dubious practices concerning the SWIFT system, for instance, the TFTP (Terrorist Finance Tracking Program) scandal in 2006, which affected EU countries (European Commission, 2007).

The idea of a functioning BRICS independent payment system would be very relevant for independent financial sovereignty. The implementation of this project could at least represent a safety measure against the pressure of the dominant United States and, at a maximum, become a channel for developing trade relations, including a related inter-BRICS trade project and, possibly, an alternative to the dollar currency.

BRICS currently accounts for about 42% of the world’s population and 18% of global trade (BRICS Brazil, 2019) and have the potential to change the world order in the coming decades. Although the creation of an independent payment system poses a lot of challenges, it is always useful to develop an understanding of the implications and possibilities of relevant events. Considering the context of a “digital economy” and a possible BRICS transaction network, the question arises as to how a new tool like this might affect the international trade scenario and, more specifically, how it might affect cross-border e-commerce trade rates and logistics.

2. E-commerce in BRICS and its importance for international trade

To discuss e-commerce, we first need to define what this term means and what its current economic importance is for BRICS. Taking into account various possible definitions of e-commerce, this article will define the concept as any transaction that is stimulated, assisted, or performed through an Internet platform. As for its importance in the BRICS context, we can pinpoint its potential to promote SMEs sales growth and better visualize more diverse markets, especially through the marketplace model (which reduces the costs of maintenance and marketing that are normally an obstacle to smaller businesses).

The potential that e-commerce marketplaces have for promoting sales and visibility of SMEs derives precisely from the way their models work, which have characteristics of what is called a “two sided market” (Eisenmann et al., 2006)). It’s important to note that e-commerce is not limited to the marketplace model, and not every marketplace works in the same manner. Essentially, the marketplace structure operates as an intermediary between buyers and sellers, functioning as a unified environment, in which these two parts can make a sale.

Factors that make a marketplace relevant are its ability to attract consumers to its platform and announce various products. The idea is to progressively construct a movement of enterprises entering the system that are normally looking for a cheaper and more efficient way to announce their products, as well as consumers who are looking for a single platform where they can easily encounter interesting products. That is precisely the value an e-commerce marketplace model can have in promoting international trade — it can unite consumers from various countries with sellers who would otherwise probably never reach these clients.
No matter how relevant the marketplace structure is, it is also important to take into account the macro-trend of digitalization and e-commerce in general. In recent years, we can see a growing trend in digital trade. Based on the latest reports from UNCTAD, we should notice that: “UNCTAD estimates that 1.45 billion people, or one quarter of the world’s population aged 15 and older, made purchases online in 2018... This is 9% higher than in 2017” (UNCTAD, 2020). And perhaps even more important: “The share of cross-border online shoppers to all online shoppers rose from 17% in 2016 to 23% in 2018” (UNCTAD, 2020), demonstrating not only the growth of digital commerce, but the trend of cross-border purchases as well.

Finally, the social impact of e-commerce on underdeveloped areas of the BRICS countries should not be taken for granted, and initiatives such as China’s rural e-commerce (Ali Research, 2017) demonstration project and eNam (Digital India and Ministry of Electronics and Information Technology (2019)) in India, serve as proof of this. These are two actual examples of investments aimed at fighting poverty and obtaining information in the agricultural market that show how e-commerce can be a unique integration tool.

Although e-commerce has great potential for the promotion of international trade, there are various problems that are common for the e-commerce scenario in the BRICS countries. Three of the most illustrative challenges are the legal perspective, the international trade logistics, and cultural specificities that always influence and complicate the first two challenges.

The first of these problems is the lack of specific laws concerning the regulation of e-commerce. With the possible exception of China’s numerous legal programs and, more specifically, India’s recent Draft National e-Commerce Policy (Department for Promotion of Industry and Internal Trade, 2019), the legislation of the three remaining countries still lacks specificity or maturity. This problem not only leads to new enterprises’ uncertainty in entering the e-commerce model, but also contributes to the existing lack of trust in online shopping and payment, which in turn affects the process of digitalization.

As an example, we can picture a brick-and-mortar store that is considering entering an e-commerce model. It will probably end up participating in a larger company’s marketplace, or maybe create its own sales website. If there is no clear regulation that defines what type of agreement is or is not legal to be made with this large company or even what information should be provided on a sales website, the trend in the long run is to create lots of standardization inconsistencies that cause the consumer to distrust the model.

Second, there is the logistics problem, which is a two-sided problem. One side of the problem is the internal infrastructure of the BRICS countries, which in some cases is underdeveloped, creating obstacles for enterprises to do business with the country. And the other side is associated with international export logistics, bureaucracy and lack of knowledge of the players. The first side can be worked out with the help of the NDB, given its focus on infrastructure investments; the second side is a bit more complicated.

A large part of the problem with international logistics is the number of bureaucratic procedures and taxes that must be paid, considering also different fees that can vary depending on the country to which the product is exported. These numerous procedures may discourage new players from entering a cross-border e-commerce market. With this
problem in mind, some Chinese markets came up with solutions, such as offering third-party services to meet international export standards and, more specifically, Alibaba’s Electronic World Trade Platform initiative. In essence, this is the creation of consulting centers in the BRICS+ countries (currently present in Malaysia, Rwanda, Belgium, and Ethiopia) to promote cross-border e-commerce practices (Electronic World Trade Platform, 2020).

Finally, as an example of cultural perspective, it is worth mentioning the lack of trust in digital payments among Russians, which makes cash on delivery the main transaction method in Russia, accounting for about 80% of all transactions and generating a more complex logistic scenario for e-commerce (Ecommerce News Europe, 2019). Another example is the gender gap in mobile device usage in India. It is reported that “women are now 20% less likely than men to use mobile Internet” (GSMA, 2020). This creates an obstacle to digital integration in India and, consequentially, to e-commerce.

3. Possible solutions and comments

The final solution that needs to be disclosed for a full understanding of the BRICS financial scenario is BRICS Pay. Essentially, this is a project to create a mobile app for better integration of businesses in the BRICS countries, which promotes the use of national currencies of participants as an alternative to the dollar (even the use of a unique BRICS cryptocurrency that would combine payment means into a single form was considered). Regardless of how the BRICS Pay initiative would work, promoting cross-border e-commerce could be an opportunity for every country in the bloc.

To emphasize the importance of alternative payment capacity for creating consumers habits in the e-commerce model, it’s useful to briefly point out and discuss some of its characteristics and definitions. In this paper, alternative payment systems should be defined as: “...a way of paying for goods or services which are not made via cash or major card schemes (Visa, MasterCard, American Express). This includes prepaid cards, mobile payments, e-wallets, bank transfers, and ‘buy now, pay later’ instant financing” (Banking Circle, 2019). Normally, these types of systems have their own value based on the customer’s experience in using the service, guaranteeing simpler, scalable, and unified solutions, which makes the process of paying for a product or service much easier. The general idea is to minimize the possibility of a client not buying a product due to the lack of payment options in the digital platform, as well as to create a trustful and understandable way to transfer money online.

Analyzing the issues raised in the two previous parts of the article, one can understand that these two topics complement each other. The independent SWIFT transaction system and possibly BRICS Pay will become a form of communication between countries, essentially, a foreign policy measure that can be used as a basis for further economic relations. As for the e-commerce part, the situation is somewhat different since e-commerce can work perfectly at the national “internal” level but shows its true potential to stimulate trade at the cross-border level.
Thus, it is clear that the link between e-commerce and financial protection mechanisms can function better together. The independent SWIFT payment system can be an environment for secure trade, and BRICS Pay can promote a unique alternative form of payment, luring consumers and businesses to participate in inter-BRICS international trade. Of course, these exchanges will be carried out through e-commerce, which is a cheap way of advertising small businesses internationally and providing easy access to products for customers. This also creates a collaborative way for enterprises to grow with the bloc.

An example of how national security measures and cross-border e-commerce are intertwined is the abovementioned Indian Draft National e-Commerce Policy. Specifically, there is a part that refers to FDI and its restrictions: “The policy aims to invite and encourage foreign investment in the ‘marketplace’ model alone. An e-commerce platform, in which foreign investment has been made, therefore, cannot exercise ownership or control over the inventory sold on its platform. In this manner, foreign investment is not seen as a threat by small offline retailers of multi-branded products” (Department for Promotion of Industry and Internal Trade, 2019).

Other issues that are relevant to comment on are the prevalence of SWIFT, the diverse e-commerce situation in each country, and various international pressures. Bearing in mind what the BRICS countries currently can and cannot do, there will be some comments on these issues.

Let’s start with SWIFT and pay attention to some important factors. The positive aspects for SWIFT are its accession to the international payment system and its current development (such as SWIFT-gpi). The negative aspects that a BRICS payment system could benefit from are its vulnerability to external factors, such as pressure from the United States, the fact that it is a message system (not a proper payments system), and fees associated with communication between banks. Perhaps a good advantage of creating a separate transactions network, given that it will be state sponsored, will be better control over both the external influences and the technical structure of the platform.

Following the e-commerce challenge, given the different scenarios in each country and its unique stage of digital development, is probably the best alternative in promoting international agreements. An example of how this can become more complex is the current problem in b2b and b2c e-commerce exposed by Hongfei Yue et al.: “In the traditional B2B trade mode, the single insurance policy is huge and only one kind of commodity is traded. It is efficient since customs clearance products are in bulk. However, for the cross-border e-commerce B2C model, the individual demand of buyers is strong, single orders are small and the cross-border trade is especially fragmented. If the ‘one by one in and out’ model is taken as the major model for customs clearance, batch checks are not possible. This greatly increases the number of customs clearance inspections and work. Therefore, the ‘one by one in and out’ model cannot meet the rapidly rising demand of clearance” (Yue et al., 2017).

It is also necessary to consider the above-mentioned “macro” implications of establishing an international system alternative to SWIFT. Due to the already mentioned level of use of SWIFT, the process of implementing an alternative system will not stop
its use; the most likely possibility is that we will get a competitive scenario. The specifics of such a situation are not entirely predictable, but there are some characteristics that are more probable. First, the system is likely to start working only within BRICS, but it is important to plan for adding more members (possibly related to the BRICS Plus initiative), avoiding creating an isolated system, which would be bad for BRICS. With this in mind, the turning point will be to create a “mass” connection to this new system, similar to what SWIFT already has.

This level of commitment could be attempted by creating a structure better adapted to the needs of banks, and reaching out to countries suffering from dollarization of economy could also be a strategy for bringing new players into the system. Assuming that it has gained considerable relevance, this would lead to another possible specific point in which the alternative BRICS system could effectively compete with SWIFT to attract more countries to it. There is also a possibility of cooperation among this new system and SWIFT; and this last case may occur if the alternative system is already developed and has a niche to position itself in the international “market” of transactions.

Another problem that should be noted is the lack of a single statistical center for e-commerce development since various data can only be obtained by buying them from big consulting companies. With the creation of a single system such as BRICS Pay, cross-border trade information could be organized to better formulate new e-commerce and academic research policies.

Finally, it is important to consider not only the pressure that external countries still exert on international institutions, but also the importance of foreign e-commerce companies and what they can do in national markets. Even with these various challenges, it is always useful to think about what policies can be created and what opportunities we have to promote the growth of our nations.

4. Results and discussion

The importance of discussing the BRICS situation in the context of international financial sovereignty and its development in digital trade is largely related to two bigger factors — the emergence of the BRICS countries and the process of digitalization taking place all over the world, respectively.

First, as for the growing influence of BRICS. As mentioned earlier, these countries take part in a very significant segment of international trade, and their policies have considerable impact on the world. Given this and the growing influence of this bloc, it is possible to justify why it is so important to discuss possible initiatives that could change the international payments structure.

Second, about the process of digitalization and why the discussion of digital trade is so important. Currently, the world is in the process of digitalization not only in payment systems and trade, but also in all sectors of the economy and society. The reason this article focuses on e-commerce specifically and not on trade in general is that these two things are becoming more and more inseparable (taking into account the definition of e-commerce
used in this article). With this in mind, the objective was not only to perceive how the development of a new digital platform could increase transactions between countries, but how a digital platform could (through an integrated system) possibly affect the way countries trade using digital commerce.

Finally, the results of the research can be summarized in the diagnosis of the BRICS situation concerning financial sovereignty and the development of digital trade, which, considering its growing projection on the international arena, still has a great unexplored potential. The results can be divided into the abovementioned two topics that were explored throughout the article in order to objectively define the findings of the study.

**Conclusion**

The major factor that was considered in this article as the problem of financial sovereignty of the BRICS bloc is the very existence of SWIFT. The conclusion that can be drawn after understanding what this system is and how it is affected by the pressure on the part of the United States is that it can pose a serious threat in terms of international sanctions. The system has its strength based on the adherence of countries and banks all over the world, and this is probably the biggest challenge for any opposing initiative. The potential of the BRICS countries to counter this is to create an alternative structure of payments messages, as already discussed, and possibly to create a channel for further promoting de-dollarization and establishing a reliable project such as BRICS Pay.

There are lots of factors that make e-commerce between the BRICS countries very difficult to develop, including the lack of international regulation of e-commerce (at least between the BRICS countries), as well as cultural factors that further complicate transactions and force enterprises to adapt to diverse situations. The problem of e-commerce in BRICS can be defined as a challenge to integration and standardization, and adjusting the foreign policy of each BRICS country to the unique pace of development of each part of the bloc seems to be at least an important part of this challenge.

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Comparison of approaches to legal regulation of e-commerce in the BRICS countries

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Abstract
The article examines the importance of e-commerce in the modern world, as well as the level of its development and legal regulation in the BRICS countries. The author studied the problems of functioning of international electronic commerce during the 2020 coronavirus pandemic. For the purpose of comparative legal research, the legislation on electronic commerce of the Russian Federation, the People’s Republic of China, Brazil, India, and the Republic of South Africa was considered. In the course of the study, it was concluded that the existence of a single normative act regulating exclusively legal relations within the framework of electronic commerce was the most effective way of legal regulation in this area.

Keywords: legislation, pandemic, BRICS countries, e-commerce, Internet trade.

JEL: L81.

Introduction

E-commerce using the Internet is an integral part of society today. This fact is confirmed by statistical studies, according to which 40% of Internet users worldwide buy goods or services using online platforms.¹ This area of activity is especially relevant for the BRICS countries, given that China, India, and South Africa are the fastest growing markets among the BRICS countries.² In other countries, e-commerce development indicators are unstable, so the BRICS countries need to consolidate in this area.

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The need for consolidation is also confirmed by the fact that the largest digital platforms are global. This raises the question of developing uniform approaches to antimonopoly regulation of their activities recognized by the world community. In addition, since digital platforms extend their reach to cross-border markets, the existence of different approaches to the activities of such digital giants in individual states will significantly reduce the effectiveness of regulatory impact (Spiridonova, 2020).

The paper uses a comparative legal method for studying and comparing the legislation in the BRICS countries. Another method used in the research is the analysis method allowing to identify the rules governing electronic commerce in the BRICS countries.

1. Impact of the pandemic on the development of e-commerce

The Russian Federation has been developing electronic commerce since 2003. This is confirmed by the report “Some aspects of the development of electronic commerce in Russia,” which at the time of its creation contained information only about online stores. Of course, today Russian consumers use not only online stores, but also online aggregators, the largest of which are Ozon, Wildberries, Ulmart, YandexMarket, Lamoda, etc.

The pandemic has triggered the growth of e-commerce, as restrictive measures have become an obstacle for people to shop offline. Thus, according to the Russian National Association of Distance Selling (NADT), during the pandemic, 7 million new buyers came to Russian marketplaces. However, restrictive measures have also revealed some problematic aspects of this area.

First, the 2020 coronavirus pandemic highlights the problem that e-commerce is less effective if it develops only within the borders of one country. Secondly, the legislator was faced with the issue of consumer protection in electronic commerce (Gromova & Ivanc, 2020). For example, how can consumers find out who exactly they conclude a transaction with; whether the site is a seller or acts only as an information intermediary; who should complaints be sent to in case of violation of rights. Thirdly, there is the issue of competition between the largest aggregators, whose popularity is so high that other sites are in the shadow of their competitors; the problem also manifests itself in the fact that some aggregators have been specializing in online sales for many years, and representatives of small and medium-sized businesses are forced to create online platforms from scratch or use services of competitors at a high price due to the pandemics.

Despite the fact that the coronavirus pandemic has had a stimulating effect on the development of e-commerce, including transnational, thanks to it, at the same time, the problem of insufficient legal regulation of this area has become more acute, both in individual BRICS countries and within the entire association. Only one country in the

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union (China) has a separate law dedicated entirely to e-commerce. Other countries have a number of separate rules that are scattered in different regulations or apply traditional consumer protection laws to e-commerce relations.

To identify gaps in the legislation on e-commerce regulation, we consider it necessary to conduct a comparative analysis of the legislations of the BRICS countries devoted to regulation of this area.

2. Russia

Consider the Law of the Russian Federation “On Protection of Consumer Rights” (hereinafter — the Law). The development of electronic commerce was the reason for introducing novelties into it. So, in 2018, the Law introduced the concept of an owner of an aggregator of information about goods (services): “An organization, regardless of its organizational and legal form, or an individual entrepreneur who owns the program for electronic computers and (or) the owners of the site and (or) the page of the site in the information and telecommunication network ‘Internet’ and which provide the consumer with respect to a certain product (service) the opportunity to simultaneously familiarize himself with the proposal of the seller (executor) to conclude a contract for the sale of goods (contract for the provision of services)...”

Paragraph 1.2 of Article 9 of the Law determines the list of information that the aggregator must provide to the consumer. Article 12 of the Law establishes the responsibility of the aggregator for providing inappropriate information about the product to the consumer. Article 26.1 of the said Law specifies rules for distance sale of goods, for example, the seller must provide the consumer with information on the main consumer properties of goods, delivery rules, and rules for returning goods before concluding a contract.

Let’s give an example from judicial practice. The plaintiff bought a mobile phone on the AliExpress website on the basis of an invoice dated November 13, 2017. The funds were transferred to the seller’s account, which was confirmed by a bank statement. The goods were tracked by the track number of the parcel, from which it follows that the parcel arrived on the territory of the Russian Federation on 2017.11.26. On November 27, 2017, the package was released by customs. Further movement of the parcel on the site was not tracked. Prior to the trial, the claimant’s package was never received. An answer was received to the seller’s address, according to which the seller was not responsible for the goods that had passed the customs of the Russian Federation. Also, the plaintiff addressed the defendant (Federal State Unitary Enterprise “Russian Post”) with the claims dated 2018.03.04 and 2018.04.16, in response to which it was reported that since there was no information about the processing and forwarding of the postal item, it was considered lost. On the basis of Article 13 of the Law on the Protection of Consumer Rights, as well as the norms of the Civil Code of the Russian Federation, as well as the norms of the Universal

Postal Convention, the court satisfied the plaintiff’s claims. But this decision is a precedent, firstly, because the victims do not always go to court, and secondly, the plaintiff was able to correctly prove the fact of the purchase, the fact of moving the goods, etc.\(^5\)

It should be noted that the Russian Federation adopted the Resolution No. 24 of the Plenum of the Supreme Court of the Russian Federation “On the Application of Rules of International Private Law by the Courts of the Russian Federation” dated July 09, 2019. In this Resolution, the Supreme Court of the Russian Federation clarified that in such situations, it is possible to apply the norms of the Russian legislation on consumer protection. According to the explanations of the Plenum of the Supreme Court of the Russian Federation, a website on the Internet can be considered targeted at Russian consumers if one of its languages is Russian, prices are in Russian rubles, contact phone numbers with Russian codes are indicated, or there is other similar evidence (for example, the website owner ordered services aimed at increasing the citation rate of his site among Russian Internet users).\(^6\)

Now we will consider the Resolution No. 612 of the Government of the Russian Federation “On Approval of the Rules for the Sale of Goods by Remote Method” dated September 27, 2007 (hereinafter referred to as the Resolution), the key aspect of which is the concept of selling goods remotely: “Sale of goods under a retail sale and purchase agreement concluded on the basis of familiarization of the buyer with the description of the goods proposed by the seller contained in catalogs, brochures, booklets or presented in photographs or using postal networks, telecommunication networks, including the information and telecommunication network ‘Internet’...”\(^7\) Also, in this Resolution, the concept of a seller was modified: “An organization, regardless of its organizational and legal form, as well as an individual entrepreneur selling goods remotely.”

The above-mentioned regulation specifies types of goods that are prohibited from being sold remotely, such as alcoholic beverages and products that require certification for sale, such as jewelry. It also establishes the rules of transfer, delivery, rejection of goods, terms and necessary documents, and consumer rights when selling goods of inadequate quality.

The question arises about the effectiveness of such norms. In the concept of “selling goods by remote means,” the Russian legislator equated selling via the Internet with selling via mail, radio, and TV channels. As a consequence, the norms reflected in the Resolution are designed for all these types of trade. However, when disputes arise in practice, application of these rules will be ineffective. The definition of the owner of the

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\(^5\) Decision of the Odintsovo City Court of the Moscow Region No. 2-5046 / 2018 of July 20, 2018 in case No. 2-5046 / 2018 https://sudact.ru/


aggregator is also not entirely correct. For example, Rozhkova believes that the “owner of the aggregator” is actually the copyright holder of the corresponding technological platform, which includes, in particular, computer programs, databases, the website itself, and other things (Rozhkova, 2018).

In 2000, a Draft Federal Law “On Electronic Commerce” was submitted to the State Duma of the Russian Federation. It disclosed the concept of electronic commerce: “...the conclusion, through the exchange of electronic documents, of the following transactions stipulated by the Civil Code of the Russian Federation (but not limited to them): purchase and sale, delivery, paid services, transportation, loan and credit, etc.” Since the bill was submitted to the State Duma of the Russian Federation in 2000, therefore, the content of the bill does not mention the concept of the Internet, and electronic commerce is reduced to the exchange of documents in electronic form. Also, this draft law defines the concept of an information intermediary: “...a person who, on behalf of another person, sends, receives or stores electronic documents or provides other services in relation to these documents.” Also, this definition does not in any way correspond to the concept of an aggregator or copyright holder of the site. The term “information system” is defined in the project as: “a system for preparing, sending, receiving, storing or otherwise processing electronic documents.” Today this information system is called a database. Further, the bill contains provisions on natural monopolies. Thus, the above draft law is outdated, and the understanding of e-commerce as in the early 2000s is no longer relevant.

3. China

Now let’s turn to the legislation of China. In 2018, the Law of the People’s Republic of China “On Electronic Commerce” (hereinafter – the PRC Law) was adopted, which discloses the concept of “electronic commerce”: “Commercial activities for the sale of goods or the provision of services via the Internet and other information networks.” Chinese lawmakers emphasize that e-commerce is directly linked to the Internet and information networks. Instead of the term “aggregator,” the PRC legislator uses the term “e-commerce operator,” which refers to individuals, legal entities and unincorporated organizations that carry out commercial activities provided by a supplier, including operators of e-commerce platforms, as well as station operators and e-commerce operators who sell goods or provide services through self-created websites and other network services.9

Consumer safety is ensured by Article 17 of the above Law. Electronic commerce operators must disclose information about goods or services in a comprehensive, truthful, accurate, and timely manner. E-commerce operators should not use bogus transactions, fabricate user reviews, or conduct false or misleading commercial propaganda in a manner

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that deceives and misleads consumers. This rule is relevant since in e-commerce it is very easy to mislead the consumer by publishing false reviews.

Paragraph 2 of Article 24 of the PRC Law obliges the operator to control the dissemination of information about the user. “When an e-commerce operator receives an application to request information about a user, correct or delete, he must verify the identity. Promptly submit inquiries, correct or delete user information. If the user logs out, the e-commerce operator must immediately delete the user’s information…” This rule is important for the consumer, since protection of personal data is in his best interests. In addition, Article 30 of the PRC Law obliges operators of e-commerce platforms to take technical measures and other necessary measures to ensure the security of their network. Operators are also required to ensure full and stable operation, prevent illegal and criminal activities on the network, effectively respond to network security incidents, and protect e-commerce transactions. This creates an additional guarantee of data security.

To minimize cases when an individual creates a website for selling goods, while using the word “store” or “company” in its name, the PRC legislator established a rule according to which operators of an e-commerce platform must require an application to be included in the platform for selling goods or providing services. Business operators, i.e. persons who directly trade, provide their real information, such as identity, address, contact information, administrative license, etc. To verify registration, it is necessary to regularly check and update the registration files.

Any trade is related to intellectual property; therefore, protection of intellectual property rights is also a responsibility of the operators. Under Articles 41 and 42 of the PRC Law, e-commerce platform operators establish rules for the protection of intellectual property rights. If the owner of the intellectual property rights believes that his intellectual property was infringed, he has the right to notify the e-commerce platform. Operators in Taiwan take necessary measures such as deleting, blocking, disconnecting, and terminating transactions and services. The notification must contain evidence of a violation. Upon receipt of the notification, the e-commerce platform operator must take necessary and timely measures and send a notification to the platform.

Now let’s turn to Articles 49, 50, 51 of the PRC Law. They prescribe how the user interacts with the e-commerce operator.

**Step 1.** If the information about the product or service provided by the e-commerce operator meets the terms of the offer, the user selects the product.

**Step 2.** If the product or service is selected and the order is successfully sent, the contract is concluded. A special point is that e-commerce operators should not use standard clauses or other methods to stipulate that the contract will not be concluded after the buyer has paid the price.

**Step 3.** The e-commerce operator must comprehensively and clearly inform the user about steps, precautions, delivery methods, etc. The operator must also ensure that users can conveniently and completely read and download information about the goods.

**Step 4.** After the electronic payment service providers complete electronic payments, they must provide users with timely and accurate information confirming the payment in the agreed way.
Chapter IV of the PRC Law regulates the procedure for resolving disputes in e-commerce. To improve user-operator interaction, the latter should create a convenient and effective mechanism for filing complaints and messages, as well as publish complaints and reports.

Disputes related to e-commerce can be resolved in several ways. First, it can be done through negotiations and inquiries from consumer organizations, industry associations, or others organizations. The main principle of interaction between operators and consumers is that in the event of disputes, operators of e-commerce platforms should actively help consumers to protect their legal rights and interests. The second way is judicial. When resolving disputes related to e-commerce, e-commerce operators must provide original contracts and transactions. Due to loss, counterfeiting, destruction, concealment or refusal to provide the aforementioned information by the e-commerce operator, if the people’s court, arbitration institution or the relevant institution cannot establish the facts, the e-commerce operator is legally responsible.

The third way to resolve disputes is voluntary, through online negotiations. Operators of e-commerce platforms can create online dispute resolution mechanisms, formulate and publicize disputes.

The state of the PRC does not shirk from developing e-commerce. According to article 67 of the above law, the state promotes the use of e-commerce in various areas of the national economy, as well as supports industrial integration and development. And according to article 66, the state contributes to the creation of e-commerce infrastructure and logistics network, and also improves the statistical system of e-commerce.

Anyone who violates the provisions of the PRC Law “On Electronic Commerce,” therefore, infringes on the management of public security and should be punished in accordance with the law, and if the act contains elements of a crime, then the offender will be held criminally liable.

The problem in China today is that there are many retailers who do not take advantage of their social, mobile networks in developing e-commerce. For example, a PwC Total Retail 2017 study shows that 70% of Chinese shoppers believe personalized marketing is important to their overall shopping experience, and only 50% are currently satisfied with modern personalized marketing. Historically, big brands have distanced themselves from the buyer by only having access to basic demographic data. Secondly, for a long time, fake accounts operated on social networks, which caused distrust among buyers. At the same time, experience has proven the effectiveness of social networks in the development of e-commerce.10

Thus, the legislation of China is focused on the development of electronic commerce. At the moment, the law of the PRC “On Electronic Commerce” is the most progressive among the BRICS countries. Evidence of this success is the volume of e-commerce. For example, in 2016, the volume of the B2C (business-to-consumer) e-market segment in Russia amounted to $12 billion, and in China – to $400 billion. The Chinese economy was focused on e-commerce, so the legal regulation of this area was the main task of the Chinese legislator.

Over the past decade, Russia has also begun to rapidly expand e-commerce. For example, in 2016, the volume of the Russian e-commerce market was 260 billion rubles, and in 2017, it reached 1,150 billion rubles. At first glance, this is a large figure, but if we compare it with the total volume of retail sales in Russia, it is only 3.5%.\(^{11}\)

In general, the development of all economic relations between the RF and the PRC is based on the growth of e-commerce, while the consumer base in Russia is more than 90% of the population.\(^{12}\)

### 4. Brazil

Now let’s turn to the Brazilian e-commerce legislation. This country does not have a specific law on e-commerce, as China does. The basic law is the “Brazilian Consumer Protection Code,”\(^{13}\) which regulates commercial legal relations, regardless of the way they are carried out. This law contains only general rules, such as the consumer’s right to adequate and clear information about various products and services with the correct indication of the quantity, characteristics, composition, quality, price and taxes, as well as possible risks. The consumer has the right to be protected from misleading and offensive advertising, commercial methods based on coercion or other illegal means, as well as from actions and reasons that are offensive or imposed as part of the supplied products and services. The above provisions also apply to legal relations in the field of electronic commerce. Law No. 13.543 of December 19, 2017 “On Offers and Methods of Displaying Prices for Products and Services for the Consumer” is considered a very important law, since at the legislative level it sets the font size for prices in electronic commerce, which must be at least twelve points for perception convenience.\(^{14}\)

In addition, the provisions of the draft law “Brazilian Civil Internet Base” will apply to legal relations in electronic commerce, as well as the rules on the protection of personal data on the Internet.\(^{15}\) Data collection is only possible with the prior consent of users. Users will be required to explicitly consent to the collection of information about their browsing habits. However, in some situations, they may not consider it possible to continue using the service if they decide not to accept the terms set by the site. Article 16 of the said bill establishes a direct prohibition on storing access to logs of other Internet

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applications without the prior consent of the data owner, taking into account the provisions of Article 7 or personal data that is excessive in relation to the purpose for which the owner has given his permission. The provisions of Article 11 are of particular interest, because this may directly affect international electronic commerce: “In any operation for the collection, storage, and processing of records, personal data or messages via the connection and the Internet of application providers in which at least one of these actions take place on national territory, Brazilian law and the rights to privacy, personal data protection and the confidentiality of personal messages and records must be respected.”

But in 2013, the Decree of the President of the Republic of Brazil of March 15, 2013 No. 7962 on electronic commerce was adopted.\(^\text{16}\) For example, Article 2 of this Decree states that the seller’s electronic website must contain: postal address and email, and other information necessary for its identification; the main characteristics of the product or service, including risks to the health and safety of consumers; terms of price, any additional or ancillary costs such as delivery or insurance; availability; form and timing of the service or product delivery or release. All these conditions must be displayed in a visible, easy-to-view place on the site. The sites must also contain information about the minimum number of consumers for the contract to enter into force, the term of use of the consumer’s proposal, and the code of the supplier responsible for the site about the electronic supplier of the offered product or service.

Article 5 of this Decree contains conditions obliging the supplier to clearly and openly inform about the means that are effective for the implementation of consumer protection.

In Brazil, there is a long history of controversy over advertising on websites that misleads consumers. Therefore, this Decree also contains rules that ensure compliance with the 1990 Consumer Protection Code for out-of-office contracts and establish minimum requirements for such information.\(^\text{17}\)

Thus, Brazilian legislation contains a number of regulations that extend to legal relationships in electronic commerce, but only one Presidential Decree contains a small list of special rules aimed at regulating electronic commerce, which is not always effective, because the Decree consisting of 9 articles cannot settle all types of legal relationships in the field of electronic commerce. Judicial practice draws attention to the consumer’s right to information about the manufacturer and seller, and private information exchange services are under development (Ostanina & Titova, 2020).

5. India

The Republic of India is also engaged in the development of electronic commerce. This thesis is confirmed by the fact that India has been declaring its participation in electronic commerce since 1997. In 2017, e-commerce turnover was projected to grow from


$30 billion in 2017 to $86 billion in 2022. This is facilitated by the development of the online platform IndiaMart, which collects and systematizes information about products and services of various Indian companies. Due to simplification of relations between buyers and sellers, there is an increase in electronic sales on this site. Buyers can choose different types of goods from different manufacturers in one place. IndiaMart is the second B2B platform in the world (after the Chinese company Alibaba). In 2014, IndiaMart launched Tolexo, a specialized e-platform for promoting small and medium-sized businesses. There is another evidence of the development of electronic commerce in India. For example, Amazon partnered with the second largest retailer in India, Future Retail. Future Retail stores will use Amazon India’s marketplace for online sales, and the company will also connect to Amazon’s Prime Now platform, which delivers goods in two hours. The partnership with Future Retail is Amazon’s response to the launch of an online store for India’s largest food retailer, Reliance Retail. But at the same time, there is practically no legal regulation of electronic commerce in India.

India’s Electronic Commerce Act was passed in 2000. In connection with the adoption of this Act, it was planned to introduce a special taxation regime, which would consist of the following: equal taxation of e-commerce and traditional trade; constant monitoring of trade flows, changes in technology and business practices; international consensus on protection of national interests (Kumar, 2017). The main task of the Act was to ensure legal recognition of transactions through electronic data interchange (EDI) and other means of electronic communication, commonly referred to as e-commerce. The goals were to replace paper-based methods of transferring and storing information, facilitate electronic filing of documents with government agencies and, in addition, amend the Indian Penal Code, the Indian Evidence Act of 1872, the Bank Certificates Act of 1891 and the Reserve Bank of India Act of 1934 on matters related to electronic commerce. But the paradox of the situation is that the above laws did not regulate legal relations in electronic commerce, as it is more focused on cybercrime, therefore it mostly regulates not civil, but criminal legal relations.

In 2020, India introduced the Consumer Protection (E-Commerce) Rules, which aims to restrict the practice of giving some sellers preferential treatment. The rules provide space and equal treatment for individual and small sellers on such platforms, and also eliminate the possibility of unfair trading practices on the part of large sellers. In addition to regulating e-commerce platforms of Indian origin, the E-Commerce Rules also governs foreign e-commerce platforms.

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Today, the Indian legislator also needs to create a special normative act that would regulate legal relations in the field of electronic commerce since the above facts indicate active development of e-commerce, and in order for the activity to be effective and safe for users, it must be regulated by law.

6. South Africa

To complete the study of legal regulation of electronic commerce, it is necessary to analyze the legislation of the Republic of South Africa. This research area is also relevant for this state, as evidenced by the following fact: according to UNCTAD research, in 2018, South Africa took the 77th position out of 151 economies in the B2C e-commerce index; and on the African continent, this state occupies the 2nd place in terms of e-commerce.22 The country has three major online e-commerce platforms — UAfrica, Shopify, and BidorBuy.

A study of the legislation of the Republic of South Africa showed that in 2012, the country adopted a regulation called the Bill of Changes in Electronic Communications and Transactions.23 This act is of interest to our study because it defines a commercial electronic transaction — the sale or purchase of goods or services by businesses, households, individuals, governments and/or other public or private entities, which is conducted through electronic communication networks and/or electronic means of communication, and include ordering, payment of remuneration and/or delivery of goods or services.

The South African legislator also defines an information network — a system for creating, sending, receiving, storing, displaying or otherwise processing data messages, including the Internet and electronic communication networks, where electronic communication networks are located. The law also contains a definition of an electronic transaction — a transaction carried out using electronic means of communication. It is particularly important to highlight the concept of consumer — any natural person who enters into or intends to enter into an electronic transaction with a supplier as an end user of goods or services offered by this supplier.

The peculiarity of legislation in South Africa is that terms related to electronic commerce are present to a sufficient extent, but there are no special rules that would regulate the content of these legal relations. This seems to be insufficient, especially with regard to resolving possible disputes arising in connection with electronic commerce.

Conclusion

Based on the above study, the following conclusions were made. E-commerce is firmly entrenched in our lives, and the coronavirus pandemic shows that this area has great

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potential and needs adequate legal regulation, including to ensure consumer rights. At this point, due to insufficient legal regulation in the field of e-commerce, there are a number of problems, among which we can distinguish unfair competition among aggregators, insufficient consumer protection, as well as uneven development of e-commerce in individual countries.

A comparative analysis of the legislation in the BRICS countries showed that the absence of a unified law on electronic commerce and application of legislation on consumer protection by analogy is not effective. Of course, civil law, consumer protection law, and information technology law can, to some extent, settle simple disputes in the field of electronic commerce, for example, return of goods, or refusal to transfer goods. But legal relations are evolving, and application of disparate rules will soon become insufficient to resolve conflicts. The lack of adequate legal regulation can lead to a decrease in the confidence of foreign investors and consumers. The PRC Law “On Electronic Commerce” can be considered a model for regulating this field of activity, because it explains all the essential conditions of legal relations. The Chinese experience in creating a legal framework for e-commerce is a convincing evidence of the effective economic and legal policy pursued by the state authorities, which resulted in China’s undisputed leadership in the e-commerce market among all other BRICS countries and can be used by other countries, taking into account national realities.

Acknowledgments

I would like to express my gratitude to the lecturers of the Institute of Law of South Ural State University for their assistance.

References

On de-risking and de-dollarizing intra-BRICS trade via smart contracts

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Abstract
This study explores the existing systemic barriers to intra-BRICS national currency use (“de-dollarization”) in currency swaps and trade finance. The author examines the current de-dollarization initiatives, as well as the actual levels of de-dollarization in Russia’s intra-BRICS settlements (as a representative sample), to find gaps between de-dollarization goals and current initiatives and offers a near-term phased solution to overcome these gaps and de-risk trade within BRICS. It is found that 1) the New Development Bank’s Contingency Reserve Arrangement has built-in systemic barriers which are preventing direct currency swaps between BRICS member states; 2) the Euro is replacing the Dollar as Russia’s preferred settlement currency within BRICS, indicating a gap between Russian traders’ settlement currency choice and BRICS de-dollarization priorities; and, furthermore, 3) while payment and settlement systems are being integrated and FinTech applications are being explored, efforts to fundamentally address the systemic market factors preventing national settlement use are missing. A phased solution is proposed to address the fundamental market barriers to national currencies by using smart contracts to de-risk intra-BRICS trade. Specific mechanisms are outlined to promote trade contracts in national currency and reduce dependency on both the Dollar/Euro and Western institutions (such as the IMF and Western commodities markets), a high-level architecture is proposed, and implementation considerations are discussed.

Keywords: blockchain, currency swap, de-dollarization, de-risking, foreign exchange, smart contract, trade finance.


Introduction
The BRICS countries adhere to the longstanding goal of de-IMFing and de-dollarizing their trade settlements and reserves in order to increase their sovereignty over transactions and
avoid currency exchange losses, and propose the creation of a Multilateral Clearing Union to achieve this goal. The Contingency Reserve Arrangement was the implementation of the Multilateral Clearing Union, but fell short of meeting the original purpose due to its IMF linkage requirements and limited scope, symptomatic of a lack of trust between BRICS member states. Furthermore, several systemic factors prevent the wider use of BRICS national currencies in trade finance, which are elaborated upon in the following section.

1. Barriers to intra-BRICS de-dollarization in the CRA and trade finance: Literature review

The strategic report of the BRICS New Development Bank *The Role of BRICS in the World Economy & International Development* details a long-term vision of the direction of the BRICS countries’ economic cooperation. The strategic report makes the case that reforms in existing Western institutions will not be in favor of the BRICS countries in the near future, and hence emphasizes the importance of a new Multilateral Clearing Union (MCU) that will serve as an intra-BRICS currency swap pool and tackle balance-of-payment shortcomings, trade finance, financial crisis aversion, and an overall restoration of sovereignty through de-dollarizing BRICS trade (NDB, 2017). This intention was also echoed in the 2017 BRICS Xiamen Summit declaration, which stated:

“We agree to communicate closely to enhance currency cooperation, consistent with each central bank’s legal mandate, including through currency swap, local currency settlement, and local currency direct investment, where appropriate, and to explore more modalities of currency cooperation. We encourage the BRICS Interbank Cooperation Mechanism to continue playing an important role in supporting BRICS economic and trade cooperation. We commend the progress in concluding the Memoranda of Understanding among national development banks of BRICS countries on interbank local currency credit line and on interbank cooperation in relation to credit rating” (UToronto, 2017).

In parallel to the Xiamen summit, the R5+ (Real, Ruble, Rupee, Renminbi, Rand, in addition to the currencies of BRICS+ countries) currency initiative was launched, which sought to stimulate the use of national currencies for “investments, long-term projects, creation of common payment card systems and common settlement/payment systems, cooperation in promoting BRICS+ currencies towards reserve currency status” (Lissovolik, 2017).

The New Development Bank’s Multilateral Clearing Union was manifested in the form of a $100 billion Contingency Reserve Arrangement (CRA) that BRICS countries had devised as a pool for swapping currencies in times of need and increasing the volume of settlements in national currency. The CRA included two currency swap instruments to support short-term balance-of-payment (BoP) pressures between a country’s current and capital accounts: 1) a liquidity instrument to provide support in response to current BoP gaps; and 2) a precautionary instrument to buffer against future BoP gaps. A country’s access to the shared capital funds was limited by conditionality, as only 30% of accessible funds (“de-linked portion”) were available on demand, whereas the major part, 70% of
accessible funds, requires on-track arrangements with the IMF, as the CRA’s rationale document explains:

“Where financing in excess of this 30% limit is required, an ‘IMF-linked portion’ will be made available. This will allow the country access to the remaining 70%, provided that a conditionality-based agreement with the IMF is concluded” (Biziwick et al., 2015, p. 316).

It is worth noting that rather than having a mechanism for direct currency swaps, as was set out in the MCU strategy report, a swap transaction was defined as “the Requesting Party’s central bank purchases US dollars (USD) from the Providing Party’s central bank in exchange for the Requesting Party Currency, and repurchases on a later date the Requesting Party Currency in exchange for USD” (Biziwick et al., 2015, p. 316).

The IMF linked component and USD reserve currency status raise questions about whether there is a potential mismatch between the stated goals of the MCU and the CRA’s implementation mechanism. Karataev et al. write:

“Though the BRICS countries have established a Contingent Reserve Arrangement... the currency swap under this arrangement is one between US dollar and local currencies of BRICS, not one among the BRICS currencies. Currently, there are few local currency swap agreements in force (between Russia and China, China and South Africa)” (Karataev et al., 2017, p.110).

The key barriers hindering the CRA’s success in achieving its stated goals, including the CRA’s promissory model, limited size (mirroring the limited paid-in capital allocated to the BRICS New Development Bank), and linking to the IMF, stem from the CRA modeling itself after the ASEAN+3 Chiang Mai currency swap initiative, which had a limited scope, operated on a promissory model rather than an actual capital pool, and carried a significant IMF-related portion due to the lack of financial surveillance capacity and moral hazard of borrowing. On a macro level, “the CMI/CMIM arrangement has been criticized as utterly ineffective (it did not play any role in the 2008 crisis, for example), and the concern is that, by adopting its form, the CRA is condemning itself to a similar fate. Size and IMF linking (along with the lack of a rapid response facility) seem to have been major problems with the CMI/CMIM arrangement...the IMF linking seems hard to reconcile with the intention to provide a counterweight to the IMF” (Biziwick et al., 2015, p. 318). Thus, as was the case with the Chiang Mai currency swap initiative, the BRICS NDB’s CRA’s promissory model, limited size (mirroring the limited paid-in capital allocated to BRICS’ New Development Bank), and IMF linking all stem from a fundamental lack of trust among BRICS member countries regarding their self-reliance in monitoring and managing each other’s and common funds, as well as greater trust in the IMF for this purpose. Despite their stated desire to break away from IMF’s conditionalities and dollar-denominated trade, at least in the CRA, the BRICS countries have inadvertently followed the precedents set by the hegemons.

This status quo is not inevitable, and reducing the linkage to the IMF would require “developing macroeconomic monitoring capacity and modalities for a rapid crisis response facility” (Biziwick et al., 2015, p. 320). A coordinated reform of the CRA with
the introduction of an internal credit monitoring mechanism amidst swap instruments in national currencies is needed to build the foundation for true independence from the IMF and dollar-denominated transactions and restore trust in the CRA.

To supplement CRA reform, Karataev et al. outlined two key fundamental barriers to the use of national currencies to finance trade in BRICS, which need to be overcome as a supplement to intra-BRICS currency swaps. The key barriers were identified as follows:

1. **Currency Volatility**

   Exchange rate fluctuations create uncertainty in optimizing settlement pricing and profitability at the time of contract execution, both from the perspective of exporters and importers. “Exporters will seek to denominate their contracts in foreign exchange when their national currency is devaluing. It will allow them to receive additional profits in the national currency... (whereas) importers shall be encouraged to invoice a contract price in their national currency in order to reduce costs and prevent a decline in demand as a result of rising prices.”

2. **Global Commodity Benchmarks**

   “Exporters of similar goods [i.e. commodities]... will seek to establish the contract price in the same currency as their competitors. That allows them to neutralize more successfully the adverse exchange rate fluctuations resulting in considerable price changes and therefore prevent the risk of reducing demand. As a result, the market price of such goods is denominated mostly in the US dollar... the global commodities exchange trade in these goods plays a significant role... if the global commodities market’s impact on the pricing model will decrease, the use of the USD as invoicing currency will decline too” (Karataev et al., 2017, pp. 20, 19).

Hence, the dominant factors preventing the use of the BRICS currency in trade were exchange rate fluctuations forcing exporters to optimize profit margins by using foreign currency (usually denominated in dollars), as well as industry benchmarks for export goods pricing, especially the influence of global commodity exchanges denominated in dollars. Amongst the BRICS countries, this holds true for Russia’s largest energy exporters who often prefer to be paid in dollars or euros in order to maintain standardized price points and obtain additional rubles in case of depreciation (Doff et al., 2019).

However, empirical research conducted by Nakajima et al. (2020) using the vine copula method and the value-at-risk model has found that the use of BRICS currencies in energy trade resulted in more stable prices and avoided transfer risks compared to the use of dollars due to counter-balancing movements with oil prices. Thus, though dollar-denominated oil contracts may provide short-term benefits for exporters, the overall commodity trade between the BRICS countries would benefit from the use of national currencies.

2. **Current status**

As a representative sample to measure progress in de-dollarization, we can analyze trends in the currency composition of Russia’s publicly available intra-BRICS trade settlements
since the launch of prominent de-dollarization initiatives in 2017, as shown in Figure 1 below. The percentage of Russian exports to the BRICS countries calculated in dollars fell from its peak of above 80% in the first quarter of 2018 to 33.2% in the first quarter of 2020 (CBR, 2020). While Russian exports to BRICS have recently been de-dollarized, it is apparent that instead of BRICS currencies, the Euro has replaced the Dollar as the dominant export settlement currency (Russia receives only 13% of its exports in Rubles as of Q1 2020).

![Figure 1](http://www.cbr.ru/vfs/statistics/cur_str.xlsx)

**Figure 1.** Percentage of settlement currency for Russian exports to BRICS

This trend is due to the fact that Russian energy exporters currently prefer to denominate contracts in euros rather than rubles (Yagova, 2019) for the same reason they previously preferred to denominate contracts in dollars: a greater amount of rubles received in case of depreciation. By contrast, Russian imports from the BRICS countries are still largely settled in dollars as of Q1 2020, though there is a gradual de-dollarization trend present. The “other” currency slowly growing in imports settlements is most likely largely comprised of the Yuan Renminbi, as China and Russia have recently accelerated the use of the Ruble and Yuan in trade (Simes, 2020). Despite this, overall, it is noteworthy to mention that Russia’s inter-BRICS trade is mostly settled in dollars and euros, and not in rubles or any other BRICS currency, which indicates a gap between the choice of the settlement currency by Russian traders and BRICS’ de-dollarization priorities. Though the Euro replaces the Dollar as Russia’s preferred export settlement currency within BRICS, the Euro presents smaller but similar risks of being armed with sanctions, given that it is still a non-BRICS third-party currency and European Union sanctions against Russia may be expanded in the near future in light of political events unfolding in 2020 (i.e., EU-Russia differences over the protests in Belarus, the Navalny incident, etc.).

To overcome the remaining barriers to using national currencies, BRICS is currently taking the following steps: developing an in-house settlement system for trade finance based on the Russian SPFS alternative to SWIFT (Yahoo Finance, 2019), linking domestic

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payment systems in order to create the New International Payment System (NIPS) (Surve, 2018), as well as researching feasibility requirements for creating a single BRICS cryptocurrency (CoinTelegraph, 2019a). In addition, while progress has been made in diversifying the NDB’s loan denominations to include more local currencies with a goal of 50% project financing in the near future, according to the NDB president (Hancock, 2019), more widespread internationalization of BRICS currencies will require the creation of mature bond markets in all BRICS countries to compete with Western bond markets. This was initiated by the creation of the BRICS Local Currency Bond Fund during the declaration of the BRICS Xiamen Summit in 2017:

“We agree to promote the development of BRICS Local Currency Bond Markets and jointly establish a BRICS Local Currency Bond Fund, as a means of contribution to the capital sustainability of financing in BRICS countries, boosting the development of BRICS domestic and regional bond markets, including by increasing foreign private sector participation, and enhancing financial resilience of BRICS countries” (UToronto, 2017).

Though these steps are cumulatively designed to increase autonomy over intra-BRICS fund flows, they do not, however, address the fundamental gap in de-risking the barriers to the use of national currencies in BRICS settlements that constrain their wider use. Russia’s Central Bank Governor Elvira Nabiullina echoed this sentiment in 2019 when she claimed that while gold-pegged cryptocurrencies were being researched, it was more important to develop international settlements using national currencies (CoinTelegraph, 2019b). Thus, while BRICS payment and settlement systems are being integrated, BRICS local bonds are being developed, direct currency swap lines are being expanded, and an intra-BRICS cryptocurrency architecture conceptualized and brought to market, a crucial intermediate supplementary step in de-dollarizing inter-BRICS trade finance is establishing de-risked and mutually trustable intra-BRICS trade contracts to expand national currency settlement, overcoming the market barriers mentioned previously.

3. Steps needed for de-risking trade:
   Gap identification

Karataev et al. proposed a multi-tier circular system whereby national and intra-BRICS financial institutions complemented and coordinated BRICS trade settlement transactions to create a robust system for using local currencies. The component steps were outlined as following: 1) expanding direct currency trading and lowering transactions costs; 2) creating and using hedging instruments in BRICS currency pairs that would reduce risk management costs; 3) expanding swap agreements and limiting liquidity risk; 4) developing the local currency bond market in conjunction with trade and development goals; 5) reinvesting trade surplus into local bond markets; 6) diversifying bond markets and coordinating BRICS policy on the use of these instruments to achieve the goals of currency internationalization (Karataev et al., 2017, p. 111).
Of these measures, the CRA is designed to meet the needs of step 3, whereas progress has been initiated by steps 4–6, as noted previously. However, concrete initiatives are needed to fulfill steps 1 and 2. Karataev et al., in particular, specified three key exchange mechanisms that need to be established to lower transaction costs and de-risk the use of national currencies in intra-BRICS trade contracts in order to overcome the aforementioned barriers to the first two steps mentioned above:

1. BRICS interbank foreign exchange market, whereby “companies should be able to purchase/sell a currency quickly and without additional costs to make settlements in such currency. This presumes the existence of a highly developed and liquid interbank and forex markets with large numbers of participants and convertible financial instruments” (Karataev et al., 2017, p.18).

2. Currency hedging instruments. “It will be necessary to encourage trading directly in BRICS currencies that will significantly contribute to lowering costs. This step [BRICS Trading pairs] has to be augmented with creation and use of hedging instruments in BRICS currency pairs which might allow to reduce risk management costs. During the first stage leading public banks of BRICS countries may function as market makers on currency pairs to provide necessary liquidity” (Karataev et al., 2017, p.110).

3. BRICS commodity exchange. “Launching of a Commodity Exchange or some type of an e-trading platform for trade in goods and derivatives of various kinds can be one more instrument contributing to enhancing LCY [local currency] use in settlements in the BRICS countries... raw material trade could be mediated by setting market prices denominated in local currencies. With appreciable quantity of foreign investors trading on the exchange, this will lead to internationalization of contracts denominated in local currencies” (Karataev et al., 2017, p.112).

In addition to the above three exchanges, de-dollarization of intra-BRICS trade requires the removal of the IMF-linked portion of the CRA in order to enable direct currency swaps to take place, granted the existence of bilateral swap agreements between all BRICS countries. A necessary replacement of the current IMF arrangement must be established between the BRICS countries: a counter-party de-risking mechanism which serves as an independent source of trust to validate the eligibility criteria of trade-necessitated direct currency swaps, thus eliminating the need for on-track IMF arrangements and subsequent conversion of US dollars.

Currently, all BRICS countries are largely reliant on Western facilities for the above four types of exchanges. SWIFT largely dominates international interbank transfer settlements, with the Russian and Chinese SWIFT alternatives operating mostly domestically, though there are plans to integrate the BRICS settlement systems as mentioned previously. For mitigating currency volatility risk, the BRICS countries have yet to develop a comprehensive intra-BRICS hedging mechanism independent of dollar- and euro-denominated Western capital markets. Thus, to overcome the reluctance of BRICS traders to take trade finance loans and settle in BRICS national currencies, it is necessary to introduce forward hedging options with minimal cost of carry, so that traders can avail direct hedging options simultaneously with trading
contracts to de-risk their trading contract in national currencies. As Karatev et al. concluded, in the long term, boosting demand for BRICS direct currency settlements would itself partially smooth out some of the volatility experienced by cyclical flight of Western capital, thus lowering the risk premium and cost of carry for forward contracts and making BRICS currencies a natural preferred choice in trade finance (Karataev et al., 2017, p.110).

After a currency options market, a BRICS commodity exchange should be created where commodity prices are denominated in national currencies and accompanied by derivatives and other risk hedging options that minimize the combined effect of currency and commodity price fluctuations, essentially serving as a favored market for BRICS commodity importers and exporters who set contracts in national currencies and have instruments to de-risk any expected volatility. The most significant example of a local currency commodity exchange within BRICS is the Petro-Yuan futures market launched in China in 2016, which served as a viable alternative to the dominant dollar-denominated WTI and Brent oil exchanges. Though Russia has created a similar exchange in the form of the Ural oil futures market, there is still work to be done to achieve maturity and use at the level of established commodity exchanges.

Combined with direct currency swap lines and an intra-BRICS free trade zone, the implementation of the above mechanisms will reduce the transaction cost of settlements in the national currencies of the BRICS countries by lowering the risk premium for importers and exporters when entering into contracts in national currencies amidst exchange rate uncertainty. In this way, these exchanges will fulfill the BRICS goals of “focus[ing] joint efforts on providing companies engaged in foreign trade from BRICS countries with the same, or lower transaction (compliance) costs, guarantees of settlement and risk management that they currently have in utilizing the dollar, euro or yen” (Karataev et al., 2017, p.110–111).

4. Role of smart contracts in de-risking trade

In the context of the above steps necessary to de-risk the use of national currency in intra-BRICS trade, special attention must be paid to the recommendation of experts from the Chinese Academy of Social Sciences:

“...establishing the BRICS cross-border interbank payment system on the basis of Blockchain technology might be a key step of BRICS cross-border financial infrastructural construction. Such infrastructure would not only significantly improve the efficiency of cross-border interbank payment among the BRICS countries but also exert a fundamental impact on the international monetary and financial system. Given that Blockchain is safe, transparent, distributed and tamper resistant, the trust model between financial systems would no longer rely on intermediation and many banks will establish “decentralized” ties and realize real-time digital transactions. The removal of the intermediary link of the third-party financial institution means cross-border payment will no longer depend on such systems as SWIFT and CHIPS” (Karataev et al., 2017, p.113).
Furthermore, in 2018, export-oriented development banks from all BRICS countries signed a MoU aimed at enhancing the understanding of distributed ledger or blockchain technology, with the aim of identifying areas to improve operational efficiencies and tackle common financial challenges (InfoBRICS, 2018). In 2019, the BRICS business council formed a working group studying the possibility of creating a special trade-facilitating BRICS cryptocurrency to ensure uninterrupted paperless document flow for trade obligations, as per State Duma’s expert council member Nikita Kulikov (CoinDesk, 2019).

In fact, in order to achieve the BRICS goal of de-risking trade settlements in national currency there is no need to create a specialized cryptocurrency for document flow. The simplest, yet most advanced and low-cost blockchain feature that enables the aforementioned four exchanges to take place directly between BRICS traders and banks (and allows a seamless disintermediation of transactions between separate parties without the need for outside third parties such as the IMF) is smart contracts, an original feature of Ethereum networks later adapted by other blockchain networks. Smart contracts allow multiple parties to program and pre-set conditional criteria for contracts based on fulfillment of services or market conditions, as well as automate the verification of fulfillment criteria via decentralized external verification mechanisms known as oracles, which are blockchain middleware that creates a secure connection between smart contracts and various off-chain resources required for fulfillment. Funds needed to execute the contract can be temporarily pre-stored in a linked virtual escrow–like account associated with the contract to guarantee fund availability at the time of execution (XRP Ledger, 2020). Once the contract execution date arrives and conditional fulfillment checks are completed, smart contracts self-execute and disburse associated payments to the contracting parties, automating execution and settlement, as well as eliminating contractual disputes and risks of non-fulfillment of obligations by counter-parties.

Due to their automated execution capabilities and disintermediation of third-party legal and settlement entities, smart contracts are starting to gain momentum in Western consortiums for trade finance, currency trading, and commodity trading in the mainstream dollarized economy. Trade finance systems based on smart contracts currently allow to reduce costs by an average of 35% and eliminate 1–2 weeks of settlement processing time, as well as eliminate the possibility of manual errors (Blockdata, 2019). However, rather than piling up existing Western (mostly American and European) trade platforms, which unfortunately carry similar jurisdictional and U.S.-influenced control barriers as SWIFT (especially given the expanding reach of U.S. regulatory bodies into digital currencies and alternative payment industries), the BRICS countries can chart an independent path free from potential financial weaponization by developing a comprehensive in-house system of smart contracts and distributed ledger trade incorporating the essential elements of trade finance, currency trading, and commodity trading, as well as linking it to the new intra-BRICS settlement and payment systems under development. In such a system, smart contracts will allow for comprehensive BRICS interbank loans for trade finance with a set of conditional parameters, including forex options and futures contracts, coupled with a special BRICS-only commodity exchange with its own commodity futures options for
intra-BRICS buying. BRICS traders will act as counter-parties to all contracts, which eliminates the risk of using currency and commodity trading for speculative purposes and enhances trust.

5. **Key requirements and stages of smart contract implementation: Results**

To ensure comprehensive large-scale implementation of smart contracts and distributed ledgers for such an all-in-one platform for BRICS traders independent from existing Western platforms, and to build new intra-BRICS exchanges to de-risk trade finance, a pilot step can begin with an intra-BRICS Trade Finance Smart Contract Fulfillment system distributed app (aka “Dapp,” as blockchain apps are known) that replaces traditional letters of credit between merchants and banks, and uses automatic production and shipment data, rather than traditional bills of lading as a source of fulfillment verification.

In parallel, another smart contract based distributed app for facilitating direct interbank transactions should be developed, replacing traditional correspondent-account based bilateral bank loans with decentralized smart contracts for interbank transfers for trade finance in accordance with the corresponding NDB CRA currency swap limit.

Ideally, once these two pilot systems are up and running, both systems should be prevented from using SWIFT or Western transfer services to ensure financial security free from external interference. Instead, they become operationally interwoven with intra-BRICS payment and settlement systems currently under development, integrated using Ethereum middleware such as ChainLink to connect to a BRICS private distributed ledger network, either developed in-house or with tailored application layers on an existing open-source private enterprise Ethereum platform such as Quorum or Hyperledger Besu.

Once such an integration proves reliable, parallel distributed apps should be designed on the BRICS private distributed ledger to establish intra-BRICS-only exchanges for currency options and commodity futures associated with trade transactions. Such an exchange will serve as a preferred market for de-risking national currency settlements within the framework of BRICS trade finance and will have restrictive access to prevent speculative manipulation of both currency and commodity rates. The key requirements for such an exchange are:

- Seamless integration and interoperability with Central Bank, Commercial Bank, New Development Bank swap lines and intra-BRICS settlement systems
- Live feed-in to market pricing data when setting up a contract and prior to its execution
- Integration with cargo delivery data to change the order execution date
- Pre-set call/put and contract amount limits set by the BRICS NDB
- Support for large volume contracts with minimal latency
- Scalability to further expand transaction throughput
• Decentralized oracle system for contract fulfillment verification via market data
• Temporary storage of funds in special accounts via distributed ledger
• Secure permitted access. Not subject to SWIFT-like constraints.

The author proposes a high-level architecture for a decentralized all-in-one BRICS trade finance system, as illustrated below. The high-level steps involved would take place as follows:

1. Smart trade contracts are set up through the dedicated BRICS trade finance distributed app for execution after a fixed period tied to goods delivery (e.g. on the next business day after the anticipated delivery date).
2. Simultaneously, traders set up desired currency hedging options and commodity futures contracts as applicable through the respective dapps, in line with the pre-set call/bid margins and cost-of-carry limits for all combinations of BRICS currency pairs established by the BRICS NDB, and use live market data to aid them. They are coded as smart contracts designed to mature on the same date as the trade delivery.
3. The NDB CRA direct pair currency swap lines are reviewed daily to ensure the adequacy of swap amounts for upcoming contacts maturing over the next 30-day period, and those contracts that fall outside of the credit swap limits are given an option to mutually annul the contract and use a third-party currency for fulfillment instead.
4. At fixed intervals of 7 days, 3 days, and 1 day prior to the initial anticipated delivery date, the delivery status is tracked to ensure timeliness. In case of anticipated delays, contract fulfillment date is pushed back and updated in the smart contract.
5. Initially, with the aim of building trust and de-risking, no margin purchases would be allowed. Full funds will be required prior to settlement. Thus, 3 days prior to the contract fulfillment date, the smart contract will output a “worst-case scenario” fulfillment amount under the contract terms, and the new interbank settlement system will allocate funds to special accounts stored in the BRICS distributed ledgers. After a successful 1-year pilot project where trust is established, this step can be eliminated to allow traditional trade loans.
6. As soon as the goods delivery is confirmed, market data, including current direct exchange rates, commodity prices, and other live rate data will be refreshed in the decentralized oracle network at the time of contract maturity to compute the execution amount for both the trade settlement and the associated currency option and purchased commodity future.
7. The oracle network will execute the contracts and release the final settlement to the seller in its exporting currency (or, if previously agreed, in importing currency as an exception) — the difference between the worst-case maximum funds and the actual fulfillment amount will be refunded to the buyer’s account (if desired, it can be retained for future purchases). In the future, traders will have options of redeeming funds through the integrated P2P payment systems of BRICS or the BRICS cryptocurrency, allowing small and medium sized e-commerce traders to have the same access to the BRICS market.
On de-risking and de-dollarizing intra-BRICS trade via smart contracts

Figure 2. Phased smart contract BRICS trade finance architecture
6. Implementation considerations: Discussion and recommendation

Key considerations when designing and implementing a distributed multi-functional large-scale integrated solution, such as the one described above on blockchain, are: 1) latency and throughput; 2) interoperability, scalability, and versatility; 3) data privacy and security, and finally; 4) energy consumption costs and token fees.

To address these concerns, it is necessary to integrate the latest developments into protocols underway. Ethereum 2.0, to be released in November 2020, will increase transaction throughput from the current bottlenecked 14/second to 100,000/second, as well as move computations from an energy-intensive proof-of-work blockchain to a proof-of-stake one and enhance data security (DeCrypt, 2020). Furthermore, it will be necessary to deploy scriptable smart contracts for both program variable fulfillment criterion and tie-in with external data. Chainlink has a modular “middleware” for external data connectivity, as well as a decentralized oracle network which is necessary for trust validation amongst participants in BRICS transactions. For data access control, BRICS-only dapps can be built on a permissioned version of the enterprise blockchain and integrated using secure APIs for the intra-BRICS payment systems. Current western trade finance tracking systems such as MAERSK’s Tradelens, IBM’s WeTrade, and R3’s Marco Polo use enterprise blockchains, including Hyperledger Fabric and CORDA; BRICS may be interested in either adapting these existing platforms or developing its own, depending on its core requirements and integration requirements with the BRICS settlement interbank messaging systems.

There is, however, an inherent issue of token fees, which in Ethereum are known as gas fees, to compensate for the cost of energy use to facilitate transactions. With the Ethereum native token Ether (ETH) constantly growing in price, and Ethereum 2.0 not bringing a viable solution to increasing gas fees, intermediary layer computational solutions and third-party APIs are currently being developed to offload transaction processing off the Ethereum mainnet network (CoinTelegraph, 2020). An alternative implementation is possible by using smart contracts with a centralized ledger, without blockchain, tokenization or distributed ledgers. The world’s biggest commodity pricing firm, S&P Global Platts, has implemented such an exchange (TradeVision), sacrificing an additional level of security and verification in exchange for significantly lowered cost and efficiency (Ng, 2019). BRICS may be interested in tracking this model for feasibility, using its own centralized ledger instead.

When assessing steps for implementation of this integrated all-in-one solution to de-risk trade finance, the BRICS Business Council Blockchain Working Committee, initiated during the 2017 Xiamen Summit, should conduct a gap analysis of key requirements for an ideal comprehensive intra-BRICS trade finance solution, supplementing some of the key issues outlined in this paper. The most important factor to keep in mind is interoperability between all the BRICS trade, settlement, payment, and crypto solutions under development, individual Central and commercial
banks, as well as the NDB CRA’s swap line facilities. Though this proposal suggests a particular implementation scheme, it is recommended that the BRICS Blockchain Working Committee assess the merits of all implementation design options, including centralized vs. decentralized ledgers, on vs. off ledger fund flow allocation, ledger access control between commercial and Central banks and individual traders, margin funding of large volume serial contracts, and funding guarantee requirements. Only then can a comprehensive IT architecture be performed, followed by pilot/sandbox testing of individual components and project budgeting before commissioning such a solution on a BRICS private network, either developed in-house on the private Ethereum network, or with tailored application layers on an existing corporate Ethereum platform such as Quorum, depending on BRICS’ preference regarding the degree of isolating the solution partially or entirely from Western platforms. This is a high-level proposal to outline key considerations in that direction, in the hope that smart contracts will be used to disintermediate and de-risk BRICS trade finance in the near future.

Conclusion

The primary barriers to de-dollarization of intra-BRICS trade were identified as: 1) the lack of an independent CRA credit monitoring mechanism (and hence relegation to IMF for this purpose, resulting in dollar intermediation of CRA currency swaps); 2) currency volatility causing uncertainty in currency conversion amongst traders when exporters take advantage of dollar and euro denominated contracts in the event of devaluation; and 3) the lack of a non-Western commodity exchange which would allow national currency pricing and a futures market for energy trading. To address these barriers in BRICS currencies and de-risk trade, a phased solution based on smart contracts was devised to create more efficient intra-BRICS exchanges which supplement existing BRICS settlement and payment integration efforts.

The phased creation of smart contract-based trade finance, interbank market, currency risk hedging, and commodity exchanges within BRICS will serve as a source of mutual trust amongst BRICS Central and commercial banks and traders, encouraging national currency settlements for trade. BRICS traders will act as counterparties to all contracts in a closed ecosystem which eliminates the risk of currency and commodity trading being used for speculative purposes, something all BRICS countries wish to avoid. Thereby, the exchanges will facilitate bringing the NDB CRA currency swap mechanism to its original goal by eliminating the need for IMF-linked on-track arrangements and de-dollarizing the currency swaps themselves. In the long term, the exchanges will facilitate greater intra-BRICS demand for the currencies themselves, which will help smooth out at least some of the volatility of exchange rate fluctuations. In parallel, smart contracts can be used to automate trust in BRICS fund flows beyond trade, i.e. mutual intra-BRICS investment and NDB loans for infrastructure and sustainable development.
Acknowledgements

The author is grateful to Dr. Ninel Seniuk from the HSE for her mentorship during the “BRICS Economies and Russia” class, as well as for guiding me to participate in 2020 BRICS International School. The author is also grateful to the organizers of the 2020 BRICS International School, in particular, Valeria Gorbacheva, for the enlightening content and platform provided for young researchers, and to Dr. Marina Sheresheva who provided a platform for this article in the 2020 BRICS Journal of Economics Special Youth Edition in the hope of contributing and initiating a dialogue with the BRICS Business Council to assess the merits of the ideas presented here.

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Institutionalization of the BRICS discourse: How does the NDB embody the group’s views on global financial governance?

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Abstract
The architecture of global financial governance has recently been complemented by emerging economies’ efforts to coordinate policies, as exemplified by new coalitions of states and a new set of non-Western international institutions. BRICS, in its turn, has made a significant contribution in this direction by establishing the New Development Bank — an alternative to traditional mechanisms of financing development projects with an emphasis on sustainability. As a representative of the growing cooperation of the BRICS countries in recent decades, the NDB highlights most of the group’s views on financial governance. This paper applies a qualitative/analytical approach to the BRICS and NDB Communiqués and practices in order to demonstrate how the bank has managed to successfully institutionalize the group’s discourse over time.

Keywords: BRICS, global governance, New Development Bank.

JEL: F02, F50, F55, O19.

Introduction
The BRICS¹ countries were once labeled a group of reformist states,² given their common dissatisfaction “with the West’s geopolitical and geoeconomical dominance in the

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¹ The original acronym BRIC was borrowed from an article by economist Jim O’Neill (of Goldman Sachs) in 2001, in which he advised investors to pay close attention to Brazil, Russia, India and China as promising emerging economies for investments. By that time, during the first decade of the 2000s, all BRIC countries were growing rapidly; as an example, from 2000 to 2007 (before the financial crisis), the BRIC states’ GDP growth averaged more than 5%. China, in its turn, averaged almost 15% of GDP growth during this period.

² According to IR theory, states are usually classified as either status-quo, revisionist or reformist powers. Status-quo powers are generally associated with states whose main concern is to maintain their position/
world” (Sergunin, 2019, p. 102), as well as attempts to complement existing structures of global governance (Stuenkel, 2017). Western media, in its turn, accuse BRICS of being “an unwelcome challenge to the established world order as defined by the US-dominated... IMF and the World Bank” (Tisdall, 2012), seeing the group as a potential threat to the West’s dominant position in the international system (Sergunin, 2019). According to Lagutina (2019, p. 8), BRICS is actually fighting against “the hegemonic nature of the current world order and the unfair structure of the world economic architecture,” which is demonstrated by the group’s positions in all its summits and declarations.

On the one hand, as far as analyses of BRICS documents are concerned, it is possible to highlight the following points (including those not analyzed in this paper) regarding the group’s view on international relations: 1) the world should be multipolar, without any form of superpower dominance, and global politics should be defined by multiple centers of economic, political, and civilizational influence; 2) the architecture of financial governance should be reformed in order to empower emerging economies.

Therefore, to attain the aforementioned vision, in 2015, BRICS established the New Development Bank, whose creation, according to analysts, can be explained by BRICS’ “dissatisfaction with the slow pace of reform of existing institutions” (Acharya, 2017), translated into a general perception that it was difficult for established organizations (such as the IMF and the World Bank) to better match/accommodate the interests of rising powers in the system.

The bank is a materialization in the legal and economic field of a relevant political approximation between these countries, which, despite enormous differences, have similar characteristics in terms of territorial size, large populations and political weight in each of their specific regions (Fernandes & Freitas, 2020).

With an aim to demonstrate how the NDB came to “embody” the BRICS political approximation and institutionalize the group’s discourse and principles, this paper sets out the following tasks: (1) to describe the general view on the current state of global governance and the claim of emerging powers to greater representation in world politics; (2) to demonstrate BRICS’s role in this debate, as revealed in the group’s declarations, especially with regard to the necessary changes in (and the main criticism of) the Bretton Woods institutions; and (3) to highlight how the NDB incorporates the discourse and principles upheld by BRICS.

privileges/prerogatives in the system; meanwhile, states dissatisfied with their place in world affairs are often labeled revisionist, willing to significantly and sometimes radically change the rules and norms that govern the system to their own benefit; whereas reformist powers, albeit also dissatisfied with their place in the overall scheme of things (as revisionist states do), prefer to act on the basis of existing rules/norms, once advocating for gradual reform through negotiations and diplomatic means (Sergunin, 2019).

Russia, for instance, in its foreign policy concepts points to the attempts of Western states to maintain their hegemonic position in international relations, represented by the privileges enjoyed by the US and its allies in the Bretton Woods institutions. Therefore, in the 2000s, Russia joined forces with countries such as India and (especially) China in order to better resist the West and protect its national interests.

According to Bijian (2005, p. 24), even China, the most prominent member of BRICS, “does not seek hegemony or predominance in world affairs. It [instead] advocates a new international political and economic order, one that can be achieved through incremental reforms and the democratization of international relations.”
1. Modern view on the state of global financial governance

The Bretton Woods institutions were founded in 1944 to provide coordination among countries in order to avoid economic perils that had destroyed the international system during the interwar period (1919–1939) and included the World Bank (initially named the International Bank for Reconstruction and Development) and the International Monetary Fund (IMF). The latter currently consists of 188 member states that contribute to the organization by providing part of their international reserves. Therefore, when necessary, the Fund can allocate these resources by means of loans to help countries facing balance of payments deficits, provided they meet certain requirements/criteria established by the IMF itself.

Organizationally, countries with the largest number of quotas in the IMF are the ones with the largest share of votes and the ability to influence the institutions’ decisions and operations. The single most influential IMF state so far is the US with 16.51% of the total vote share. The World Bank, on the other hand, has an organizational structure that also resembles that of the IMF, where voting power is distributed according to each country’s participation as a guarantor of the bank’s capital. Currently, the members with the most votes are: the United States (with the right to veto any of the bank’s decisions), Japan, China, Germany, the United Kingdom, France, and India.

There is a long-term history of negative perception of the Bretton Woods institutions since the mid-1970s when less-developed countries started to interpret the open monetary and financial systems of global governance led by the US and its Western allies as perpetuating their underdevelopment and dependence. In the 1980s, developing nations in debt to the IMF were pressured by industrialized states to meet their commitments to the organization, whereas international aid was “dependent on neoliberal-style adjustment measures,” which led many countries to facing acute economic and political instability (Tkachenko, 2017).

During the 1990s, under the auspices of the United States, the adoption by many countries in the developing world of the so-called Washington consensus, which consisted of a “one-size fits all” development receipt including fiscal discipline, market deregulation, privatization of state assets, financial and trade liberalization, etc, ultimately provoked “less growth... in per capita GDP than in 1950–1980” (Rodrik, 2006, p. 975) in regions such as Latin America, for instance, followed by economic depression, inflation, and social instability. That was due to the fact that loans from both the IMF and the World Bank were “conditional on the adoption of consensus-inspired policy reforms” (Naim, 2000, p. 90), and countries in need of resources from these organizations had no leverage to oppose these requirements.

However, with the coming of the 21st century, in part due to dramatic changes in the context of global development in recent decades, many emerging economies have industrialized and urbanized at a pace never seen before in human history, and as a result,
Institutionalization of the BRICS discourse

Claims for a greater say and representation in the institutions created after World War II have become commonplace in world politics — a situation exacerbated by the limited mobility of states within the system and the difficulty for existing institutions to properly integrate emerging powers in their decision-making processes (Stuenkel, 2018).

Consequently, today both the UN system and the Bretton Woods institutions are facing acute problems of legitimacy, as many countries consider them “too Western-centric” and unrepresentative of the current distribution of power (primarily economic) in international affairs, and this criticism is especially directed towards the IMF and the World Bank. In fact, according to many states, the decades-old traditional system of global governance suits exclusively “the power and purpose of the US and the West” (Acharya, 2017, p. 10).

In this context, when the old post-war order under the leadership of the United States gave way to a more multi-faceted configuration of power, specialists started to write about a “crisis of transition” (Ikenberry, 2018) represented by new coalitions of states (such as BRICS) and new governance institutions (such as the New Development Bank) that had become the most evident signs of a perceived Western decline in world affairs. Especially after 2008, analysts affirm that “the financial crisis laid the foundations for the transformation of the world order and the redistribution of power centers in its structure: from the North and the West to the East and the South” (Lagutina, 2019, p. 5).

With the Western-led financial system of global governance becoming increasingly contentious and suffering from considerable distrust of its rules and norms, emerging economies are coordinating their actions to avoid future crisis, as well as to claim greater participation and responsibility in the world’s economic governance (Maringoni & Ribeiro, 2019). In addition to the above, Chinese President Xi Jinping, during a speech at the World Economic Forum in Davos in 2017, mentioned that although the global economic landscape had “changed profoundly in the past few decades... the global governance system has not embraced those new changes and is therefore inadequate in terms of representation and inclusiveness.”

1.1. Criticisms of the Bretton Woods system

The Bretton Woods institutions are frequently criticized as instruments “used by rich industrialized countries to control poorer ones... shoring up an economic system that benefits the wealthy at the expense of the poor” (Elias & Sutch, 2007, pp. 88, 164). The IMF, for its part, is seen by some government officials in developing countries as a financial institution used to persuade less-powerful states to open up their economies by adopting policies of deregulation and privatization and accepting external interference in their internal affairs (Cooper, 1996). As argued by some, for many years the IMF was pressuring states in the developing world to cut welfare spending in favor of debt repayment, while policies adopted under the auspices of the

organization’s experts promised to bring prosperity and economic stability, which ultimately did not happen.

In this regard, one IMF specialist even reported that the organization had in fact “seriously underestimated the perils of financial liberalization, both domestic and external” (Wolf, 2019), and memories relating to dependence on the IMF and debt repayment had instigated anti-IMF sentiment in many countries of the Global South. Brazil, for instance, was heavily indebted to the IMF in the 1980s and 1990s, which jeopardized the country’s national autonomy and deepened its dependency on international creditors. According to the previous Brazilian president, Dilma Rousseff, the country managed to achieve economic growth only when Brazil paid its debt to the IMF, provided it no longer had to accept its policies and recommendations.

Moreover, the number of voting shares enjoyed by the US and a handful of Western allies in the organization is considered one of “numerous examples of U.S. predominance in rule-making bodies that have given the United States competitive advantage” (Mazarr et al., 2014, p. 23). The overall dominance of the G7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) in the IMF is highlighted by their overrepresentation when it comes to their quotas/voting shares in comparison to their share (in %) of global GDP by PPP (purchasing power parity), as well as nominal global GDP (with the exception of the US). The G7 currently holds 41.2% of the voting shares of the IMF (before the 2010 quota reform, this percentage was 43%), while the BRICS countries, on the other hand, hold 13.54% (IMF, 2011) (see Tables 1 and 2).

<table>
<thead>
<tr>
<th>Country</th>
<th>Quotas (%)</th>
<th>Voting Shares (%)</th>
<th>% of Global GDP</th>
<th>% of Global GDP by PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>17.46</td>
<td>16.52</td>
<td>23.80</td>
<td>15.2</td>
</tr>
<tr>
<td>Japan</td>
<td>6.48</td>
<td>6.15</td>
<td>5.79</td>
<td>4.16</td>
</tr>
<tr>
<td>China</td>
<td>6.41</td>
<td>6.09</td>
<td>4.65</td>
<td>3.24</td>
</tr>
<tr>
<td>Germany</td>
<td>5.60</td>
<td>5.32</td>
<td>15.85</td>
<td>18.70</td>
</tr>
<tr>
<td>France</td>
<td>4.24</td>
<td>4.03</td>
<td>3.23</td>
<td>2.20</td>
</tr>
</tbody>
</table>

8 Brazil, in particular, as demonstrated by political discourse and documents, adheres to the interpretation of the Breton Woods institutions in the South-North framework, where the North consists of advanced capitalist economies whose historical dominance jeopardized the development of countries pertaining to the Global South, generally associated with Latin America, Africa and parts of Asia.


10 Although in terms of quotas/voting shares, the US is slightly underrepresented when it comes to its share of nominal global GDP, the country is overrepresented in the IMF compared to the country’s share of global GDP by PPP.

11 The most significant increase after the 2010 quota reform occurred in China, whose voting power increased from 3.8% to 6% after 2010 (IMF, 2011).
Table 1. Continued

<table>
<thead>
<tr>
<th>Country</th>
<th>Quotas (%)</th>
<th>Voting Shares (%)</th>
<th>% of Global GDP</th>
<th>% of Global GDP by PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>4.24</td>
<td>4.03</td>
<td>3.29</td>
<td>2.24</td>
</tr>
<tr>
<td>Italy</td>
<td>3.17</td>
<td>3.02</td>
<td>2.41</td>
<td>1.77</td>
</tr>
<tr>
<td>India</td>
<td>2.76</td>
<td>2.64</td>
<td>3.17</td>
<td>7.69</td>
</tr>
<tr>
<td>Russia</td>
<td>2.71</td>
<td>2.59</td>
<td>1.93</td>
<td>3.09</td>
</tr>
<tr>
<td>Brazil</td>
<td>2.32</td>
<td>2.22</td>
<td>2.17</td>
<td>2.49</td>
</tr>
<tr>
<td>Canada</td>
<td>2.32</td>
<td>2.20</td>
<td>1.99</td>
<td>1.37</td>
</tr>
</tbody>
</table>


Table 2. Voting Shares and Quotas: Comparison of G7 and BRICS

<table>
<thead>
<tr>
<th>Group</th>
<th>Quotas (%)</th>
<th>Voting shares (%)</th>
<th>Nominal GDP</th>
<th>GDP by PPP*</th>
<th>% of Global GDP</th>
<th>% of Global GDP by PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td>G7</td>
<td>43.51</td>
<td>41.27</td>
<td>(38.76 billion USD)</td>
<td>40.67 billion USD</td>
<td>45.16</td>
<td>30.18</td>
</tr>
<tr>
<td>BRICS</td>
<td>14.20</td>
<td>13.54</td>
<td>(19.83 billion USD)</td>
<td>43.24 billion USD</td>
<td>23.12</td>
<td>31.97</td>
</tr>
</tbody>
</table>

Sources: IMF, World Bank. Table elaborated by the author.

Non-Western countries such as China and India (both important BRICS members), for instance, are underrepresented in terms of quotas/voting shares in the IMF compared to their actual share of global GDP by PPP and nominal global GDP. This comparison regarding shares and quotas in the IMF between the countries of the Western bloc and BRICS is important, because, unlike the UN General Assembly, where decisions are made on the “one-country one-vote” principle, the IMF follows a corporative decision-making model, whereas the US (in particular) and the G7 (more generally) have a managerial advantage over this institution.

On this note, speaking at the UN in 2014, former Brazilian President Dilma Rousseff drew attention to the imperative of eliminating “the disparity between the growing importance of developing countries in the global economy and their insufficient representation and participation in the decision-making processes of international financial institutions,” which reflected Brazil’s (as well as BRICS’) perception of the lack of legitimacy of the IMF and the World Bank. For example, as part of their political coordination in the IBSA group, Brazil, India, and South Africa (three of the five current BRICS members) declared that an IMF reform “must effectively reduce the serious imbalance between the ample majority of voting power now held by advanced economies...

and the unsatisfactory participation of developing countries.” Chinese leader Xi Jinping also added that:

Countries, big or small, strong or weak, rich or poor, are all equal members of the international community. As such, they are entitled to participate in decision-making, enjoy rights and fulfill obligations on an equal basis. Emerging markets and developing countries deserve greater representation and voice.

Overall, as Barnett and Duvall (2005, p. 51) remind, “long-standing institutions represent frozen configurations of privilege” limiting the choices and mobility of other [less privileged] states within the system. According to the authors, structural power generally involves “hierarchical and binary relations of domination that work to the advantage of those structurally empowered” (Barnett & Duvall, 2005, pp. 5–6), while privileged members of the international community believe they are the only ones entitled to deal with matters of “global” significance. This perception, however, is contradicted by states that are dissatisfied with the lack of representation and voice in international decision-making mechanisms, states located as they are at the outer rings of “power.” In this context, the political coordination undertaken by Brazil, Russia, India, China, and South Africa in the framework of BRICS provides an important platform for these states when it comes to voicing their discontent and positions about the unfair nature of the Western-led global financial architecture.

2. BRICS discourse on global financial governance

An example of coordination of emerging economies with an aim to improve their position in the international system is the BRICS group, established in 2009 after the financial crisis and attesting to the tendency in world politics “toward convergence and interaction of states located thousands of kilometers away from each other” (Lagutina, 2019, p. 51). In effect, BRICS’ “common aversion to the dominant power of the G7, [and] particularly the United States” (Cynthia et al., 2018, p. 1) motivated the group to look for ways to shift the current system of global governance from a Western-centric model towards a more inclusive [one] (Lagutina, 2019), where emerging countries could play a greater role in decision-making.

BRICS, on the one hand, defines itself as “an important force for incremental change and reform of current institutions towards more representative and equitable governance,” representing 41.5% of the world’s population today. The group’s discourse often refers to the necessity to “reform the obsolete international financial and economic architecture which does not take into account the increased economic power of emerging market economies and developing countries” — a criticism that is constantly directed against the World Bank and the IMF, as shown in the previous sections of this paper.

13 http://www.ibsa-trilateral.org/images/1st_summit_declaration.pdf
15 http://www.brics.utoronto.ca/docs/120329-delhi-declaration.html
16 http://static.kremlin.ru/media/events/eng/files/41d452b13d9e2624d228.pdf
In its very first joint statement, the group declared its commitment “to advance the reform of international financial institutions, so as to reflect changes in the global economy,” which at that time represented a shift in wealth and economic power in favor of developing economies. The 2009 Declaration also criticized the procedures according to which the Heads of the World Bank and the IMF were chosen, suggesting instead that they should be appointed “through an open, transparent, and merit-based selection process.” The Head of the IMF has historically been a European citizen, whereas the World Bank has always been headed by an American. Thus, according to BRICS, a “merit-based selection process” should not take into consideration a specific nationality (or “regionality”) to occupy the top positions in the Bretton Woods institutions.

Moreover, BRICS acknowledges that:

Reforming these institutions’ governance structures requires first and foremost a substantial shift in voting power in favor of emerging market economies and developing countries to bring their participation in decision making in line with their relative weight in the world economy.

As the group advocates a “comprehensive review of the quota formula to better reflect economic weights,” BRICS opposes the West’s overrepresentation in the IMF, while calling on the World Bank’s leadership to shift its focus from a North-South cooperation paradigm to equal partnership among its members, thus overcoming “an outdated donor-recipient dichotomy” and moving away from a historical top-down (rich state — poor state) approach to development aid.

Thus, most of the aforementioned BRICS views on the current state of financial governance will materialize with the establishment of the New Development Bank (also known as the BRICS Bank), whose principles and organizational structure are scrutinized in the next section of our paper.

3. The New Development Bank as an embodiment of BRICS principles

During the first official BRICS summit in Yekaterinburg (Russia) in 2009, the group readily laid out a plan to create an investment bank to complement institutions such as the World Bank and the IMF (Labbé, 2018). Six years later, the group finally established the New Development Bank (NDB), whose goal is to finance sustainable development projects not only in member states, but also in other emerging countries. The bank’s goal,

17 http://en.kremlin.ru/supplement/209
18 Ibid.
19 According to an IMF expert, in order for an institution “to be credibly global, its top job cannot be permanently left in the hands of a European, however admirable some of those Europeans have been” (Wolf, 2019).
20 http://www.brics.utoronto.ca/docs/100415-leaders.html
21 http://www.brics.utoronto.ca/docs/120329-delhi-declaration.html
22 Ibid.
in turn, somewhat resembles the experience of Brazil, India and South Africa (within IBAS) in the early 2000s, when these countries jointly created a common fund to finance human development projects and fight against poverty and hunger in developing nations around the globe. This initiative was considered as a unique political move to enhance South-South cooperation (and a precursor of further BRICS political formation), providing an alternative framework – led by emerging economies – for global financial governance.

For instance, according to the NDB’s general strategy document:

*The creation of the Bank is an expression of the growing role of BRICS and other emerging market and developing countries (EMDCs) in the world economy, and their greater willingness to act independently in matters of international economic governance and development.*

By establishing the NDB, BRICS expected to have an influence on “the international financial architecture and global practices by being a fundamentally new kind of development institution based on mutual respect and reflecting the evolution of the world economy in recent decades.” Since its inception, the NDB has approved more than 53 loans totaling about USD 15 billion to finance projects related to renewable and clean energy, transport, infrastructure, sanitation, sustainable development, etc.

In BRICS view, the NDB supplements “the existing efforts of multilateral and regional financial institutions for global growth and development” by playing a complementary role to the Bretton Woods institutions. On the one hand, while the NDB does not directly challenge the post-World War II financial order, it demonstrates BRICS dissatisfaction with the fact that global economic decision-making resides in the hands of a handful of Western powers (Maringoni & Ribeiro, 2019).

The bank, therefore, can be considered as a materialization of the BRICS discourse over the years, represented by the adoption of a “no conditionality approach” — whether political, social, or otherwise — tied to its loans (Barone & Spratt, 2015), differentiating itself from the practices of the IMF and the World bank and upholding the principle of “non-interference” in the internal affairs of recipient countries. This approach is in line with the one taken, for instance, by China, where the bank’s headquarters are located (Shanghai), since Chinese leaders believe “that every nation should have the freedom to choose its own strategy and policies for building its economy” (Xin Li et al., 2010, p. 303). Moreover, instead of a simplified “one size fits all” formula for achieving economic development, as advocated by the IMF (and discussed in the previous section of this paper), the NDB projects are “tailored to individual country needs” (Maringoni & Ribeiro, 2019), based on “democratic decision-making and inclusivity of all

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26 http://www.brics.utoronto.ca/docs/120329-delhi-declaration.html
27 The author goes on to add, “when it comes to international aid, China’s no-strings-attached approach is in sharp contrast to that of the Western powers which includes strict aid conditionality” (Xin Li et al., 2010, p. 304).
stakeholders,” placing borrowers and the bank itself on the same level of participation and promoting a dialogue of equals.

For example, the NDB states that “projects will be most successful when borrowing countries are in charge of their own development path,” without any pre-determined prescriptive policy concerning regulatory and/or institutional reforms to be undertaken by borrowing states. Another distinguishing factor surrounding the institution is its shareholding and voting rights structure. In the NDB, all BRICS countries own 20% of the voting shares, thus avoiding a situation when any single member can control the bank’s operations and decision-making (Bueno, 2019), which is one of the main criticisms directed, for example, against the IMF and the World Bank.

As regards the general perception of American/European centrism in matters related to holding high posts in global financial institutions such as the World Bank and the IMF (one of the main reasons undermining their legitimacy) that link the selection process with a certain nationality/region, the President of the NDB, on the contrary, is elected from among the BRICS members on a rotational basis, accompanied by at least one Vice President from each of the other states.

Finally, in line with the difficult developments surrounding the COVID-19 pandemic crisis worldwide, when the BRICS countries are particularly hard-hit, the NDB approved USD 3 billion in loans to Brazil, India and South Africa in 2020 to support the public health and social safety sectors of the economy and emergency assistance programs to combat the virus. This (among other things) demonstrates dynamism, flexibility, and adaptability of the NDB to prospective as well as circumstantial changes within its member states and around the world in a situation of crisis, providing an example of how the bank embodies the BRICS discourse and principles not only in regard to certain aspects of global governance in particular, but also in terms of international cooperation in general.

Conclusion

According to some analysts, BRICS is a group whose inception was largely motivated by the desire to provide a counterbalance to Western (and ultimately American) hegemony in international affairs, and whose goals include shifting from a Western-centered paradigm of global governance to a more inclusive arrangement where emerging countries could play an important role in decision-making. In this context, the establishment of the BRICS
New Development Bank in 2015 demonstrated not only the first successful attempt to institutionalize the group, but also the embodiment of the BRICS discourse and views on how financial governance should be tackled.

While, on the one hand, BRICS alludes to the asymmetric and unequal nature (pertaining to the North-South paradigm) present in the relationship between donor and recipient countries embedded in projects undertaken by both the World Bank and the IMF, the NDB promises “a new mindset of partnership,” engaging “in a dialogue of equals” with its borrowers and putting recipient countries “in charge” of their development projects.

Indeed, one of the main reasons for criticism of the Bretton Woods institutions revolve around the IMF practices, according to which borrowing states must meet certain requirements/criteria established by the Fund in order to obtain loans, frequently involving the adoption of harsh economic austerity measures that ultimately hinder domestic stability. In fact, a number of countries have unpleasant memories of the times when they were in debt to the Fund, such as Brazil, for instance. The NDB, on the other hand, promises to be a non-prescriptive institution that respects other countries’ sovereignty in regard to their sustainable development goals. Thus, instead of a “one-size fits all” approach to projects intended to stimulate economic development, the NDB emphasizes the necessity to adapt to each country’s specifics and unique domestic circumstances.

Moreover, its shareholding structure, in which each BRICS member has 20% of the voting rights, enables all countries (in theory) to have an equal voice within the institution, without any single authority that can influence the decisions and operations of the NDB without the consent of others. The bank’s approach in this regard is in sharp contrast with practices still in place at both the World Bank and the IMF, where a handful of Western states hold most of the decisive power in spite of all the other members. All the above demonstrates that the NDB’s declarations and practice not only complement the current architecture of global financial governance, but also represent an institutionalized embodiment of the BRICS discourse and principles.

References


Population trends in BRICS: Developments and projections

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State University of São Paulo;
Federal University of Rio de Janeiro (Brazil)

Abstract
The purpose of the article is to analyze population trends in the BRICS countries in the period from 2000 to 2019 based on local realities and socio-economic indexes, as well as to study projections up to 2050. The article also explores initiatives of the United Nations Population Fund (UNFPA) in the field of demographic research relevant to BRICS, such as fertility, birth, and mortality rates. Thus, it is possible to determine the main characteristics of the population of the BRICS countries, their challenges and objectives, which allow us to predict with an eye to 2050 and the dynamics of the evolution of each member of the international cooperation grouping. Overall, it is argued that urbanization processes were one of the key factors driving population trends in the BRICS countries, especially those related to lower fertility rates. Finally, the current situation of BRICS in the international scenario is evaluated, given the explored attributes, with an emphasis on the importance of public policies favorable for the full development of the potential of the BRICS population. Therefore, member states’ initiatives to promote higher levels of social welfare are investigated, as well as their benefits to local peoples, who together account for more than 40% of the world’s total population.

Keywords: BRICS, demography, population, life expectancy.

JEL: J00, J11.

Introduction
The rise of BRICS as a cooperation grouping on interstate relations highlights particular processes of socio-economic and population growth. This group differs from other countries by specific dynamics of economic growth and development, and social inequality in their historical processes. If we consider BRICS as the main emerging
countries, their developmental experiences and social characteristics are peculiar, and they differ from each other. However, in a particular historical context, these countries have similar characteristics: development and economic growth are considered equivalent and associated with reducing poverty and inequality (BRICS Policy Center, 2013).

From the point of view of development theory, BRICS is at a decisive moment: its societies and economic activity profiles are changing from emerging to developed. According to Chang (2003), the development strategy of the current protagonists of the global economy was devised, first, on the basis of state initiatives, by prioritizing public investments and shaping scientific and technological development. After this embryonic stage, these countries preached such elements of their foreign policy as economic liberalization and its consequent deregulation as a way to guarantee their entry into international markets and hinder the rise of new developing countries — possible competitors that would develop along the same trajectory.

Therefore, BRICS as a cooperation grouping in the international system faces great challenges since on a global scale there is a process of maintaining inequalities in production and technology, which demystifies liberal precepts (mainly the self-regulation of markets) and reinforces peculiarities of each country’s historical development. Thus, it is necessary to emphasize different processes and models of economic development evolving from constant interstate competitive pressure and uneven development. As a cooperation grouping on mutual assistance, BRICS seeks joint initiatives among its countries in order to strengthen each other and achieve their foreign policy goals.

As far as demographic research is concerned, BRICS is of paramount importance since despite integrating only five nations, they represent more than 40% of the world’s population, and it is expected that in 2020, these countries will host 20% of the world’s urban middle-class (Haffner & Monteiro, 2011).

Throughout the second half of the 20th century, as well as in the following decades of the current one, the BRICS countries experienced higher levels of urbanization, which affected their population trends. Urbanization — that is, the population living in towns and cities — as a process is widely seen as one of the key factors in reducing fertility rates, and, consequently, reducing population levels in future generations due to higher levels of education and services (such as contraception) provided in urban regions (Martine et al., 2013). As a theoretical reference, this article analyzes correlations between urbanization levels and lower fertility rates that result in future low population growth in the BRICS countries later in the 21st century. Despite the fact that each of these countries faces its own specific challenges, which will be discussed later, all five societies have in common a steered urbanization trend. Figure 1 illustrates the processes of urban population growth and low fertility rates in the BRICS countries that have been going on for decades.
Apart from India, which is still at an early stage of urbanization, all other BRICS countries are already highly urbanized societies (especially after the significant growth of cities in the 20th century) characterized by steady economic development.

Source: UNFPA (2019), author’s elaboration.

**Figure 1.** Evolution of urbanization rates in the BRICS countries, from 1960 to 2050 *(projections for 2019 and beyond)*

In all BRICS countries, even in India where most of the population is not urbanized, the fertility rate is estimated to be 2.1 children per woman or lower, which indicates that population is expected to decrease in future generations. Among demographics studies, there is a correlation between the urbanization rate and low fertility rate since urbanized families tend to have fewer children.


**Figure 2.** Total Fertility Rates (TFR) in the BRICS countries, from 1960 to 2050 *(projections for 2019 and beyond)*

As in their trade relations, current trends indicate mutual strengthening of the BRICS countries in the coming decades, which in relation to their demographic problems is summarized in the discussion points presented at the first meeting of BRICS Ministers
Responsible for Population Issues held in February 2015, in Brasília. The objective was to discuss relevant topics with a group equivalent to 2.9 billion people and develop a joint exchange of views on population and development issues. These topics were:

- Maternal mortality
- HIV/AIDS and sexually transmitted diseases
- Rural-urban migration and urbanization
- Aging and intergenerational transfers
- Gender differences in the labor market
- Gender equality and the role of women in caring for dependents (children and elderly) (UNFPA Brasil, 2015).

This article analyzes the most relevant demographic topics for each BRICS society, based on their specific and joint experiences and dynamics with an emphasis on the determining factors of population dynamics and social development of the member countries. The presented data, divided into sections, each dealing with one BRICS country, analyze the demographic evolution there in the period 2000–2019, establishing further trends until 2050 based on data from the United Nations Population Fund (UNFPA). All evolution data do not measure international migration flows — the so-called zero-migration variant (UNFPA, 2019) — which tend to affect the total number of migration hotspots. Therefore, all projections require constant updating — at least every decade — especially for countries with significant inflows and outflows of international migration.

1. Brazil: Aging and demographic transition

In Brazil, demographic analysis indicates considerable growth of population between 2000 and 2019; on average, about 1% per year: from approximately 170 million inhabitants in 2000 to 212 million in 2019 (Figure 3).

![Figure 3. Evolution of the Brazilian population between 2000 and 2019 (millions of inhabitants)](source)

Sources: Instituto Brasileiro de Geografia e Estatística (2020), author’s elaboration.
According to Figure 3, in addition to the decline in population growth, there is a future stabilization and reduction in the population of Brazil, a problem that will become a reality in the 2040s, according to Instituto Brasileiro de Geografia e Estatística (2020). This forecast shows an increase in the life expectancy of Brazilians: from 70.4 years in 2000 to 76.5 years in 2019; as well as a decrease in the birth rate: from 21.13 births per thousand inhabitants in 2000 to 14.2 in 2019. The following Figure 4 illustrates IBGE projections for the evolution of the Brazilian population by 2050.

![Population (in millions)](image)

*Note:* After a population peak in the 2040s, there is the beginning of a slight decline in the population.

*Sources:* Instituto Brasileiro de Geografia e Estatística (2020), author’s elaboration.

**Figure 4.** Evolution of the Brazilian population (*decades, until 2050*)

According to the graphs above, Brazilian population is at the final stage of growth, which will continue, approximately, until the 2040s, with a population peak close to 230 million inhabitants. Since then, there is a slight decrease, i.e. a higher mortality rate than birth rate per year. Therefore, it is necessary to identify the main causes for this effect: aging of the population and demographic intergenerational transition. According to Giambiagi and Pinheiro (2012), the number of children is decisive for the age groups of Brazilians: in 2050, those aged 0 to 14 will represent just over half of their number in 2010, while the elderly will triple if the same time frame is analyzed.

The demographic trends illustrated by Figures 3 and 4 highlight an unprecedented fact. This aging of the Brazilian population is accompanied by an increase in life expectancy, which is expected to be 81.2 years in 2050 (Instituto Brasileiro de Geografia e Estatística, 2020). Therefore, one of the main population challenges for Brazil is the development of public policies necessary to manage the aging of Brazilians; this mainly concerns reforms in social security and productivity growth in national economy, since further economic development will be based on fewer young workers.

Estimates made by Giambiagi and Pinheiro (2012, p. 207) indicate that in the next 40 years, Brazilian GDP per employee should increase by 3.3% annually, so that GDP per capita will also grow by 3% per year, as there is no significant growth in the economically
active population. Thus, in the case of Brazil, public policy should focus on the growth of productivity of the Brazilian economy, so that the country maintains economic development and improves the standard of living.

2. Russia: Stagnation and fecundity

Regarding the Russian population, as shown in Figure 5, there was a slight decline in the first half of the 2000s: from 146 million people in 2000 to less than 144 million in 2005; the next half showed stagnation that remained stable until 2010. In the following decade there was a slight increase in contrast to the previous one. The population estimate for 2019 is a return to the data recorded in 2001, which indicates a timid recovery. However, compared to 2000, the population of Russia is still declining, and it is also declining compared to its peak registered in 1992: 148.5 million. Therefore, Russia has been experiencing population stagnation for almost three decades.

![Population (in millions)](image)

*Note*: First there is a decline in the population, then stagnation and a slight recovery.

*Sources*: UNFPA (2019), author’s elaboration.

**Figure 5.** Evolution of the Russian population from 2000 to 2019 (*millions of inhabitants*)

According to demographic research carried out by the United Nations Department of Economic and Social Affairs, the trend from 2014 to 2050 is a continuous decline of the Russian population, mainly from the decade of 2020, as shown in Figure 6. It demonstrates the aging of the Russian society, whose average age since the same decade is more than 40 years. Therefore, from the population point of view, this is a serious problem, since the real decline is accompanied by the maintenance of fertility rates below the population replacement level set at 2.1 births per woman (United Nations. Department of Economic and Social Affairs., 2019). According to former Deputy Minister of Labor and Social Protection of Russia, Sergey Velmyaykin, the BRICS states, like Russia, have “...a wide range of problems that affect our populations, such as aging and migratory waves. Our work should seek mutual goals” (AgênciaBrasil, 2015).
Note: There is a population peak of around 146 million people in the 2020s, while in 2050, a continuous decrease to about 136 million is projected.

Sources: UNFPA (2019), author’s elaboration.

**Figure 6.** Evolution of the Russian population from 2010 to 2050 (millions of inhabitants)

### 3. India: Urbanization and growth

The Indian population, currently the second largest, continued to show record growth during the first decade of the 21st century and beyond. From 2000 to 2019, according to Figure 7, the number of Indians grew from just over 1 billion to almost 1.36 billion inhabitants, equivalent to an average of 2% per year. Despite not very high growth rates due to the size of the population, the absolute number of Indians born during

Note: The population is increasing by 2% per year, reaching approximately 1.36 billion people in 2019.

Sources: UNFPA (2019), author’s elaboration.

**Figure 7.** Evolution of the Indian population, from 2000 to 2019 (millions of inhabitants)
this period was sufficient to overcome the total Brazilian population. This highlights the challenges the country faces in terms of overpopulation and migration dynamics: currently, urbanization is equivalent to 10% of the world’s urban population divided into 35 metropolitan regions, which gives it a large margin for expansion, as only one-third of Indians live in urban areas (Sandhu, 2005).

In the post-independence period, a new model of economic activity has developed in India, concentrated in Calcutta, Mumbai and Chennai, which has led to significant social polarization and various stages of internal development. This uneven growth has resulted in overurbanization of provinces such as Chandigarh and Delhi (more than 80% of the urbanized population), which is very different from provinces like Bihar and Sikkim (approximately 10% of the urbanized population). Therefore, India’s internal dynamics and migration flows are associated with concentrated economic growth in some provinces, resulting in different urbanization patterns across the country (Sandhu, 2005).

According to UN research, in the 2020s, the Indian population overtakes the Chinese in size and steady growth to reach 1.6 billion inhabitants, while China reaches its population peak around 2030 and begins a period of decline from then on.

\[
\text{Note: The growth pace is decreasing throughout the decades; however, by absolute numbers, India is gaining approximately 400 million habitants until 2050.}
\]

Sources: UNFPA (2019), author’s elaboration.

Figure 8. The Indian population growth from 2010 to 2050 (millions of inhabitants)

4. **China: Urbanization and birth**

Over the past three decades, the Chinese population has experienced an intensive urbanization process stimulated by vigorous industrialization. According to the Chinese National Bureau of Statistics (NBS), its urban population reached 60% in 2019; since 2012, most Chinese live in urban regions (Xinhuanet, 2020). As illustrated by Figure 9, more than 848 million Chinese are living in cities.
Note: Chinese authorities claim that over 60% of the population lives in urban areas, which is equivalent to more than 800 million inhabitants.

Sources: UNFPA (2019), author’s elaboration.

Figure 9. Evolution of the Chinese population from 2000 to 2019

The growth of the Chinese urban population occurred at a time when the “one-child policy” was enforced in the cities. The official family planning policy, known worldwide as the “one-child policy,” was announced on January 1, 1979, in response to China's serious demographic problem of overpopulation. Families were allowed to have only one child, both in rural and urban areas, and thus they received an “only child certificate.” To ensure effectiveness in practice, every fertile couple had public access to contraception.

While criticism of such drastic methods was high in the early years, there were changes in strategy since the second half of the 1980s. To prevent this policy from completely failing in rural China, which strongly opposed strict compliance with such measures, some exceptions were created to make it more pleasant: authorizations for the birth of a second child for rural families with a daughter as the first child, as well as in urban areas if the first child was disabled or died; rural minorities were allowed to have two children, but government surveillance was not applied in the same way as to the Han, the broad ethnic majority in mainland China, being less strict to the former (Gomà, 2011).

As in the 1990s, since 2001, family control policy was further strengthened, both in relation to inspection officers and official propaganda and in relation to legal regulations, despite the satisfactory results in maintaining the total population below 1.4 billion until 2010.

However, in October 2015, the CCP announced that it was ending support for the so-called “one-child policy” that had been initiated 35 years earlier. In the five-year plan for 2016–2020, this measure was replaced by another “…that allows each couple to have two children as a proactive response to the aging of population” (Domingo & Pérez, 2016). As stated above, in response to the rapid aging of the population, birth control came to be seen as a threat since the fertility rate fell sharply over several decades: from about 5.5 children per woman in 1970 to just over 1.5 children in 2010.
In response to the increase in the number of elderly people over 64, who represent 17% of the Chinese population, the national government has renounced the “one-child policy” as an attempt to maintain a stable population level and delay its decrease, which seems inevitable due to the continuous improvement of sanitary conditions, life expectancy, currently close to 80 years, and the fall in the fertility rate (Domingo & Pérez, 2016).

This birth control proposal by the Chinese Communist Party prevented the birth of approximately 400 million Chinese since the 1980s, which contributed to a premature decline of the economically active population, which registered its first drop of about 3.5 million in 2012 (Agência Lusa, 2013). These restrictions, due to the accelerated aging process of Chinese society, were revised in order to allow the Chinese youth population to grow again.

Figure 10 allows to identify the government’s goals for changing birth policies by observing a decline in the Chinese population starting from 2030.

Note: The Chinese population peak is expected in the 2030s, followed by a sharp decrease in the following decades. In order to try to reverse this trend, the CCP proposed a revision of the strict birth control policy in urban zones.

Sources: UNFPA (2019), author’s elaboration.

Figure 10. Evolution of the Chinese population from 2010 to 2050

5. South Africa: Maternal mortality and HIV

The main population problems in South Africa are related to sexually transmitted diseases, especially HIV, and the high maternal mortality rate — 119 maternal deaths per 100 thousand births in 2017. As for HIV, it is a recurring theme in public health policies; South Africa is considered the country with the highest number of people infected with HIV — approximately 7.7 million in 2018, equivalent to 20% of the adult population. The epidemic is an important factor in the mortality structure of the country, while HIV-related deaths account for about a quarter of all deaths in the country. Therefore, despite
the young population, mortality is also high, which affects the low life expectancy in South Africa, estimated at 64 years (Central Intelligence Agency, 2020).

Note: During the first two decades of this century, there has been a stable and gradual growth due to high mortality rates, despite the young population — 27.9% under the age of 14.

Sources: UNFPA (2019), author’s elaboration.

Figure 11. Evolution of the South African population from 2000 to 2019

South Africa’s population continues to grow steadily over the next decades, while trends indicate annual growth rates below 1%. Therefore, the same current population challenges of the country remain equally relevant for the public policy in the long run. As shown in Figure 12, South Africa’s population will exceed 60 million in the 2030s and will continue to grow gradually, approximately, by 25 million over four decades.

Note: There is a gradual increase, but it is characterized by persistently high mortality rates combined with a relatively low life expectancy of 64 years in 2020.

Sources: UNFPA (2019), author’s elaboration.

Figure 12. Evolution of the South African population until 2050
Final considerations: BRICS on population issues

BRICS, a cooperation group formed by major emerging economies, has the potential to become one of the main forums for discussing population issues, as the countries bring together a group of more than 3 billion inhabitants — equivalent to approximately 40% of the world’s population — and economic and demographic factors are seen as an opportunity for sharing experiences and cooperation (UNIC Rio de Janeiro, 2015). Due to the common trends in urbanization levels and declining fertility rates among emerging countries, BRICS as a group has a potential to cooperate on population issues, as well as exchange experience and address challenges on previously established priorities. Forums promoted with the support of the United Nations Population Fund (UNFPA) jointly discuss issues relevant to BRICS: maternal mortality, HIV and sexually transmitted diseases, urbanization, aging, and others. Therefore, according to Benoit Kalasa, director of the Technical Division of UNFPA, “…the benefits and potential of BRICS experiences are evident in many areas, especially on population” (UNIC Rio de Janeiro, 2015).

Furthermore, based on such exchanges, BRICS experts can discuss gender issues, such as efforts to ensure equality in labor market and gender equality. Such debates, according to Brazilian diplomat Carlos Paranhos, are important, because “The dialogue between BRICS countries is essential to better protect and promote the rights of all population groups, guaranteeing our populations higher levels of economic and social welfare” (BRICS Civic Forum, 2015).

A commitment to mutual cooperation in BRICS is essential to implement a unified policy to overcome the challenges that exist in each country. A single platform for discussions and exchange of information and experiences on population issues allows the member states to mutually strengthen the protection of the rights of their populations, so that economic development ensures a higher level of social welfare of their peoples.

References


Bibliometric analysis of the most cited articles in BRICS research

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Abstract
Bibliometric analysis identifies the most impactful and prolific journals, authors, countries, and institutions by assessing the most cited articles in a specific research area. The aim of this study is to analyze and to provide a scope of modern scientific products related to BRICS. The 100 most cited articles related to the BRICS research were retrieved from the study “(BRICS)” in the Scopus database. The variables collected and included in this analysis are: number of citations, article title, first author’s name, year and journal of publication and its impact factor, theme and country mentioned in the database at the time of publication, and category of the paper (original article or review).

Keywords: BRICS, bibliometric analysis, impact factor.

JEL: Z00.

Introduction

BRICS is a group formed by five developing countries — Brazil, Russia, India, China, and South Africa. Together they make up 42% of the world’s population and contribute to 23% of the world’s gross domestic product. It was designed in 2001 and launched in 2006 (Mielniczuk, 2013; Gammeltoft, 2008).

Although all BRICS member countries provide significant contribution to all fields of science and encourage research, to the best of the authors’ knowledge, the academic impact of research concerning the aspects related to BRICS itself was never assessed. Brazil, Russia, India and China have been promoting their consolidation as a political

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group since 2006. The citation rate of articles can be used to estimate the impact of a given research in a specific field. Moreover, many metrics of individual authors and journals depend on the number of citations. Examples include a journal’s impact factor (IF), Scimago journal rank, and others. Assessing the most cited articles in a specific research area is important in terms of determining the most active journals, authors, countries, institutions, and specialties, covering the scope of the research field in question (Noyons et al., 1999; Garner et al., 2017).

This paper aims to evaluate the impact of the available research in this field, as well as scrutinize tendencies related to the presented variables.

1. Methodology

1.1. Search protocol

The 100 most cited articles in BRICS research were identified through an analysis in Elsevier’s Scopus in September 2020. The string we searched for was “(BRICS).” The articles were arranged from a higher to a lower number of citation, and the 100 most cited were exported and analyzed. No other restrictions were adopted. The 2019 IF and the 5-year IF of the most cited journals were retrieved from the InCites Journal Citation Reports (JCR) website (https://jcr.incites.thomsonreuters.com/) in October 2020.

1.2. Bibliometric analysis

From the 100 most cited papers, the following variables were collected and included in this analysis: number of citations, article title, first author’s name, year and journal of publication and its IF, category of the article, and issue of the paper. We obtained the average number of citation out of the 100 most cited papers using Microsoft Excel. We classified the articles into primary research and secondary research.

2. Results

2.1. Overview

Our search resulted in 2326 articles in the Scopus database. The average number of citations was 62.48, ranging from 37 to 209. The ten most cited publications ranged from 103 to 209 citations (average = 138.3). The most cited article was a literature review published in 2014 in the journal named Renewable and Sustainable Energy Reviews by Sebri et al., Egypt, which had 209 citations. When analyzing only original articles, the average number of citations was 60.73, ranging from 37 to 174. The most cited paper
among the original articles was published by W. N. Cowan et al. in *Energy Policy* in 2014, it accounts for 174 citations. As for review articles, the greatest number of citations was from W. Mensi, who was also the first in the overall analysis — 234 citations. The complete list is provided in Appendix (Table 1.1).

### 2.2. Journal and IF analysis

In total, 64 different journals were represented when publishing the 100 most cited articles. The list with the number of articles in the top 100, the number of citations and IF for the ten most cited journals is provided in Appendix (Table 1.2). Among the 100 most cited articles, 43 were from the ten most cited journals, accounting for 2,697 of the total 6,258 citations. *Third World Quarterly* and *International Review of Financial Analysis* were the journals with the highest numbers of articles, both with 6 articles in the top 100. However, regarding the number of citations, *Third World Quarterly* led with 423 citations. There were 6 journals with no impact factor (*International Journal of Business Science and Applied Management*; *International Journal of Technology and Globalization*; *Strategic Narratives: Communication Power and the New World Order*; *Global Finance Journal*; *World Patent Information*; and *American Foreign Policy Interests*). The IF was not used for reports presented at conferences, in books, etc.

### 2.3. Country analysis

The 100 most cited papers were published by institutions from 27 different countries. By far, China was the country with the most published documents, with 22 papers out of the top 100 and the most cited — 1,286 citations. After excluding secondary research, China remained the most prolific (20 articles in the top 100), as well as the most cited country (1,200 citations). The second country in terms of the number of articles was the United Kingdom (14 articles), as well as in the number of citations (828). For the complete list of the publications and citations by country, see Table 1.

**Table 1.** Number of documents and citations by country

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2.4. Year analysis

Articles were published from 2006 to 2020, and, with the exception of 2009, these publications occurred every year. 2013 encompassed the largest number of citations (1218) and articles (20) in the top 100. The second largest number of published papers was in 2016 (15 papers), and the second largest number of citations was in 2014 (1,121). See Table 2, 3 and Figure 1.

Table 2. Documents and citations by year of publication

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Table 3. Type of publication by number of documents

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Figure 1. Documents and citations by year of publication. The continuous line indicates the number of publications in the top 100, and the dotted line — the number of citations

2.5. First author and article category analysis

The first author with the highest number of citations and articles in the top 100 was W. Mensi (2 articles and 234 citations). 5 most prolific authors were published, each one
with 2 documents — Z. Wang, W. Chkili, Q. Ji, C. Ban, and W. Mensi. The h-index among the ten most cited first authors varied from 1 (W. N. Cowan) to 34 (M.-L. Song). For the complete list, see Appendix (Table 1.1).

3. Discussion

3.1. Findings

Bibliometric analysis is useful for assessing the most active journals, authors, countries, institutions, and specialties in a particular field of research. In our case, studies of this kind can be performed to evaluate the scientific output of our countries in terms of their socio-economic development.

The findings of this bibliometric analysis show that China provides a large amount of impactful publications related to BRICS and is the most prolific country in this regard. Therefore, China comprises the largest number of publications in the top cited BRICS research and, as mentioned above, the highest number of publications overall. Next in the list among the BRICS members with the highest number of citations is South Africa (365 citations and 5 papers), India (135 citations and 2 papers), and Brazil (129 citations and 3 papers), respectively. Russia is not listed in the rank. Although the total number of publications with significant repercussions, if measured by the number of citations, by BRICS members represents just 30.65% of the rank.

The term “impact factor” designates statistics commonly used as an indirect indicator of the quality of research. It is calculated using the total number of citations of articles (numerator) and the total number of published articles (denominator) in a particular journal over a certain period of time. There is also another available form of the IF that is derived from the last five years (5-Year IF), which is usually more stable than the first one (Dong et al., 2005). In this study, we present a bibliometric analysis of the impact factor of journals that published the most cited articles on the topic of BRICS. Our findings show that the largest number of publications out of the top 100 were published in less than 10 journals. But only 3 of them were published in journals with an impact factor higher than 10 (The Lancet, Nature Climate Change, and Renewable and Sustainable Energy Reviews).

In addition, this pattern varies in the total number of citations on all subjects, as shown in the Scimago Journal & Country Rank (https://www.scimagojr.com/countryrank.php). According to that ranking, China is the 2nd most cited country, followed by India (9th), Russia (12th), Brazil (15th), and South Africa (34th), respectively.

As expected, we demonstrate that the majority of the most cited articles in this field were published after 2013 (78 out of 100 articles), which accounts for 4970 out of the total number of citations from the 100 most cited papers, showing the highest number of papers published in 2013 (20% out of 100 articles). However, after 2013, the number of articles and citations decreased over time, reaching another, but lower maximum in 2016. But after that, their number decreased significantly and constantly. The initial metric for a particular author is his or her number of citations. However, an author may have a high
citation number with only a few papers, without being cited in many other articles. The h-index, in turn, is a metric that combines both the author’s number of publications and the number of citations, considering, theoretically, the quantity and quality of research performed by the author. Among the ten most cited authors in the BRICS research, two authors had an h-index higher than 30: M.-L. Song = 34; S. M. Borras Jr. = 33.

3.2. Strengths and limitations

In this study, we assessed information regarding the 100 most cited articles in the BRICS research. These include the number of citations, first author’s name, year and journal of publication, country and affiliation of the corresponding author at the time of publication, and category of paper (review or original article). For each variable, we evaluated the number of documents in the top 100, as well as the number of citations. However, this study has some limitations. Since the information was retrieved from a single database (Scopus), some articles may have been omitted and the number of citations underestimated — although the authors believe that this is unlikely to occur. Indeed, Scopus covers more than 36,000 journals (data retrieved from https://www.scopus.com/sources), including Medline and Embase-indexed journals. This is a significantly broader coverage than the approximately 21,000 journals covered by the Web of Science Core Collection (WoS), for instance (data retrieved from https://clarivate.libguides.com/webofscienceplatform/coverage). In addition to that, Scopus found approximately 93% of the citations by WoS. Despite having more sources than Google Scholar, between 48% and 65% of the citations found by Google Scholar alone were from a non-journal source. In addition, documents submitted by Google Scholar had a less scientific impact and were less cited than sources that were also present in Scopus or WoS, which suggests that Google Scholar’s greater reach is mainly related to low-impact sources. These facts led the authors to choose the Scopus database (Martín-Martín et al., 2019).

Moreover, when evaluating the number of citations by the year of publication, the authors found out that more recent papers contained a fewer number of publications. Probably, this occurs because these papers will be cited in the following years. Another limitation is that some authors may belong to multiple affiliations, which may contribute to both overestimating and underestimating these variables.

Conclusions

We conduct a bibliometric analysis to assess the impact of BRICS-related research in the literature to date (October 2020). Our analysis shows that the research in this field has recently become much more active and touches on various issues. China is, by far, the most impactful country in the world regarding the research in this area. Of the BRICS countries, only South Africa and China are among the 10 most cited publications. Further research in this specific field is encouraged, mainly in the BRICS countries themselves, as they have particular insights and perspectives on their own reality and, consequently, can more accurately indicate the main problems to be analyzed.
References


Appendix

Table 1.1. Number of documents and citations by author

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<th>Author’s name</th>
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