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Sanctions, cooperation, and innovation: Insights into Russian economy and implications for Russian firms

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Abstract
The aim of this paper is to reveal the effects of sanctions at the firm level, with the special attention to cooperation and innovation activity of sanctioned firms. Specifically, the differences between domestic and international companies in their ability to adapt to the sanctions in terms of their cooperation with partners and capability to innovate are discussed.

The study argues that firms operating in international markets tend to prioritize product innovation and entering new markets to overcome negative consequences of sanctions. In addition, they are more likely to improve their products and to find new markets to compensate for losses and fill their unused capacities.

An important finding having both managerial and political value is that operating in the international market may not necessarily provide an advantage in terms of new partners in the local market but rather facilitate the search for new foreign markets. Inviting the government to provide assistance for Russian domestic and international firms on an equal basis, we admit that with varying degrees of control and interest in national firms, the Russian government can help sanctioned companies in different ways, regardless the scale of their internationalization.

The study contributes to the literature on the impact of economic sanctions at the firm-level and in the context of the domestic market of the sanctioned country.

Keywords: economic sanctions, international firms, cooperation, innovation, Russia.

JEL: F02, F23, F42.

Introduction
Economic sanctions are a foreign policy instrument commonly used by governments to influence the decision-making process of other countries (Oxenstierna & Olsson, 2015).

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There are consolidated studies on the effects of sanctions on the macro level, but with the new realities of the last decade of the 21st century, the impact of sanctions on organizations attracts more attention. In the context of the transition from global economic sanctions deteriorating the living conditions of innocent citizens to “smart” sanctions targeted at selected individuals, organizations, and sectors (Ahn & Ludema, 2020), the importance of understanding their consequences for companies has increased significantly.

Companies operating under sanctions seek to mitigate their negative effects. Understanding the impact of sanctions on different types of companies would shed light on how companies should react to sanctions and how they can leverage their international operations, which were not profoundly studied before in the business and management literature.

In order to fill the respective research gap, this paper aims to discuss the consequences of sanctions at the firm level, with special attention to the implications for cooperation and innovation of sanctioned firms. Specifically, the differences between domestic and international companies in their ability to adapt to sanctions in terms of their cooperation with partners and attitude to innovations are discussed. The study argues that firms operating in international markets tend to prioritize product innovation and entering new markets to overcome the negative consequences of sanctions. In addition, they are more likely to improve their offers to clients and find new markets to compensate for losses and fill their unused capacities.

1. **Impact of economic sanctions on countries and organizations**

Economic sanctions are a foreign policy instrument commonly used by the West to express disapproval of countries that violate international law (Oxenstierna & Olsson, 2015). Sanctions usually lead to a country’s withdrawal from customary trade and financial relations for the purposes of foreign and security policy.¹ They can also be used by countries to penalize nation states, institutions, or individuals who do not follow the rules or agreements between the nations (Lin, 2016). Economic sanctions may include all measures that do not involve the use of armed forces and that are applied to give effect to decision-making. Specific measures are chosen according to the pursued goal and can range from comprehensive economic and trade sanctions to more targeted measures, such as travel bans and arms embargoes. Economic sanctions can also be divided into two major groups — individual sanctions and sectoral sanctions (Milutina, 2018). Individual sanctions are restrictive measures that are imposed on certain groups of people or companies, while sectoral sanctions are imposed on certain sectors of a country’s economy.

The effect of sanctions can be analyzed at the organizational (firm) and global (country) level. The major studies devoted to the analysis of sanctions’ effects are conducted at the global level. This is due to the difficulties of selecting and extracting data sufficient to

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¹ https://www.cfr.org/backgrounder/what-are-economic-sanctions
conduct an analysis at the firm level, mitigate the impact of other factors, and generalize the results due to the very individual nature of each case. Additionally, the major focus of the economic sanctions of the previous decades was on global measures.

In addition to the fact that economic sanctions lead to unfavorable economic circumstances for the targeted country, they can also result in serious conflicts and wars. The most discussed examples of economic sanctions include those against Cuba in 1960, Iran in 1979 and 2003, Iraq in 1990, North Korea in 2006, Russia in 2014, and Venezuela in 2018. A common trait of imposing economic sanctions is a comprehensive trade embargo. However, the goal pursued and results are different in each case.

The following examples present the evolution of measures applied by some countries to sanction others and prove the current trend on using *smart sanctions* (Ahn & Ludema, 2020). The significant deterioration of the impact of previous methods of sanctioning on the population as a whole and the lack of successful results in achieving the primary goal have led to the popularity of smart sanctions targeting individuals, entities and sectors while minimizing collateral damage. The nature of sanctions at the entity level (individuals and organizations) has emerged as a leading policy in the last two decades, but has not received due attention among scholars.

2. **Retrospective and specifics of economic sanctions imposed on Russia**

The geopolitical conflict between Russia and Ukraine triggered the condemnation of the international community, which later led to the imposition of a range of sanctions against Russian individuals, entities, and sectors by the United States (US), the European Union (EU), and several other states. Although the actions were imposed after Russia’s annexation of Crimea, the US authorities claim that the reason for sanctions is Russia’s international behavior, specifically, interference in elections, malicious activities in cyberspace, human rights violations, the use of chemical weapons, proliferation of weapons, illicit trade with North Korea, and support for Syria.²

Since March 2014, the US, the EU and their allies have been progressively introducing restrictive measures against Russia. One way to look at these sanctions is to consider them in accordance with the implied measures (Christie, 2016). Firstly, the sanctions limit access to foreign capital for designated Russian companies in the banking, defense, and energy fields. Secondly, they restrict the import of high technologies in the oil explorations and production sectors. Finally, they are imposed in the form of an embargo on the export of certain military and dual-use goods to Russia.

The sanctions against Russia can also be analyzed by splitting them into two groups: sanctions against individuals and entities, and sectoral sanctions (Milutina, 2018). The first group is characterized by sanctioning people who threaten the political stability and

² [https://crsreports.congress.gov/product/pdf/R/R45415?__cf_chl_jschl_tk__=pmd_xm3E5aXoYwSF5CxlW K5VCjQdVjlfIK291dHJVkEyApM-1632391569-0-gqNtZGzNAiWjcBszQhR](https://crsreports.congress.gov/product/pdf/R/R45415?__cf_chl_jschl_tk__=pmd_xm3E5aXoYwSF5CxlW K5VCjQdVjlfIK291dHJVkEyApM-1632391569-0-gqNtZGzNAiWjcBszQhR)
integrity of Ukraine. This group implies a restriction on entry for persons included in the above-mentioned list, freezing of their assets, and a ban on business relations. The second group is sectoral sanctions, which limit the ability of major banks and companies in Russia to receive foreign financing. This group is mainly aimed at jeopardizing the sectors of the Russian economy. Key figures and industries in Russia are facing much more stringent and unpredictable conditions than ever before (Gould-Davies, 2018).

Companies directly or indirectly owned by people who were involved in the conflict in Ukraine faced limited access to capital markets, export bans and restriction on certain technologies and services. If a person subject to sanctions owns more than 50% of the entity, the company also becomes the target of sanctions. The US Department of the Treasury’s Office of Foreign Assets Control (OFAC) prohibits any transactions with persons (state officials, heads of key state companies and major private companies) and entities designated in the Specially Designated Nationals and Blocked Persons List (SDN List). The EU also imposed different types of restrictive measures on individuals and companies, which began with the first travel bans and asset freezes on March 3, 2014. However, in contrast to the US, which targets foreign entities that violate US sanctions against Russia, the EU sanctions against Russia apply only to EU citizens and EU-registered companies. The EU imposed restrictions on economic relations with Crimea and Sevastopol through bans on import and export of goods, restrictions on trade and investments, as well as a prohibition on providing tourist services in these locations. The negative effect of the economic sanctions on trade depends on the level of involvement of countries as a whole (Caruso, 2005). That is why the countries imposing sanctions are trying to engage more countries to participate. For example, the United Nations (UN) sanctions are considered to have a stronger adverse effect than the unilateral US sanctions (Neuenkirch & Neumeier, 2015). Given the US persistence in increasing the severity of the sanctions against Russia, a long-term and constantly growing scope of sanctions was expected.

The second group of economic restrictions is sectoral sanctions. On July 16, 2014, OFAC created a new Sectoral Sanctions Identifications (SSI) List, which authorized sanctions against certain sectors of the Russian economy, including financial services, energy, mining, as well as defense and related materiel sectors. It restricts short-term financing to the financial services and energy sectors (and has since further tightened the permissible loan maturity to 14 days for financial services and 30 days for energy). The sectoral sanctions imposed by the US and the EU include limited access to the EU’s primary and secondary capital markets for certain Russian banks and companies, as well as some sensitive technologies and services that can be used for oil production and exploration, a ban on the export and import of arms trade, and a ban on the export of dual-use goods for military use or military end users in Russia. In 2017, the sectoral sanctions

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against the railway, metallurgical and mining sectors were imposed in accordance with the Countering America’s Adversaries Through Sanctions Act (CAATSA).

In addition to direct sanctions against individuals, organizations and sectors, there are measures that deteriorate international cooperation. Countries introduce various diplomatic measures and restrictions on economic cooperation with Russia and its entities. For example, the EU-Russia summit in 2014 was canceled and a G7 meeting was held in Brussels instead. New agreements between the EU and Russia, as well as negotiations on Russia’s joining the Organization for Economic Cooperation and Development (OECD) and the International Energy Agency (IEA) were suspended (Council of the European Union, 2019).

According to numerous experts and policy-makers, sanctions will continue to strengthen. While the EU states that Russia must fully implement the Minsk agreements in order to lift the sanctions, the US demands are less obvious. On April 6, 2018, the US launched another wave of sanctions, designating the reason as “in response to worldwide malign activity.”5 The Treasury Department added that “Russian oligarchs and elites who profit from corrupt system will no longer be insulated from the consequences of their government’s destabilizing activities.”6 Thus, it is unclear what actions Russia can take, in particular, in order for the sanctions to be lifted. Moreover, while the EU needs to unanimously extend the sanctions every six months, the US has passed the law named Countering Russian Influence in Europe and Eurasia Act of 2017 (CRIEEA) which transfers substantial powers to impose, ease and lift sanctions from the President to Congress. Russia was exempt from the Jackson-Vanik amendment, which affected the US trade relations with countries with non-market economies which restricted freedom of emigration and other human rights, only for 38 years (Gould-Davies, 2018). The cases of the US sanctions against Cuba and Iraq show that economic restrictions can remain imposed for decades if the targeted country resists meeting the requirements. Potential negative harm to Cuba was mitigated with the help of the Soviet Union. The confrontation and the lack of interaction between the market and planned economies also reduced the effect of sanctions imposed by the US against Cuba. In the current context of globalization, economies are more connected and negative effects of isolation are much stronger. Given the high complexity of the process of lifting sanctions by the US authorities, no changes can be expected in the short run.

While sanctions are popular restrictive measures and are commonly applied against post-socialist countries, the sanctions imposed in 2014 represent the first such case since the Cold War and the collapse of the USSR in 1991 (Oxenstierna & Olsson, 2015). The example of the introduction of the current economic sanctions against Russia is comparable to other comprehensive sanctions programs, e.g. as in the cases of Iran and Cuba, although there are certain complexities that should be emphasized in the case of Russia, for instance, turning sanctions against Russia into a law, introducing a new type of

5 https://crsreports.congress.gov/product/pdf/R/R45415?__cf_chl_jschl__tk__=pmd_xm3E5aXoYwSF5CxfWKS5CjQKdVlJK291dHJVkEyApM-1632391569-0-gqNtZGzNAiwcnBszQhR
6 Ibid.
sectoral sanctions that were not frequently used before, and stating unclear conditions for lifting the sanctions. It is also obvious that the United States limit the options for Russian companies to perform successfully on the global arena. However, being a more significant partner for Russia, the EU is in no hurry to terminate all economic contacts with Russian entities. Still, while the EU lost less than 0.2% of its value added and employment from 2014 to 2017, Russia’s GDP fell by 2.4 percentage points (Gurvich & Prilepskiy, 2015). The situation is unlikely to change in the near future, and Russian companies need to be ready to respond to the intensified economic sanctions.

The economic sanctions against Russia could not remain unanswered. It is interesting that the groundwork for Russia’s *countersanctions* was laid in January 2010 when the food security doctrine was signed (Korhonen et al., 2018). This program sets targets for domestic production of basic foodstuffs, such as potatoes, dairy products, grain, and meat. It was formulated in the action plan, Agricultural Development Program 2013–2020, in 2012, and also extended to other sectors within the framework of the “Government Program on Industries and Competitiveness” in April 2014. The first trade restrictions with the US were introduced in December 2012, after the Sergei Magnitsky Act, limiting the maximum possible amount of imported beef, pork, and poultry. Later, when the act became the law, the Russian parliament also voted to ban the adoptions of Russian children to the United States and extended sanctions to travel prohibitions for certain citizens. After the Ukrainian crisis, the economic countersanctions intensified against more individuals and banned the import of agricultural products from countries imposing sanctions on Russia, starting with the EU, the US, and Turkey in July 2014. The Russian government began to introduce different measures to decrease the import-dependence in different fields, for example, in the mining industry (Vorotnikov et al., 2019).

Since the introduction of Western sanctions, Russia has started investing in the upgrading of its sanctions defenses (Kluge, 2019). The government develops its sanctions policy in such a way as to minimize costs for domestic interest groups, including organizations (Bělín & Hanousek, 2021). In addition to the import substitution policy, it has established a national payment system and a respective credit card “Mir.” A specialized bank without the US exposure was created to serve sanctioned firms — Promsvyazbank, which removes “toxic” assets from the balance sheets of banks with the extensive international operations. The introduction of a floating exchange rate of the Russian ruble in November 2014 served as a buffer against sanctions related risks, and the devaluation of the currency helped the Central Bank to replenish its reserves. In addition, sanctions and strained relations with the US led to mutually expelling mission personnel and closing of consulates and chanceries. In April 2018, President Putin signed a law authorizing restrictions related to trade with the US and other unfriendly countries, as well as banning foreign access to Russian public procurement and privatization.

The effect of economic sanctions is a complicated indicator to measure. It is very difficult to disentangle the impact of sanctions from other factors influencing the ultimate

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7 Ibid.
8 Ibid.
socio-economic environment. The cumulative effect of fluctuations in oil prices, which is the main export product and a source of revenue for the Russian government, as well as underperformance of the Russian economy, political uncertainty, and economic sanctions led to a deep recession in 2014–2015 and a number of serious problems, such as the depreciation of the Russian ruble, inflation, collapse of investor sentiment, falling of foreign exchange reserves and an increase in the budget deficit.\(^9\) Several studies even claim that the negative impact of low oil prices on the Russian economy is three times greater than the effect of sanctions (Stout, 2017; Korhonen et al., 2018; Kholodilin & Netsunajev, 2019). It also significantly reduced the purchasing power of the population (Christie, 2016). However, the rise in oil prices in 2016 helped the economy to exit its two-year recession.

Therefore, even with many other factors determining the unfortunate situation in the Russia’s economy, the effect of sanctions cannot be neglected. First, there is a significant negative effect of economic sanctions in the long run (Mirkina, 2018). This decreases the trade flows and deteriorates other economic outcomes, such as policy indicators or consumer welfare (Bělín & Hanousek, 2021). Secondly, sanctions create new realities in which companies need to operate. For example, it is expected that restrictions on access to Western technologies will impede the modernization of Russian oil companies.\(^10\) According to policy-makers, Western sanctions will dry up foreign investment and credit, hitting large and small businesses in the short run, and will cost Russia’s economy 0.2% of annual economic growth in the long run due to lost business opportunities, underinvestment in infrastructure, and a slowdown in modernization.\(^11\) Thirdly, the analysis of various cases of sanctions imposition and the opinions of experts raise concerns about the possibility of lifting the sanctions in the short term. The head of the International Department of the Russian Energy Ministry, Roman Marshavin, said at the Fort Ross Dialogue conference in May 2018 that “US sanctions against Russia, Iran and Venezuela have an economic subtext, and are, in essence, part of a struggle for the global gas market” (Interfax, 2018 May 23). All the above supposes that the sanctions can last for a long time. Finally, given the fact that sanctions are most likely to be effective when they are multilateral, comprehensive, and target a regime that is economically vulnerable (Hufbauer et al., 2007), it is expected that tougher measures will be applied by different players, and more industries will be subject to sanctions.

3. General consequences of sanctions

Smart sanctions, which are currently a very popular tool of international policy, led to a strong negative effect on individuals and entities of the Russian economy. One fifths

\(^9\) Ibid.
\(^10\) Ibid.
of the 100 largest firms in Russia are direct subjects of the US sanctions. They have already lost on average about a quarter of their operating revenues, more than half of their asset values, and about a third of their employees compared to their non-sanctioned counterparts (Ahn & Ludema, 2020; Stout, 2017). In this context, it is very important not only to analyze the global effects of sanctions, but also to consider the consequences for the country’s domestic and international firms.

Given the evidence that domestic companies lag behind their international counterparts in terms of performance and competitiveness (Shukla, 2015), it would be worthwhile to compare the two groups of firms’ ability to resist the negative impact of sanctions. For example, exporters are more capital-intensive, productive, and able to survive downturns in the economy than non-exporters (Cassiman & Golovko, 2010; Fernandes & Isgut, 2015; Puig et al., 2014). They have easier access to knowledge and information from foreign markets, which, in turn, may result in enhanced innovations, reduction of costs and improved quality of products (De Loecker, 2007; Ermolaeva et al., 2018). By contrast, domestic corporations may have better risk-adjusted market performances than multinational corporations (Michel & Shaked, 1986).

By choosing the method of product innovations within or outside the company, the organization can significantly reduce the costs of operations, thus improving its market position. Additionally, business model innovations are crucial for success in unsettled markets where traditional revenue and pricing models are not applicable (Teece, 2010). Business model innovations are tightly coupled with the opportunities that exist for the companies and can assist them in finding new partnerships.

Russian sanctioned firms experience significant limitations in access to suppliers, financial resources, customers, and technologies. They are also restricted in creating new partnerships, which, in turn, pushes them to accept the assistance of the government (Panibratov & Michailova, 2019). Previous collaborations enhance the adaptability of alliances: companies foster their own current cooperation with established partners (Bělín & Hanousek, 2021). Moreover, companies that operate in foreign markets are expected to have less difficulties in overcoming obstacles stated above and, therefore, experience fewer negative effects from the sanctions compared to companies operating only in the domestic market. Access to international markets increases their chances of finding a substitution for the no longer available resources and partnerships, thus improving their resistance to the unfavorable economic situation in the country.

The main consequences of sanctions can be grouped into two clusters: cooperation and innovations. The first group, cooperation, can be viewed through relations with suppliers, customers, financial institutions, and the government. The loss of certain partnerships is expected to push the company to look for new agreements in Russia and abroad. The government also plays a significant role in mitigating the effects of economic sanctions. It can provide direct support to the company (e.g. governmental orders, subsidies and loans), as well as create an environment in which the company compensates for losses through entering new agreements. The deterioration of international cooperation is expected to have a long-term effect on the performance of the company and lead to entering a new agreement.
The second group, innovations, is represented by changes that happen to the company in the field of innovations: product innovations, business process innovations, and the internal environment of the company influencing the creativity of employees. This aspect of Russian companies’ activities is significantly influenced by sanctions due to restrictions on the import of technologies and concurrent import substitutions policies. Innovations are globally recognized as one of the main tools for improving competitiveness of the company. During economic sanctions, innovations can become a source of mitigating negative effects and increasing productivity. In turn, employees make a significant contribution to the company’s success, and their creativity can become a source of future improvements. These two groups of changes are discussed in the latter part of the paper on the example of Russian firms.

4. Prospects of cooperation

One of the most affected aspects of a company’s activities during sanctions is cooperation with foreign partners: suppliers, customers (Ahn & Ludema, 2020), and investors (Mirkina, 2018). The role of the government is also subject to changes during sanctions, as it starts to play a significant role in mitigating the effects of the sanctions on companies (Gibson, 1999). Since 2014, Russian companies have also been facing new realities that force them to quit partnerships. Companies are entering new local and foreign markets to mitigate the negative effect of lost agreements (Golikova & Kuznetsov, 2017). They also need to look for new partnerships in the field of supplying good and services in Russia and abroad (Vorotnikov et al., 2019). In addition, the economic sanctions have cut off Russian companies from the global economic and financial system (Gould-Davies, 2018). Companies are isolated from global payment systems and have difficulties obtaining credit lines. In its turn, the government is introducing new mechanisms to help companies overcome the consequences of the sanctions, such as facilitation of the issuance of loans or tax reduction. Companies often turn to the government for help in acquiring and managing resources (Panibratov, 2016), stimulating innovations (Chandran et al., 2013), and creating an environment that allows them to build new partnerships. During the period of sanctions, the role of the government increases dramatically.

The reverse effect of economic sanctions encourages companies to find new suppliers, customers and investors and to form new agreements (Milutina, 2018). New partnerships can be established both within the state border and in other markets. Moreover, previous collaborations can enhance network adaptability (Bělín & Hanousek, 2021). Companies are trying to mitigate the negative effect of the sanctions on alliancing capacity via indirect exports through the nearest neighboring countries (Crozet et al., 2021). The priority markets for Russian companies during the sanctions are the BRICS countries, the EAEU, as well as Central and Southeast Asia (Babkin & Baikov, 2017). Government agreements between Russia and other countries that are “neutral” in relation to sanctions or a part of “neutral” states facilitate the process of building new or alternative business relationships.
Although partnerships can become a reliable alternative to a deteriorated business relationship and bring high potential gains, Russian firms face additional costs and risks. The potential problem is the increase in direct and indirect costs (Stout, 2017) and transaction costs (Hennart, 2010; Williamson, 1993). A company that is subject to economic sanctions may lose negotiating leverage due to the lack of available options for alternative partnerships, which, in turn, leads to less favorable conditions of agreements. Geographic distance can increase logistics costs, while difficulties in doing business in a new country can lead to additional spending on marketing and related activities. Additionally, new suppliers may provide products and services of lower quality or request a higher price for the same supply. Failure to find a proper substitution can increase the costs of production, reduce the consumption of the company’s goods or services, and even contribute to displacing the company from the market (Ahn & Ludema, 2020). At the same time, the previous experience of firms in the sanctioned country significantly mitigates the impact of sanctions (Crozet et al., 2021).

Sanctioned companies may experience a loss of opportunity cost. This effect works not only for the sanctioned country, but also for those that imposed the sanctions. For example, between 1975 and 1989, when the US imposed sanctions against the USSR, American companies could earn approximately USD 5.5 billion (USD 15.4 billion in 2019 dollars) by maintaining trade relations with the USSR (Stout, 2017). Due to the US embargo on Russian oil equipment (1975–1989), losses of the US companies were estimated in the range of USD 1.54–2.0 billion (USD 4.6–6.0 billion in 2021 dollars). Economic sanctions can also force the company to withdraw from certain joint ventures. For example, ExxonMobil, the world’s largest energy company originated in the US, slowed down and then terminated working on many projects with a Russian counterpart. The economic sanctions against Russia also put GAZ at risk in a way that affects contracts with German carmakers Volkswagen and Daimler, as well as the US based firm Cummins, Inc.

Economic sanctions can also lead to changes in the cost of capital, production capacity, equity prices and employment (Stout, 2017). The effect of economic sanctions on organizations leads to a loss of production opportunities, which, in turn, can result in unused capacity, increased cost due to reduced economies of scale, increased cost of capital due to sales losses and lowered rates of return, as well as higher borrowing costs. The economic sanctions against Russia also affect companies established in other countries (Abramova & Garanina, 2018). ExxonMobil experienced a significant decrease in stock valuation of the company. The effect on other indicators was not that obvious, but was expected due to the limited time frame available at the time of the investigation (Stout, 2017). Another example is the overall impact of economic sanctions on American companies in connection with the introduction of sanctions against the USSR following

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13 Ibid.

14 Ibid.
the invasion of Afghanistan (1980–1981). The harm to the US business was estimated at USD 80 million in annual revenue from technology and USD 200 million from other chemical related items.

Another consequence of the introduction of sanctions for business is damage to the brand image. For example, 12 McDonalds restaurants in Russia were accused of violating sanitary standards and temporary closed in 2014. It was viewed by some experts as retaliation for the economic sanctions and tarnished the image of the company (Stout, 2017). Foregone profit due to the lack of presence in the business leads to the loss of the company’s visibility in the country and competitive advantages. Owing to the unfavorable economic environment in Russia, the soft drinks producers’ brands Pepsi-Cola and Coca-Cola closed or partially suspended their operations in the Russian market. For the US firms, this can lead to the loss of not only the revenue stream, but also the market share that can be seized by a competitors’ business.

One of the major negative effects of sanctions is the loss of access to foreign inputs (Abramova & Garanina, 2018). Companies are forced to look for new suppliers of goods and services in other markets to compensate for losses. It is expected that companies operating in global markets experience less difficulties in getting an access to new foreign resources than those operating only domestically as they have wide external network and experience in forming new partnerships (Wang & Lam, 2019). They also possess practical knowledge and experience of operating in different markets and have an advantage in organizing the logistics process in different countries. On the contrary, companies that do not operate in various international markets are less competitive and more vulnerable to changes in the supply of goods (Panibratov, 2016). Competitiveness and ability to adjust to a changing environment can help the sanctioned companies to conclude new supply contracts with foreign partners. However, the companies have equal chances to find new suppliers in the local market. Thus, it is expected that companies operating internationally are more flexible when shifting to other foreign markets than those operating only domestically. However, they have no advantages in entering into new agreements in local markets.

The economic sanctions against Russia also influence the relations of Russian companies with their foreign partners in the supply sector. Companies face bans in trade relations with different countries and are not able to procure technologically advanced products. Companies operating internationally are more flexible to enter onto new agreements in foreign markets, but they are not at the forefront in terms of entering into new agreements with local partners. However, it is important to emphasize that, on average, companies admit that it is challenging to find a proper substitute in the Russian market (Vorotnikov et al., 2019). Despite the fact that import replacement opened up new opportunities for finding a substitution in the local market, this policy had its limits, since some equipment had never been produced in Russia before, and it requires some time to launch manufacturing. Thus, due to the difficulties in finding suppliers in the local market, companies are forced to look for new markets abroad (Panibratov & Michailova, 2019).

Based on the above considerations, we can assume that differences in the conditions of doing business for Russian firms operating in Russia are minor, and therefore we suggest:
Proposition 1a: Russian sanctioned companies operating domestically experience the same difficulty in replacing suppliers at home as Russian sanctioned companies operating internationally.

Emphasizing the importance of international experience and the ability to adjust to changes in uncertain market conditions, the second proposition is:

Proposition 1b: Russian sanctioned companies operating domestically experience more difficulties in replacing suppliers in foreign markets than Russian sanctioned companies operating internationally.

Sanctioned firms experience difficulties while operating in countries that have imposed sanctions which changed relationships with customers. To utilize unused capacities and maintain production, companies may decide to enter new domestic markets. Although it is important for companies to focus on enhancing sales on domestic markets, they can also benefit from expanding operations in foreign markets (Milutina, 2018). Companies that already operate abroad possess knowledge and reputation, have developed value chains and can adapt to external changes faster than firms operating only domestically (Hennart, 2010). This provides them with an advantage in performing in foreign markets and increases their chances of successfully entering new markets, mitigating risks and protecting the company from sanctions. International experience gives companies an advantage in the speed of adapting logistics processes and increasing brand awareness in other markets. Even if a company is forced to leave certain markets and stop supplying its products or services to certain countries, it still has a structured supply chain and knowledge to do business internationally. Given these advantages and higher competitiveness, international companies are more likely to apply their unused capabilities in other foreign markets than domestic companies.

The economic sanctions imposed against Russian firms lead to a ban on operations with many important markets. Although international and domestic Russian companies have equal chances to expand domestically, the decrease in purchasing power and shrinking demand in Russia create difficulties in compensating for losses locally (Ahn & Ludema, 2020). Instead, companies may seek to enter new foreign markets, such as BRICS, the EAEU, as well as the countries of Central and Southeast Asia (Babkin & Baikov, 2017). Companies with experience of working in other markets have an advantage when entering new markets because of their experience and obtained knowledge.

Following this logic, here are the next two propositions:

Proposition 2a: Russian sanctioned companies operating domestically experience the same difficulty in finding a replacement for consumer markets in Russia as Russian sanctioned companies operating internationally.

Proposition 2b: Russian sanctioned companies operating only domestically experience more difficulties in finding a replacement for consumer markets in foreign markets than Russian sanctioned companies operating internationally.

One of the main direct effects of economic sanctions on companies is the restriction of access to foreign capital. The impact of sanctions on foreign investment may change over time, depending on the cost of sanctions and the initiator of sanctions (Mirkina, 2018). Interestingly, although sanctions have a negative effect on some firms’ indicators in the long
run, cross-border financial flows suffer a strong and immediate negative effect. However, in any case, this limits the ability of companies to receive financing. Turning to other markets in search of new sources of financing, firms may face higher costs, unfavorable transaction terms and increased dependence on fewer investors. Better credibility in the global market, experience in attracting financing and higher transparency of their financial activities allow international companies to have more favorable conditions for entering foreign financial markets via reducing the indirect costs of creating new partnerships. However, international and domestic companies of the same nationality can equally benefit from financing in local markets.

For many Russian firms, access to external financing from the US, the EU, and their allies has been limited since the third quarter of 2014, while the gross foreign debt, especially the banks' foreign debt, decreased by about USD 210 billion in the period 2013–2017 (Korhonen et al., 2018). The cross-border bank lending declined by just over 50%, and the average FDI flow dropped from USD 54.5 billion per year in 2013 to USD 7 billion per year in 2015. In 2016, the FDI flow began to increase, but the FDI net inflow was still much lower than the pre-sanctions level. FDI strategy makes firms more competitive in the market and helps maintaining higher effectiveness (Fedorova et al., 2018). Thus, an increase in inward FDI from new markets can diversify risks and help companies to withstand negative consequences of sanctions. Accordingly, Russian firms operating abroad may have better chances to attract foreign capital as they have experience of operating abroad, a stronger brand and image, and transparency in their operations.

Financial sanctions against Russian state-owned and state-controlled banks adjust their international and domestic risks (Mamonov et al., 2021). First, banks that are anticipating debt sanctions are raising international borrowings (especially in Moscow). Accordingly, they are decreasing their foreign assets (especially if they are located farther from Moscow). Second, banks that could have expected asset sanctions cut own international borrowing and sold foreign assets in advance (Mamonov et al., 2021). Sanctions stimulate the return of capital to Russia as leverage to reduce investments of foreign firms. The government introduces new initiatives aimed at encouraging local businesses to repatriate their capital and creating a favorable investment climate, e.g. tax breaks for Russian citizens who become local tax residents. Companies operating locally are expected to have the same leverage and conditions of receiving financing in home markets as companies operating internationally. Based on the above observations, the next two propositions are as follows:

**Proposition 3a: Russian sanctioned companies operating domestically experience the same difficulties in finding a replacement for financing in Russia as Russian sanctioned companies operating internationally.**


Proposition 3b: Russian sanctioned companies operating domestically experience more difficulties in finding a replacement for financing in foreign markets than Russian sanctioned companies operating internationally.

The government not only plays a key role for firms in emerging economies in general, but may also be of critical importance in mitigating the negative effects of economic sanctions on national firms (Panibratov & Michailova, 2019). It can either assist them directly through subsidies, loans, and governmental contracts, or create conditions in the market that would provide firms with new opportunities. Companies that have lost their access to Western markets and have not found a replacement are seeking for government money, partnerships with the state, and other types of assistance that the government can provide them.17

The government can help companies to offset losses by offering them governmental contracts. On the one hand, it helps businesses that experience difficulties to realize their potential. On the other hand, it can ruin the competitive climate in the country. For example, in order to “shield” (Ahn & Ludema, 2020) the sanctioned Bank Rossiya, the Russian government granted the bank an exclusive contract for servicing the domestic wholesale electricity market amounting USD 36 billion.

The lack of access to financial resources in the foreign market can cause auxiliary flows from the government in the form of subsidies and loans (Mirkina, 2018). Although this practice is very popular due to its simplicity and high speed of implementation, it shifts the negative impact of sanctions on the government and leads to the depletion of state financial resources. For example, from 2015 to 2017, the Industrial Development Fund allocated loans totaling about RUB 250 billion (around USD 4 billion) in various projects, primarily in the automotive industry, agricultural, special and mining machinery (Vorotnikov et al., 2019). To offset the losses from the sanctions, VTB Bank received USD 5.4 billion in state financial assistance.18

The government can not only directly help companies but also create an “ecosystem” in which firms can find their own way to mitigate or overcome sanctions. Simplifying the process of creating partnerships with other countries, signing framework agreements that facilitate the process of doing business in other countries, or lowering taxes on certain factors can foster companies to find new partnerships in other countries. It was also found that governments of developing countries play a significant role in creating incentives for companies to innovate, since markets are not effective distributors of resources (Chandran et al., 2013). During the economic sanctions, when innovations give companies an opportunity to overcome their negative consequences, the government is expected to focus on creating conditions for product and process innovation. A favorable legal and institutional context in the country can also enhance the willingness of companies to introduce innovations (Trott, 2012).

In July 2018, the Russian government worked out a comprehensive plan to provide “systemic support to victims of sanctions” (Gould-Davies, 2018). It included, in particular,

17 https://www.bnnbloomberg.ca/large-russian-companies-are-turning-inward-1.1112107
18 https://dlib.eastview.com/browse/doc/42659672
initiatives to reduce the use of the dollar in foreign trade payments, to support the access of sanctioned companies to the domestic financial market, and to reduce dependence on foreign patent holders. In turn, the countries that introduced the economic sanctions began to look for ways to limit the access of Russian firms to replacing partnerships. For example, the Ukraine Freedom Support Act of 2014 allowed the US to impose secondary sanctions against entities that violate the US sanctions on Russia. The Russian government established the Industry Development Fund that allocates money from the federal budget as soft loans to Russian companies that have expressed interest in designing, developing, or manufacturing any kind of equipment or technology that were primarily imported before the sanctions. Since 2017, companies can also sign a Special Investment Contract (SPIC) with the Ministry of Economic Development of Russia that started allocating investments for localization of production in Russia.

The majority of sanctioned Russian companies (both international and domestic) are those that play a significant role in the national economy. The underperforming of these companies can lead to negative consequences for the Russian economy and for the socio-economic environment of the country. The government is expected to take equally strong measures to assist both groups of companies — domestic and international. Thus, the next proposition is:

*Proposition 4: Russian sanctioned companies operating only domestically receive the same level of government support as Russian sanctioned companies operating internationally.*

### 4. Prospects for innovations

One of the important aspects of economic sanctions is a change in the attitude to innovation at the country and firm level. Innovations have direct and indirect effects on firms’ performance and can become a strategic factor that ensures the growth and wealth of the company (Bolivar-Ramos et al., 2012). Companies that use the latest achievements and technologies have more chances to survive in conditions of uncertainty and sustain competition (Kim & Pae, 2007). During economic sanctions, innovations can become a source of overcoming the corresponding negative consequences. Product and process innovations lead to higher sales and growth rate (Goedhuys & Veugelers, 2012). Referring to the endogenous growth theory, it can also be argued that the economic growth of a company is highly dependent on internal forces, mainly innovations (Solow, 1956). Economic sanctions most often entail blocking technologies that pushes companies to look for other means to compensate for lost opportunities and find new ways to maintain economic growth (Afesorgbor, 2019). It is interesting that the more complex and dynamic the regulatory business environment, the more likely an organization will pay special attention to training and innovation in its products and processes development (Milutina, 2018).

There are differences in the attitude and capability to innovate between domestic and international firms. First, companies that operate abroad are more productive and innovative, because they have better access to international contacts, accumulated
knowledge and advanced technologies (Sharma, 2018). Secondly, even in the case of limited access to external resources, which may occur during economic sanctions, firms operating abroad have more initiatives to innovate, since they compete in global markets and must be more efficient to survive (Chandran et al., 2013). International openness is very important for stimulating innovativeness and productivity, which are achieved through competition and access to different markets (Goedhuys & Veugelers, 2012). In contrast, domestic companies are less exposed to international markets and thus, are less likely to use knowledge from other countries.

According to a survey of 603 Russian domestic enterprises conducted by the Skolkovo Innovation Center (known as the Russian Silicon Valley), about half of the firms (50%) declared their interest in going abroad, especially to Asian markets (Skolkovo & TusPark, 2016). One of the main challenges these firms are facing is the lack of knowledge about doing business abroad and the lack of special capacities, such as innovations and others (Neparko & Frolova, 2019). These problems are addressed to a greater extent to domestic firms and are less critical for internationally operated ones, since they have better access to knowledge due to global experience and networks (Davidson et al., 2018). There is a low level of participation in innovation activities of domestic Russian firms (about 20–30%); whereas, large international companies demonstrate a relatively high level (about 75%).19 Thus, sanctioned Russian domestic firms show less initiative in introducing innovative capacities than international ones: the larger the company, the more it is inclined to innovate (Davidson et al., 2018).

The economic sanctions limited the access of Russian firms to foreign technologies. To encourage companies to innovate, the Russian government started offering various lowered tax duties on the import of certain components for the production of innovative equipment and products (Vorotnikov et al., 2019). Russia pursues an active innovation policy; one of its goals is to expand participation of businesses in research, technologies and innovations (Davidson et al., 2018). It facilitates innovation in companies through loans, subsidies, and tax breaks. Import substitution initiatives are intensely introduced in different industries, thus boosting the development of technologies at the organizational level. In order to be more competitive in the home and foreign markets, companies need to focus on being more technologically advanced (Milutina, 2018). While international companies demonstrate great initiative in the field of innovation due to their international exposure and experience, domestic Russian firms do not possess the same technological achievements, resources, and a global network to maintain innovation in the company (Vorotnikov et al., 2019). Taking all the above into account, the next two propositions are as follows:

**Proposition 5a:** Russian sanctioned companies operating domestically show less initiative in introducing innovations into business processes than Russian sanctioned companies operating internationally.

**Proposition 5b:** Russian sanctioned companies operating domestically show less initiative in introducing product innovations than Russian sanctioned companies operating internationally.

The resilience of the company in the conditions of fierce competition and market uncertainty can be explained by better manageability of human resources in organizations (Melnikov & Yaremchuk, 2018). Sanctioned firms are expected to emphasize the creativity of the employees to generate ideas for new markets, develop new partnerships, improve products and processes. The task of the top management is to improve the firm’s efficiency by creating an innovative environment, encouraging product development and business processes, and promoting new ideas among employees (Ridge et al., 2017). This allows the company to maintain the level of performance despite external factors, such as economic sanctions. For example, high-tech projects, such as the Crimean Bridge project and Nord Stream-2, require special innovative solutions. Despite the fact that the US has imposed sanctions on Russian companies, the pipeline will be completed with the collaboration of West-European partners.20 Thus, the experience of working in the least favored conditions is extremely useful for domestic companies.

In order to sustain or develop competitive advantages in the marketplace, companies should facilitate implementation of new technologies (Kim & Pae, 2007). Advances in technology can increase the viability of a company by lowering production costs, entering new markets and developing innovative strategies, solutions or products. Given the link between talent management practices and performance of a company (Latukha, 2015), it is expected that companies affected by economic sanctions should emphasize the innovativeness of their culture and encourage employees to develop new ideas to enhance their competitiveness in rigorous conditions.

To maintain the level of competitiveness and innovativeness of the firm, employees and managers of the organization need to develop skills and competencies that help them acquire, develop and apply resources. This process can take a considerable time, but signals that the company is changing the focus in human practices can be observed in a short time and perceived by the employees as an encouragement of innovations. Since there is a positive relationship between the innovativeness of the company and its performance, the development of talent management practices can become a cornerstone in adapting to economic sanctions. Due to the undeveloped talent management practices in Russia, there is a long road in front of Russian companies in terms of attracting and retaining employees (Latukha, 2015). It can be expected that a firm that faces external difficulties in the market will be forced to develop these practices faster than domestic ones. The diversity and tenure of managers can improve the innovativeness at the company (Guo et al., 2018), and the experience and abilities can help the firm to cope more successfully with international expansion and improve its performance in foreign markets (Hutzschenreuter & Horstkotte, 2013; Latukha & Panibratov, 2015).

Russian companies are aware of the positive impact of talent management practices and the importance of encouraging and stimulating employees, but they lack interest in applying these techniques (Latukha, 2015). Additionally, the speed of applying new practices in Russian companies is lower than that of their foreign competitors. In turn, foreign companies demonstrate a more mature approach and a serious attitude to talent

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management. Due to a wider access to the foreign market, the experience in dealing with international companies and the need to compete in the global market, Russian companies operating abroad are expected to have more intentions to implement advanced talent management practices and promote innovativeness of employees. A tough competitive environment, labor mobility of management and international exposure can lead to the fact that international companies will pay more attention to creating an environment in which employees feel opportunities for innovation and exchange of new ideas, compared to companies operating only in Russia. Thus, the next proposition is:

**Proposition 6: Russian sanctioned companies operating domestically pay less attention to the innovativeness of employees than Russian sanctioned companies operating internationally.**

### 5. Discussion

This study emphasizes the differences between Russian international and domestic firms in their ways of adapting to the economic sanctions. Companies operating in foreign markets possess the advantages of international experience, global network and competitiveness, which can potentially lead to simplification of the process of finding new suppliers and financial resources abroad, entering new foreign markets, introducing product and process innovation, and creating an environment facilitating innovations within the company. However, government support and the possibility to enter new agreements in their home country are equally available for both groups of companies.

Using the example of Russia, the paper answers the question whether there is in reality an advantage of internationalization for Russian firms during the sanctions. It is assumed that national firms operating in foreign markets can find new foreign partners and introduce innovations easier than those operating domestically. Despite the initiatives introduced by the Russian government in the field of import substitution and shielding the sanctioned companies, the Russian market is not sufficiently developed to provide companies with all the necessary resources locally. That is why internationalization can bring significant benefits to companies in overcoming the negative effects of economic sanctions.

Two important and specific implications of this paper are the impact of sanctions on cooperation and innovation, and both are subject for future studies. While remaining critical of the proposed insights without their empirical confirmation, we assume that there may be a contradiction between the propositions we made and the anecdotal evidence of Russian firms.

Thus, although the propositions state that Russian firms with international operations may have easier access to foreign suppliers and financial resources, we still need to find evidence to prove this, otherwise internationalization cannot be considered as a “helping hand” for sanctioned firms in finding new suppliers and capitals in either of the two markets.

Despite the literature-based argumentation of the advantages of Russian international firms over domestic ones in their access to foreign suppliers and financial resources, both groups of companies may face difficulties in finding financing and procurement
in foreign markets, as sanctions severely restrict lending to Russia by EU and US banks (Russell, 2018). Despite the variety of markets where Russian firms might expand, the restrictions imposed by a foreign government apply equally to all firms originating from Russia. The economic sanctions against Russia created an environment in which all companies are experiencing difficulties in finding partners in local markets and abroad (Vorotnikov et al., 2019).

Operating in the international market may not necessarily provide an advantage in terms of new partners in the local market but will rather facilitate the search for new foreign markets. The proposal that the government should provide the same level of assistance to both types of companies equally regardless of their international activities would also require further justification, since, having different control and interest in national firms, the Russian government can help sanctioned firms differently, regardless of the scale of their internationalization.

Although it was suggested that there were differences between international and domestic firms in their intent to invest into innovations during the sanctions, the significance of these differences may vary. The specifics of Russian companies can be explained by the fact that all of them share a cautious attitude to the changes introduced in their process: only 8.4% of Russian companies were engaged in organizational innovations in 2016 (Russell, 2018). Additionally, innovations in business processes require time and resources that are limited during sanctions, and companies may prioritize other initiatives.

As expected, internationally active firms are more focused on product innovation. Given the fact that companies resort to manufacturing new products to the same extent as they resort to product modification, it can be argued that they see prospects and opportunities in introducing new products or improving old ones to overcome the consequences of sanctions (Singh & Subrahmanya, 2018). Coupling with easier access to new markets in Russia and abroad, internationalized firms can mitigate the negative effects of sanctions faster than domestic ones. The higher degree of product innovation of international companies compared to domestic companies can be explained by a wider network of international contacts and familiarity with foreign talents, resources, and ideas, which leads to lower operation costs. In addition, the import substitutions policy pursued by the Russian government can become a driver for the product innovations (Vartanova & Osadchaya, 2018).

Finally, although it was stated that Russian sanctioned firms operating internationally explore the employees’ innovativeness more than domestic companies, international companies may attach more value to the creativity of employees and emphasize it during the period of sanctions. This may also be connected to their diverse experience and familiarity with international practices that are less popular among Russian organizations.

**Conclusion**

Although the paper contributes to the study of the consequences of sanctions, some limitations should be mentioned. Firstly, the specifics of the Russian case complicate the
generalization of the results. The analysis provides an opportunity to consider the impact of sanctions on other developing countries, but the results should be confirmed using other cases. The attitude of Russian companies to business process and product innovation, as well as state support for local firms and Russian counter-sanctions can distort the overall applicability of the results, while it is an undisputed fact that heterogeneity does exist among firms at the regional and country levels. Secondly, it is important to mention that, even though economic sanctions target specific companies, their negative consequences apply to a much larger number of firms than only to the direct targets of the sanctions, as well as to foreign companies operating in the sanctioned country. To a certain extent, all companies need to adapt to the changing environment and use new approaches to operate in the domestic and foreign markets. Although this research focuses only on companies that are direct subjects of economic sanctions, the scope of analysis can be extended to all organizations that are affected by them.

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**References**


Promotion of a healthy lifestyle in Russia and China: The first results of COVID-19 and trends in the post-COVID economy

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Abstract
The COVID-19 pandemic has not only become a test for all mankind, but also gave reason to rethink the attitude to their health not only for people from the high-risk category, but also for everyone. Before the pandemic, the concept of a healthy lifestyle was gaining a powerful economic momentum (popularization of communities associated with fitness products, advertising, healthy products, etc.). But has the trend changed after the restrictions were eased? The purpose of this paper is to find out whether the healthy lifestyle concept affected the preservation of the health of the nation during the pandemic (is there a link between the level of national health and the degree of resistance to pandemics?). The study focuses on two countries — Russia and China. The difference in the population’s perception of the healthy lifestyle concept, promotion of a healthy lifestyle at the governmental level, and the assessment of its effectiveness are determined based on the analysis of secondary statistical data, a survey of 1,230 respondents from Russia and China in late 2020 — early 2021, as well as using econometric factor analysis. The results obtained can be scaled to the rest of the BRICS countries in order to adapt existing state programs to preserving the health of nations in the future.

Keywords: healthy lifestyle, HLS concept, national well-being, BRICS, COVID-19.

JEL: I12, H51, J11, M3.

Introduction
Today, it is a generally recognized fact that the health and well-being of the population are key factors of economic and social development all over the world. The prospects

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for the development and existence of the state itself largely depend on how the process of reproducing the basis of productive forces — human resources — takes place. Young people are the key, reserve and engine of the countries’ development, their present and future. The current state of youth health and the general demographic situation in society indicate that there is a real need for the development of a healthy lifestyle culture of various groups of the population of any country, primarily, the younger generation. The health of the young population is the highest value of the social and socio-economic development.

The major goal of a state’s public health policy is to improve the health of all people and reduce health inequalities by improving governance and strategic leadership in the interests of health.

Popularization of a healthy lifestyle through mass media, which is the basis for the popularity of physical exercises, proper nutrition, good sleep and reduced interest in bad habits, increases the effectiveness of many aspects of public health. Due to their visual and auditory attractiveness and accessibility of television, radio, modern computer technologies, the Internet, and social networks, they significantly affect the minds of ordinary citizens. Success and popularity of something in any kind of activity is 60% dependent on promotion and successful advertising campaigns reflected in the mass media. Thus, it is the information presented by the media that is the main criterion for evaluating a healthy lifestyle and forming the right image of a healthy lifestyle. After all, ignorance, misunderstanding and prejudice form an image just as much as real actions.

In 2019, the world was faced with an unknown virus that caused the great global COVID-19 pandemic. Lots of sick people, lots of deaths, many were saved thanks to tough emergency measures on the part of the government (self-isolation regime, penalties for non-compliance with norms and rules of behavior during the pandemic, and so on). After several stages of vaccinations and three waves of the pandemic had passed, a research question arose: How did a healthy lifestyle help people during the pandemic, and did it help at all? The search for answers to this question formed the basis of this study and determined its relevance.

1. **What does the HLS concept mean?**

Consideration of the problem of people’s attitude to the concept of a healthy lifestyle (HLS) is quite important in the conditions of the modern socio-cultural situation in the world as a whole, as well as in Russia and China in particular. Of course, the processes of globalization, informatization and commercialization have influenced values and practices of an ordinary citizen. The greatest influence is experienced by young people who intensively “absorb” new trends and values (Katic et al., 2019; van den Berg et al., 2008; Ronald & Chuk, 2008).

The living conditions of a modern person put forward urgent tasks of improving the scientific analysis of his health problems. A human being is the supreme value of society, and his health determines his harmonious development. Therefore, the health
of an individual is the key to the comprehensive development of society (Jones, 1995; Ghebrehiwet, 2009; Lunau et al., 2018; Nazdrachev & Mashichev, 2020). According to M. Otnyukova, human health is a social value, an integral part of social wealth, and it depends on society how health is used, protected and reproduced. The analysis of human health becomes a necessary condition for the disclosure and improvement of human abilities and capabilities as a driving force and the highest goal of social progress (Otnyukova, 2007).

The current trend in the study of health is interdisciplinary research, which increases its theoretical and practical effectiveness. The integral science of valeology has played a substantial role in the study of how to solve health problems of a person. Valeology is the science of a healthy lifestyle, it teaches complex measures that must be applied to preserve one’s own health, strengthen it and prevent diseases (Kaznacheev, 1997, 36). Despite the development of valeological research, almost all works devoted to health pay more attention to the indicators of “pathology” than to indicators of “health.” By inertia, the analysis of the predominantly negative side of the dialectical unity “disease—health” continues. At the same time, not enough attention is paid to direct health indicators, which leads to a one-sided interpretation of the problem of human health and the factors that determine it.

An important place is given to fundamental research on certain aspects of health diagnostics and monitoring: interdisciplinary research of health mechanisms and affecting factors (Kooiker & Christiansen, 1995; van Doorslaer et al., 1997; Kogan, 206); creation of databases of valeological information (Nikiforova, 2011; Tolmacheva, 2015; European Database..., 2018); mathematical models (Kalachikova & Korchagina, 2015; Petrush & Murtazina, 2018; Jenatabadi et al., 2021; Wedlund & Kvedar, 2021); expert systems of evaluating health indicators (Allegra et al., 2020; Jespersen et al., 2021); and intellectual health support (Meyer, 2010; Chestnov et al., 2015; Kakani, 2020; Bent et al., 2021).

The definition of practical ways of preserving health requires the definition of the essence of the key concept of “health.” Our research confirms the existence of more than 450 definitions of human health, which are offered by specialists and scientists from different scientific fields and countries. There are six main types of essential elements of the definition of health (Appendix 1, Figure 1).

It should be noted that there is no generally accepted definition of “human health.” Many researchers traditionally continue to believe that the solution of this problem is exclusively a problem of the biomedical sciences. But we note that human health is also a problem of philosophy, sociology, psychology, pedagogy, economics and a number of other sciences. The lack of a constructive and unified approach to the definition of health creates difficulties and uncertainty in the results of scientific research to assess the impact of various factors on health, determine the level of health, and competently search for optimal ways to preserve health.

Within the framework of this study, the term “health” will be understood as the result of a purposeful influence on the human body in order to preserve its functional mechanisms for a long time (nutrition, physical activity, sleep, psychological relief, balance of work and rest).
2. The history of a healthy lifestyle in Russia and China

A healthy lifestyle (HLS) is a type of activity aimed at preserving and strengthening health. The psychological culture of a healthy lifestyle is an integral part of the general and professional culture, which is a systemic characteristic of a person. HLS is a socially, ontologically and internally determined level of assimilation, awareness, use and functioning of special psychological values, which include effective medical and psychological knowledge, skills, and abilities aimed at following a healthy lifestyle, preserving and strengthening health (Nadtochaev, 1990; Aleksander & Selesnik, 1995; Garbuzov, 1995; Noskova, 2013).

The beginning of the XX century became a turning point in the history of the formation of the concept of a healthy lifestyle in Russia and China, which distinguish the current understanding of a healthy lifestyle in these countries. Thus, we can formulate the first hypothesis of the study:

$H1$: The traditional concept of a healthy lifestyle (China) is more effective than the adaptive one (Russia), which leads to a higher level of health of the nation in the modern period of the economy.

In the Soviet Union, a healthy lifestyle was actively developed and supported by the state. In the USSR, the promotion of physical education was a task of national importance. There was an opinion that healthy people were able to resist the enemies from the West and demonstrate the greatness and power of the Soviet Union (Nikiforov & Dudchenko, 2017; Petrash & Murtazina, 2018).

The popularization of sports was carried out at all levels, the media constantly broadcast about the achievements of Soviet athletes, posters and other merchandise were produced. Every morning, television and radio encouraged the population to be physically active. The life of a Soviet person was considered inferior if it did not include physical activity and good health. Children went to sports sections from an early age. The morning at school began with exercises, warm-ups were also held in the classroom and after lessons. Each student was obliged to engage in physical culture, and non-compliance with sports norms or skipping classes were severely punished. In fact, the people who did not play sport were deprived of benefits and respect in society (Field, 1995).

For most adults, sports were the only right way to develop. For almost all the time of the existence of the Soviet Union, one of the most important tasks was to instill a love for sports. There were many reasons for this, but the main one was health care. Those who came to power in 1917 got a huge country with a very weak, almost absent medicine. It must be noted that in the Soviet Union, the advocacy of a HLS was more than successful. Health was a real sign of dignity and valor. At that time there was a real cult of health. With the help of promoting a healthy lifestyle and sports, the main cultural, social, economic and political tasks of the USSR were solved. Such a massive work brought enormous results — the USSR remained the strongest sports power in the world for many years.

In modern Russia, things are a little worse. Political, economic, and social problems of the 1990s had a negative impact on the physical education of the population. The promotion of sports was practically absent, as compared to the USSR. After the
“opening of borders,” a huge number of foreign goods arrived in Russia, including harmful food, alcohol, tobacco products and narcotic substances. This has led to an increase in mortality, diseases and crime. Many schoolchildren had a tobacco addiction, which led to their skipping classes and refusing to attend sports sections.

Over time, the situation began to change. After the establishment of a relative political stability, the government of Vladimir Putin began to pay more attention to the lifestyle of the population. Since January 2002, the vector of sports education has changed dramatically. The main tasks were the creation of a new sports industry, the birth of a healthy generation, and instilling a love for a healthy lifestyle among young people.

Thus, over the past 20 years in the history of modern economic Russia, one can observe the complete collapse of the state-established system of healthy lifestyle of citizens (Walberg et al., 1998; Roberts et al., 2012) and the emergence of a new adaptive HLS concept (Rtveladze et al., 2012; Strategy 2025., 2020), taking into account the digitalization of society, informatization of all spheres of society, as well as relevant methodological and medical discoveries that give qualitatively new results for the nation today.

The modern concept of the Chinese national philosophy of life organization (healthy lifestyle) differs from the generally accepted concept: “Proper nutrition, sports, absence of bad habits.” The focus is still on the “spiritual” nature of a person and his psychophysical health. Let’s consider the “Chinese concept of a healthy lifestyle” in more detail.

A promising direction of studying the Chinese HLS concept, which have become a subject of general scientific consideration, is the psychosystem approach. It is presented by an international group of scientists who have substantiated the universal laws of the formation of the structure and dynamics of the development of any functional system, including a person, as a universal biological and social system of life (Jan, 1990; Zheng, 2018).

The main idea of psychosystemology is that nature (the surrounding world) and the inner world of a person develop according to uniform laws based on the principles of universality, expediency, consistency, and causality. This makes it possible to effectively diagnose, predict and model various psychological systems (Appendix 2).

An important principle of the psychosystem approach is the provision that if at least one element in the system changes, the system as a whole also inevitably changes: a healthy person (the level of medicine), a healthy nation (the social aspect), and a healthy humanity (the philosophical aspect). In accordance with the types of activities and manifestations of a person in his relations with the external environment, psychosystemology suggests forming a system of a healthy lifestyle as a system of seven levels of human relationships with the surrounding world (Appendix 2).

In the process of development of sports in various spheres of Chinese society, there inevitably occurs a differentiation of social policy, that is, the allocation of differently designed directions, sections and variations. This is due to the fact that sports, medicine
and healthy lifestyle are generally diverse, and specific goals implemented in different circumstances of practice, as well as the ways and conditions of achieving them are not always the same (Ma et al., 2013; Khow et al., 2021; Halawa, 2021; Zhao et al., 2017; Sun et al., 2021).

It is important to emphasize that in modern conditions, the number of harmful factors is increasing. These are such factors as tobacco use, insufficient physical activity, poor nutrition, excessive alcohol consumption and others, which do not contribute to a healthy lifestyle. On the one hand, China honors and continues the ancient traditions of the healthy lifestyle concept — the very essence of the concept has remained unchanged, but many dangerous factors that require contemporary methods of solving have also appeared in the modern Chinese economy. The main problems of the HLS in China today are obesity, infectious diseases, and a decrease in physical activity due to the digitalization of society.

3. Specifics of promoting HLS in Russia and China

Promotion of the HLS is of great importance for the development of humanity and individual nations as it is a model of human activity recognized in a certain society and aimed at preserving and improving one’s own health. The HLS promotion is not a new concept. The fact that health is determined by factors not only within the health sector, but also outside it, was recognized long ago.

Health education and HLS promotion are two terms that are sometimes used interchangeably. Health education is concerned with providing health information and knowledge to individuals and organizations, as well as providing skills that allow people to voluntarily adopt healthy behaviors. This is a combination of accumulated experience designed to help individuals and communities improve their health by expanding knowledge or influencing attitudes, while the HLS promotion requires an integrated approach to health through involving different participants and focusing on different approaches (Borowiec et al., 2016). The promotion of HLS is broader and is aimed at responding to events that are directly or indirectly related to health, such as inequality, changing consumption patterns, the environment, cultural traditions, etc. (WHO. South East... 2008).

A report, known as the Lalonde Report, published by the Government of Canada in 1974, challenged the traditional “biomedical concept” of health, opening the way for an international discussion about the role of non-medical determinants of health, including individual risky behavior. The concept of health care sets out 4 “basic pillars” of a healthy nation: lifestyle, environment, health organization, and human physiology. The Lalonde report was criticized by skeptics as a ploy aimed at stopping the growth of health spending in governments by adopting health promotion policies and shifting responsibility for health to local authorities and individuals (Terris, 1992, 267; WHO Geneva..., 1998; Glouberman & Millar, 2003, 389; MacDougall, 2007, 957).

Growing public health expectations around the world prompted WHO, in partnership with Canada, to hold an international conference on promoting a healthy lifestyle in 1986.
It took place in Ottawa and not only prepared the “Ottawa Charter for Health Promotion,” but also served as a prelude to subsequent international conferences on health promotion. The Charter defines the HLS promotion as one of the following measures (Milestones in Health Promotion, 2009):

a) formatting sound public policies that combine diverse but complementary approaches, including legislation, tax measures, taxation and organizational changes, in order to develop policies that promote equality;

b) creating of favorable conditions;

c) supporting the activities of organizations by empowering organizations;

d) developing personal skills by providing information, health education and improving the skills to maintain health;

e) reorienting of medical services in HLS promotion, abandoning the simple provision of clinical and therapeutic services.

The main directions of the HLS promotion activities defined in the Ottawa Charter are of a comprehensive and complementary nature and form the basis of all relevant draft laws and state programs to preserve and support the health of nations around the world.

The main methods of HLS promotion in Russia can be divided into 4 groups: oral, printed, visual (pictorial) and combined promotion. The most popular method is oral promotion because it is simple, economical and accessible organizationally. Lectures, conversations, discussions, conferences, circle classes, quizzes — these events will be more effective for a certain circle of interested people, so this is not the most effective method for young people (Vartanova, 2019).

Print advertising is a diverse and accessible method that a person sees every day (an article, a memo, a leaflet, a newspaper, a magazine, a booklet, a brochure, a book, a slogan). For example, a sign with the inscription “No smoking” is a slogan, and in accordance with the adopted law on the prohibition of smoking in public places, it is very common. This type of printing products most often touches on the topics of bad habits: smoking, drug addiction, alcoholism. At the same time, the problem of combating these bad habits is very relevant for the modern young generation (Vartanova, 2019).

The visual method is quite diverse in terms of the number of tools included in it. First of all, these are art objects, such as posters, video clips, as well as all other kinds of reproduction of an idea through art. TV broadcasting can also be included in this group, and this is one of the most effective methods (Trykash et al., 2020).

A modern person spends a lot of time in front of a TV or computer screen, which shows a multitude of programs about healthy nutrition, physical training, sports, medicines, treatment of diseases, and much more. We can also see a huge amount of advertising, whether it is of a gym, fitness center or sports equipment, or social advertising. However, today more and more young people refuse to watch TV, but only because it is replaced by the Internet, where you can find everything you need, learn what you want, and all this in details and right now.

Thus, today the modern informatization of all mass media is fully represented on the Internet — gif images, mems, short videos, blogs, live streaming can also be attributed to new forms of promotion. On the personal pages of individuals who adhere to the
healthy lifestyle concept one can find all forms of promotion. Among other content, there are various ratings of sites about healthy lifestyle, lists of the best healthy lifestyle bloggers recommended for following, books and podcasts about healthy lifestyle, etc.

As of mid-2021, there are 149288 media outlets in Russia registered by the Roskomnadzor, of which only 26.34% belong to the public sector, and the rest belong to the private sector (Mass media in Russia, 2021).

As the modern Chinese scientist Wang Li notes, the HLS promotion is the best prevention of diseases, strengthening health and improving the quality of life of the population (75). By transforming professional medical information into popular information, the mass media thereby spread the values of a healthy lifestyle and have a positive impact on the public consciousness of Chinese citizens.

Researchers from different countries agree that today the media in China is an industry, and this industry is one of the key and profitable sectors of the modern economy, as well as one of the important levers of public promotion. Tracing the transformation of the newspaper business into an industry, Austin Jun Luo provides data showing that the most important trend in the development of the media market in China is concentration of media leading to formation of newspaper-magazine and multimedia enterprises based on system-forming newspapers. This often happens through the absorption of unprofitable non-party newspapers by influential periodicals of the Communist Party of China. Today, there are 41 concerns operating in the country, the largest of which is the Shenzhen Publishing Group (Luo, 2015).

In the field of electronic media, the Chinese Broadcasting, Cinematography and Television Group was established, which includes the largest and most expensive state assets: central TV (CCTV), the Corporation of the Chinese Radio and TV Network, the Central National Radio Station and International Radio, the Chinese Cinematography Group, etc. (China entertainment..., 2016).

Currently, there are three categories of media in China: traditional media, Internet media and mobile media. Newspapers, periodical journals, books, radio, television and movies are in the category of traditional media, whereas websites, video sites, search engines, social media, online games and electronic commerce are classified as Internet media. Each type of media associated with handsets could be defined as mobile media. In traditional media, the owner is most often the CPC or the government. Usually, telecommunication carriers or mobile service providers control and establish aspects of Internet media and mobile media, either independently or jointly with investment companies (Lai, 2021).

The success of the Chinese people is based on the carefully preserved history of one of the world’s greatest civilizations, the experience of reforms, and measures to preserve their own culture. It is also worth noting that any advertising and promotion in China always takes into account its consumer, and there is also strong public censorship

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2 https://rocit.ru/raccoon/98
in addition to state censorship. Almost 95% of all media outlets in China are controlled by the government.

The promotion of a healthy lifestyle in China belongs to one of the types of social advertising. Many topics of social campaigns in Russia and China coincide. Common topics include: the harm of smoking, a healthy lifestyle (including AIDS prevention), the importance of donation, environmental protection and consumption of eco-friendly materials and products, the danger of drugs, respect and care for the elderly, as well as health support at the age of 55+ and demography in the national context (in Russia it is the promotion of large families, and in China — the policy of 1 child — 1 family).

The popularity of public advertising is growing both in Russia and in China; its signs, themes and slogans are used in commercial advertising. But we must not forget that social advertising and promotion cannot solve the existing problem of preserving the health of the nation. This is just a way to attract attention and recommend an alternative or provide information, but the government should take it upon itself to solve these problems and regulate the level of health of the population of its country within the framework of state laws, projects and programs.

Thus, we can formulate the second hypothesis of the study:

**H2: HLS promotion is effective if it is initiated and controlled by the government.**

Certainly, the fashion of “being healthy” depends on the model of HLS promotion in a particular state. The generalized results of the study are presented in Appendix 3, Table 3.1.

According to Table 3.1, all the prerequisites have been met at the state level for the population to maintain a healthy lifestyle, receive help in combating bad habits, undergo a high-quality medical examination and receive a diagnosis at the early stages of various diseases. This fact is confirmed by the impressive health care expenditures of the analyzed countries (Appendix 4, Table 4.1).

The conclusions that can be drawn in accordance with Table 4.1 are as follows:

1) according to the available data of the world’s leading analytical companies, in comparison with 2018, healthcare costs (treatment, maintenance of medical institutions, payment of medical personnel and implementation of programs to support health and promote a healthy lifestyle) decreased in all countries included in this study;

2) until 2019, the trends in strengthening the health of nations and promoting a healthy lifestyle were preventive, not reactive; this is reflected in the last column of Table 4.1.

### 4. The COVID-19 pandemic: Cases of Russia and China

In the spring of 2020, the whole world was gripped by the global pandemic of the new coronavirus infection COVID-19. Life in all countries of the world was put on temporary pause, slowed down, stopped. Restrictions imposed in connection with the coronavirus pandemic had a significant impact on many aspects of life — on the
social, political, economic, and cultural spheres. Private business and the tourism sector suffered significant losses, many people lost their jobs, but its greatest impact the pandemic had on people’s health.

Taking into account the fact that health is more influenced by factors that are not related to the health sector, the promotion of a healthy lifestyle requires coordinated actions in the field of awareness-raising, financial investments, capacity-building, legislation, research and establishment of partnerships between the state and representatives of the fitness industry. This stakeholder approach includes the participation of various ministries, public and private sector institutions, civil society and communities under the auspices of the Ministry of Health.

Depending on the implemented model of promoting a healthy lifestyle, different states receive different indicators of the quality of life of their population. Table 4.1 (Appendix 4) shows the characteristics of the quality of life indicators of individual countries before the COVID-19 pandemic.

According to Table 4.1, the healthiest nation in 2019 was Italy (Europe), the highest life expectancy was in Finland (Europe) and in the USA, the highest death rate was in Russia.

These indicators are influenced by many factors: the economy, innovations, the level of health care costs, the climatic and environmental conditions of the country. But among the global factors, one can also highlight the scale of the organization of healthy lifestyle promotion at the state level.

On the one hand, the data from Tables 3.1 and 4.1 are encouraging, because at the beginning of 2019, the level of health of the population of these countries was high, which confirms the effectiveness of previously implemented programs and methods of preserving the health of nations. Therefore, it was natural to reduce the share of costs (for supporting HLS, it is enough to establish a regular average level of costs, since their increase from year to year is not economically justified). On the other hand, the expenditures of states on combating the pandemic and providing urgent measures for prevention and treatment were attributed to another item of expenditure of the national budget, since this fact and the rapid development of the disease could not be predicted by any forecasts and patterns.

Thus, we can formulate the third hypothesis of the study:

\[ H3: \text{The higher the health indicators of a nation, the more resistant the country’s population is to the effects of pandemics.} \]

But the most important question and the hypothesis of this study is as follows:

\[ H4: \text{Adherents of a healthy lifestyle are less likely to get sick with coronavirus than those who do not monitor their health at all.} \]

5. Methodology

The study was conducted in several stages. At the first stage, statistical information was collected from secondary sources. The focus of the study was on Russia and China, plus several countries of the European Union (Germany, Italy, France and Finland) and the United States were selected for comparison and demonstration of global trends.
Key indicators for data collection include: current population, life expectancy, death rate, health grade, the share of the health budget in % of GDP, number of coronavirus cases, the number of deaths from coronavirus, the number of people who recovered from coronavirus.

At the second stage, a survey of Russian (780) and Chinese (450) respondents was conducted (by means of an online questionnaire in Google-forms and written answers in various messengers and social communities). The questionnaire was developed in strict accordance with generally accepted procedures (Churchill, 1979). The questionnaire includes 4 blocks: (1) how the respondent understands the HLS concept, and its place in his life; (2) the role of the government in the HLS promotion; (3) personal estimation of the coronavirus situation; (4) social and demographic profile.

The quantitative stage of the study, based on the data obtained from a survey of representatives of various communities in social networks, students and just random respondents in Russia and China, was conducted in the period from October to December 2020 — among Russian respondents, and in the period from May to July 2021 — among Chinese respondents. Thus, a sample for two periods (2020 and 2021) was obtained, which covers two nations and almost all age categories from 18 to 60 years. The main characteristics of the resulting sample are presented in Appendix 5, Table 5.1.

At the quantitative stage of the study, the questions were designed to measure three aspects of the relationship between the role of the HLS concept in the respondents’ life and the situation with the COVID-19 pandemic: adherence to the HLS concept; the share of expenditures for maintaining health in personal budgets; and the number of people in the respondent’s immediate environment who got sick with coronavirus.

The question was formulated as: “Can you say that the HLS concept is about you?” A 3-point scale was used for the answers, where: 0 — I only follow the principles of a healthy lifestyle from time to time or absolutely not; 1 — it is difficult to determine or 50/50; 2 — I follow many principles, but not regularly or this is definitely about me.

To assess the share of expenditures for maintaining health in personal budgets of respondents, the question was formulated as: “Determine (approximately) how much of your monthly budget you single out for keeping your health (doctor’s fees, wellness procedures, purchase of medicines, sports and physical culture, healthy leisure, etc.).” A scale from 0.0 to 1.0 was used for the answers and four variants of budget shares were provisionally identified: 1 — less than 10%; 2 — 10–25%; 3 — 1/3 of the budget; 4 — more than 50%.

To identify the number of people infected with coronavirus in the respondent’s close environment, a direct question was formulated: “During the COVID-19 pandemic (waves 1 and 2), in your environment: no one got sick (0 people); some people got sick among my friends, but there are not many of them (from 1 to 5 people); many people got sick with coronavirus (more than 5 people).”

During the analysis, the Gretl OLS model was used (ordinary least squares), in which the dependent variable is the logarithm of the share of the respondent’s personal budget allocated for health preservation ($l_{expe}$), while the number of coronavirus cases in the respondent’s close environment was chosen as the independent variable.
(covid). Also, for the accuracy of the model, an additional fictitious variable was added - the respondent’s adherence to the HLS concept (hls), according to the thesis that the more a person monitors his health, the more money he spends on preserving it.

After standardized and non-standardized regression coefficients were determined, the equation of the model has the following form:

$$\hat{Y}_i = \beta_0 + \beta_1 * \text{covid} + \beta_2 * \text{hls}. $$

Non-standardized coefficients were used to test the hypothesis, and standardized coefficients were used to determine the aspects that had a greater impact on the effectiveness of healthy lifestyle during the pandemic.

6. Results of hypothesis testing

The questionnaire is presented in Appendix 6. It reflects the results of the survey of Russian and Chinese respondents regarding the HLS concept — questions 1, 2, 4.

According to H1, the traditional concept of a healthy lifestyle (China) is more effective than the adaptive one (Russia), which leads to a higher level of health of the nation in the modern period.

Based on the data obtained, the following can be summarized:

a) In the perception of the Chinese respondents, the HLS concept is more fragmented — there is an almost uniform distribution of responses on the HLS aspects. At the same time, 74.4% of the Russian respondents perceive a healthy lifestyle as a single and integral system;

b) Almost three-quarters of all respondents believe that the HLS concept is available to everyone, given the will, as today there are thousands of programs with different levels of strictness of compliance with the principles of healthy lifestyle concepts available to various categories of citizens both in Russia and in China;

c) In general, 57.6% of respondents in Russia and 48.9% in China adhere to the HLS concept in their life; almost 25% of respondents from both countries do not follow the HLS principles; and the percentage of those who are “not sure” is higher in China (it is necessary to strengthen the influence of the promotion of the healthy lifestyle concept on this group of residents in order to increase the values of the health indicators of the nation).

In general, the results of data obtained confirm Hypothesis 1 of this study.

To confirm Hypothesis 2, the second set of the questionnaire was used, which contained the perception of the HLS promotion by the respondents and their assessment of the government’s contribution in the formatting of the HLS concept at the national level — questions 3, 6, 7, 8 (Appendix 6).

It is important to note that 26.9% and 28.9% of Russian and Chinese respondents, respectively, perceive the HLS promotion as commercial advertising, and only 10.3% and 17.8 of them perceive it as a direct motivation to action. In China, the promotion of the HLS concept is more effective.
Promotion of a healthy lifestyle in Russia and China: The first results of COVID-19

Source: calculated by the author based on data for 2020–2021.

**Figure 1.** Perception of the HLS concept by Russian and Chinese respondents (%)

A distinctive feature of the perception of the HLS promotion in Russia and China is the difference in methods (Figure 2).

- for Russians — social networks and communities (35.9%); preventive conversations in schools, universities, at work, in medical institutions (26.9%); and blogging (21.8%);
- for Chinese — social networks and communities (44.4%); outdoor advertising and posters (17.8%); television (13.3%).

### In your opinion, a healthy lifestyle is...

<table>
<thead>
<tr>
<th>Perceived by HLS</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>available only to people with a high income level</td>
<td>43.60%</td>
</tr>
<tr>
<td>not available to everyone, as it is always a big problem</td>
<td>29.50%</td>
</tr>
<tr>
<td>available to everyone, the expenses do not matter</td>
<td>37.80%</td>
</tr>
<tr>
<td>available to everyone, if it does not require too much effort</td>
<td>53.80%</td>
</tr>
</tbody>
</table>

### Can you say that the HLS concept is about you?

<table>
<thead>
<tr>
<th>Perception</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>absolutely not</td>
<td>10%</td>
</tr>
<tr>
<td>sometimes I follow HLS principles</td>
<td>24.40%</td>
</tr>
<tr>
<td>difficult to determine: 50/50</td>
<td>23.10%</td>
</tr>
<tr>
<td>follow many principles, but not regularly</td>
<td>26.70%</td>
</tr>
<tr>
<td>absolutely yes</td>
<td>74.4%</td>
</tr>
</tbody>
</table>

### What definition of healthy lifestyle suits you the most?

<table>
<thead>
<tr>
<th>Definition</th>
<th>Russia</th>
</tr>
</thead>
<tbody>
<tr>
<td>system of rules and habits for preserving health</td>
<td>41.10%</td>
</tr>
<tr>
<td>healthy nutrition and frequent outdoor activities</td>
<td>22.20%</td>
</tr>
<tr>
<td>support and improvement of health</td>
<td>26.70%</td>
</tr>
<tr>
<td>regular sports activities</td>
<td>16.70%</td>
</tr>
<tr>
<td>no bad habits</td>
<td>11.30%</td>
</tr>
</tbody>
</table>

Source: calculated by the author based on data for 2020-2021.

**Figure 2.** Perception of the HLS promotion by the respondents and their assessment of the government’s contribution in the formatting of the HLS concept at the national level (%)

Hypothesis 2 (HLS promotion is effective if it is initiated and controlled by the government) is confirmed.

Appendix 7, Table 7.1 shows statistical data on the spread of coronavirus in the analyzed countries as of 25.01.2021.

As can be seen from Table 7.1, the United States, Russia and France account for the largest number of COVID-19 cases (per 1000 citizens), while Finland and China account for the smallest number of infected people. The maximum number of people died from COVID-19 in the United States and Italy, the smallest — in Finland and China; the United States and Russia have dealt with the virus in the most efficient way.

According to $H_3$, the higher a nation’s health indicators, the more resistant the country’s population is to the effects of pandemics. The national level of health care in China is 42.3% higher than in Russia, and the death rate in the normal period (before the pandemic) exceeds the Russian 3 times. At the same time, 2.58% of the Russian population is infected with coronavirus and 0.05% died; as for China, only 0.01% of the population died. In general, the results of comparing the key indicators confirmed Hypothesis 3 of this study.

The task of the final stage of the study was to confirm Hypothesis 4 using econometric calculations and checking the OLS of the model.

The equation of the model has the following form:

$$ l_{expe} = -2.12 + 0.0209 \times covid + 0.114 \times hls + \varepsilon, $$

$$(0,0509) (0,00631) (0,0319),$$

$n = 1181, R^2 = 0,022$

(standard errors are indicated in parentheses).

Standardized and non-standardized regression coefficients were determined (Appendix 7, Table 7.1).

The coefficient for independent variable $covid$ is positive and statistically significant at the significance level of 10%, which means that it is possible to reduce the risk of contracting coronavirus by increasing health care expenditures by 2%, all other things being equal. In addition, the significance level is high for the $hls$ variable (follow the HLS concept), which indicates that this variable has an impact and is correctly included in the model. But a low $R$-squared indicates that there are other important factors that were not taken into account in this model (this point is not in the focus of this study, but the expansion of the model factors can become the basis for future research on this subject).

Hypothesis 4 (Adherents of a healthy lifestyle are less likely to get sick with coronavirus than those who do not monitor their health at all) was not confirmed.

Conclusions

An important result of the study can be formulated as follows: Regardless of the economic level of development of the country and the intensity of HLS promotion, countries with a larger population are at the highest risk of rapid spread of the virus. In such countries,
the most effective measures to contain the pandemic are restrictive measures, such as self-isolation and a strict ban on staying in public places for a long time.

In 2021, the situation with the pandemic is gradually improving and the trend towards expanding the scale of a healthy lifestyle and improving the health of the population of the studied countries will be more effective if the following measures are implemented and updated at the level of national projects aimed at supporting and preserving the health of nations:

1) It is necessary to continue the promotion of HLS (increasing the number of sports sections, fitness centers, swimming pools, running and cycling marathons) as the main task of state programs to preserve the health of the nation;

2) It is necessary to organize state support for manufacturers of smart watches and fitness trackers as important and innovative tools for monitoring the health of the population (both on the part of state health authorities and personal control of citizens over their own health). During the pandemic, the number of people who began to play sports on their own instead of visiting gyms has increased, and wearable devices will help them track physical activity, pulse and other body indicators. These devices will allow us to improve the monitoring of the state of health of the nation as a whole, as the transmitted data on the state of health of people will allow us to identify at an early stage trends in deteriorating public health at the local, regional and national levels;

3) It is necessary to organize interaction of developers of health and fitness devices with health authorities in order to strengthen the effectiveness of implemented programs to preserve the health of the nation.

Today the HLS promotion is more relevant than ever. The health scenario is at a unique crossroads as the world is facing a “triple burden of disease” formed by an unfinished agenda of infectious diseases, new and emerging diseases, as well as an unprecedented increase in non-communicable chronic diseases and pandemics.

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Appendix 1

Source: compiled by the author.

Figure 1.1. Research design for the bibliometric study

Appendix 2

Source: (Jan, 1990).

Figure 2.1. Hierarchy of systems — levels of the system complex
Table 2.1. 7 levels of the system of human relations with the surrounding world (Chinese HLS concept)

<table>
<thead>
<tr>
<th>No</th>
<th>The system of human’s relationship with the world</th>
<th>Levels of development</th>
<th>Human needs</th>
<th>Levels of the psychological system research</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Man and the world of universal human relations</td>
<td>Levels of social</td>
<td>Developing</td>
<td>Psychoconceptual (worldview: purposeful</td>
</tr>
<tr>
<td></td>
<td></td>
<td>development</td>
<td>(evolution of being) human development)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Man and the world of public relations</td>
<td></td>
<td>Universal values</td>
<td>Psychoenergetic (values of personality culture: creative development, awareness and application of general patterns of development in one’s life)</td>
</tr>
<tr>
<td>5</td>
<td>Man and the world of collective relations</td>
<td></td>
<td>Self-actualization</td>
<td>Psychosocial (collective creativity: professional maturity and the development of creative restructuring of the external world)</td>
</tr>
<tr>
<td>4</td>
<td>Interpersonal communication</td>
<td>Transfer from individual to general</td>
<td>Recognition and respect</td>
<td>Psychogenetic (the ability to integrate with others, factors and incentives for improvement and development)</td>
</tr>
<tr>
<td>3</td>
<td>Man and the information world</td>
<td>Levels of individual development</td>
<td>Cognitive needs</td>
<td>Psychocognitive (mental development: the ability to think, manage circumstances, concentrate thoughts, plan activities)</td>
</tr>
<tr>
<td>2</td>
<td>Man and the world of emotions, feelings</td>
<td></td>
<td>Care needs</td>
<td>Psychoemotional (emotional and sensitive development)</td>
</tr>
<tr>
<td>1</td>
<td>Man and the material world</td>
<td></td>
<td>Biological needs</td>
<td>Psychophysical (physical health, hygiene and everyday life, nutrition and material safety)</td>
</tr>
</tbody>
</table>

Source: (Jan, 1990).
### Appendix 3

#### Table 3.1. HLS promotion models in different countries (before and after 2019)

<table>
<thead>
<tr>
<th>Country</th>
<th>Parameters</th>
<th>Main focus of promotion at the government level</th>
<th>Main legislation on HLS promotion</th>
<th>HLS programs</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>Country</th>
<th>Main focus of promotion at the government level</th>
<th>Main legislation on HLS promotion</th>
<th>HLS programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>obesity</td>
<td>For comparison, data for the US and the EU</td>
<td>Physical Activity Guidelines for Americans, Dietary Guidelines for Americans, A Public Health Action Plan to Prevent Heart Disease and Stroke, Healthy Communities, Let's Move, The Million Hearts Initiative, National Initiative to Improve Adolescent Health, National Prevention Strategy</td>
</tr>
<tr>
<td>EU (Germany, Italy, France, Finland)</td>
<td>high-quality service for patients/users focused on health promotion (the role of medicine in the concept of healthy lifestyle) oncological diseases</td>
<td>Treaty on the Functioning of the European Union (Article 168 “On Health Care”); Decision on an Action Plan to Fight Cancer; Decision on the European Union’s Program for the Prevention of AIDS and Some Other Infectious Diseases; Decision on the European Union’s Actions in Relation to Rare Diseases</td>
<td>Project “Health promotion in primary health care — general practice and community pharmacy”</td>
</tr>
</tbody>
</table>

For comparison, data for the US and the EU:
- EU (Germany, Italy, France, Finland): high-quality service for patients/users focused on health promotion (the role of medicine in the concept of healthy lifestyle) oncological diseases: Treaty on the Functioning of the European Union (Article 168 “On Health Care”); Decision on an Action Plan to Fight Cancer; Decision on the European Union’s Program for the Prevention of AIDS and Some Other Infectious Diseases; Decision on the European Union’s Actions in Relation to Rare Diseases.

**Source:** developed by the author based on (Ball et al., 2013; Field, 1995; Geense et al., 2013, Huffman & Rizov, 2007; Kaner et al., 2018; Roberts et al., 2012; Rtveladze et al., 2012; Rubio-Valera et al., 2014; Sarang, 2007; Stead et al., 2013; Sun et al., 2021; Wang & Zakus, 2016).
### Table 4.1. The share of healthcare in the budgets of Russia and China before and after 2019

<table>
<thead>
<tr>
<th>Countries</th>
<th>2018 (% of GDP)</th>
<th>End of 2019 (% of GDP)</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>9.8</td>
<td>5.3</td>
<td>Health promotion is still underdeveloped but is currently receiving increasing attention in a number of regions</td>
</tr>
<tr>
<td>China</td>
<td>5.4</td>
<td>7.0</td>
<td>Disease prevention is another traditional health issue, but the focus is still on the fight against infectious diseases, and large-scale activities in some provinces are not always based on reliable evidence and cannot reach the right category of people at greatest risk</td>
</tr>
<tr>
<td>USA</td>
<td>22.5</td>
<td>17.1</td>
<td>There is a combination of efforts of the legislative and executive authorities and public organizations to attract people to health-improving motor activity and leading a healthy lifestyle</td>
</tr>
<tr>
<td>EU:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>20.0</td>
<td>11.1</td>
<td>Many aspects of health care intersect with consumer protection and environmental protection measures, the purpose of which is also to protect human health. More attention should be paid to the active involvement of patients and health professionals in the development of research activities, and local and socio-cultural contextual factors should be more carefully taken into account when developing research projects in order to increase acceptability and sustainability</td>
</tr>
<tr>
<td>Italy</td>
<td>13.2</td>
<td>No data</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>14.8</td>
<td>11.5</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>13.3</td>
<td>No data</td>
<td></td>
</tr>
</tbody>
</table>

*Source*: developed by the author based on (WHO. Global Health..., 2018; WHO and World Bank..., 2019).
Table 4.2. Characteristics of the quality of life indicators of individual countries before the COVID-19 pandemic (2019)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Russia</th>
<th>China</th>
<th>USA</th>
<th>EU</th>
<th>Germany</th>
<th>Italy</th>
<th>France</th>
<th>Finland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current population, million people</td>
<td>146.3</td>
<td>1436.6</td>
<td>329.1</td>
<td>83.13</td>
<td>60.0</td>
<td>67.5</td>
<td>5.6</td>
<td></td>
</tr>
<tr>
<td>Life expectancy, year^6</td>
<td>70.3</td>
<td>75.2</td>
<td>80.0</td>
<td>80.7</td>
<td>66.9</td>
<td>81.9</td>
<td>81.5</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>64.6</td>
<td>73.1</td>
<td>78.8</td>
<td>78.2</td>
<td>65.0</td>
<td>78.7</td>
<td>78.7</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>76.0</td>
<td>77.4</td>
<td>81.2</td>
<td>83.1</td>
<td>68.8</td>
<td>85.0</td>
<td>84.2</td>
<td></td>
</tr>
<tr>
<td>Death rate (for 1000 person)^7</td>
<td>24.6</td>
<td>7.4</td>
<td>17.8</td>
<td>9.9</td>
<td>7.1</td>
<td>11.1</td>
<td>9.9</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>35.0</td>
<td>9.5</td>
<td>22.1</td>
<td>13.3</td>
<td>9.1</td>
<td>14.7</td>
<td>13.7</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>14.2</td>
<td>5.3</td>
<td>13.4</td>
<td>6.5</td>
<td>5.1</td>
<td>7.4</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Health Grade^8</td>
<td>26.4</td>
<td>62.5</td>
<td>73.0</td>
<td>83.1</td>
<td>91.6</td>
<td>86.9</td>
<td>85.9</td>
<td></td>
</tr>
</tbody>
</table>

Source: developed by the author.

Appendix 5

Table 5.1. The main characteristics of the sample

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Variety</th>
<th>Russia</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>640</td>
<td>82,1%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>140</td>
<td>17,9%</td>
</tr>
<tr>
<td>Age</td>
<td>18–24</td>
<td>30</td>
<td>3,8%</td>
</tr>
<tr>
<td></td>
<td>25–34</td>
<td>230</td>
<td>29,5%</td>
</tr>
<tr>
<td></td>
<td>35–44</td>
<td>270</td>
<td>34,6%</td>
</tr>
<tr>
<td></td>
<td>45+</td>
<td>250</td>
<td>32,1%</td>
</tr>
</tbody>
</table>

Source: calculated by the author.

The respondents represent such cities as Moscow, St. Petersburg, Chelyabinsk, Murmansk, Nizhny Novgorod, Vologda, Vladimir, Cheboksary, Veliky Novgorod, Ivanovo, Tambov, Tula, Krasnodar, Verkhny Tagil, Tomsk, Yaroslavl, Khimki, Chelyabinsk,


^8 The rating uses the values of the integral indicator, where 100 points is the best indicator of the health of the nation, and 1 point is the worst.
Pskov, Magnitogorsk, Ryazan, Samara, Yekaterinburg, Arkhangelsk, Voronezh, and some small cities of Russia; Shanghai, Chengdu, Kaifeng, Zhengzhou, Zhoukou, Guangzhou, and some small cities of China.

Appendix 6

Questionnaire

Dear respondent,

I am conducting a study to assess the impact of healthy lifestyle promotion, government policy in preserving the national health and the role of healthy lifestyle during the COVID-19 pandemic in different countries. I will be delighted if you take part in this study and answer several questions of the questionnaire.

1. What definition of healthy lifestyle suits you the most?
   - no bad habits
   - regular sports activities
   - support and improvement of health
   - healthy nutrition and frequent outdoor activities
   - system of rules and habits for preserving health

2. Can you say that the HLS concept is about you?
   - absolutely yes
   - I follow many principles, but not regularly
   - difficult to determine: 50/50
   - sometimes I follow HLS principles
   - definitely not

3. What, in your opinion, is the role of the government in preserving the health of the nation?
   - preserving the national health is the main goal of the government in implementing social policy
   - the government should create all conditions for development in both the public and private segments
   - the government can influence a healthy lifestyle only with the help of laws and state programs
   - the government should not control and initiate the healthy lifestyle promotion

4. In your opinion, a HLS should be:
   - available to everyone, if it does not require additional expenditures in the personal budget
   - available to everyone, the cost of this does not significantly affect the personal budget
   - not available to everyone, as it always requires large expenses from the personal budget
   - available only to people with a high level of income
5. Determine (approximately) how much of your monthly budget you allocate to maintaining health (doctor’s fees, wellness procedures, purchase of medicines, sports and physical culture, healthy leisure, etc.)
   - over 50%
   - 1/3 of the budget
   - 10-25%
   - Less than 10%

6. When you see ads or healthy lifestyle promotion, what is your reaction?
   - positive — motivates you to a healthy lifestyle
   - neutral — it is difficult for the mass media to convince you
   - negative — annoys you

7. How does the HLS promotion in the mass media work?
   - influences the decision to follow the principles of a healthy lifestyle
   - informs about the opportunities and ways of maintaining your health
   - forms the correct standard of a healthy lifestyle in your mind
   - encourages you to use commercial services in the field of beauty and health (this is just advertising)

8. Which method of the HLS promotion, in your opinion, is the most effective?
   - television
   - social networks and communities
   - outdoor advertising and posters
   - print media (newspapers, magazines, brochures, booklets)
   - blogging
   - preventive conversations in schools, universities, at work, in medical institutions

9. What do you think about the importance of a healthy lifestyle during the COVID-19 pandemic?
   - HLS has helped people in your environment not to get sick with coronavirus
   - regardless of the lifestyle, people in your environment were sick with coronavirus with varying degrees of severity
   - people in your environment who follow the principles of healthy lifestyle were sick with coronavirus during the pandemic

10. During the COVID-19 pandemic (waves 1 and 2), in your environment...
    - most people got sick with coronavirus
    - there are people who are sick among friends, but they are few
    - nobody got sick

11. In the post-covid period, your approach to healthy lifestyle can be expressed by the following statement:
    - I often think about preserving my health
    - Disease prevention and healthy lifestyle cannot protect me from pandemics and serious infections
    - If the promotion of a healthy lifestyle is more effective on the part of the state, then the level of health of the nation will be higher
    - Other ___________________________
12. Sex
   • Male
   • Female

13. Age
   • 18–24 years
   • 35–44 years
   • 25–34 years
   • over 45

14. Where are you from (country, city)?

Appendix 7

Table 7.1. Statistical data on coronavirus infection in countries (as of 25.01.2021)

<table>
<thead>
<tr>
<th>Countries</th>
<th>Number of coronavirus cases</th>
<th>% of current population</th>
<th>Per 1000 citizen</th>
<th>Number of deaths from coronavirus</th>
<th>% of current population</th>
<th>Number of recoveries from coronavirus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Russia</td>
<td>3774672</td>
<td>2.58</td>
<td>25.7</td>
<td>71076</td>
<td>0.05</td>
<td>3202483</td>
</tr>
<tr>
<td>China</td>
<td>107329</td>
<td>0.01</td>
<td>0.1</td>
<td>4848</td>
<td>0.01</td>
<td>91735</td>
</tr>
<tr>
<td>USA</td>
<td>25443876</td>
<td>7.73</td>
<td>76.8</td>
<td>424275</td>
<td>0.13</td>
<td>1522909</td>
</tr>
<tr>
<td>Germany</td>
<td>2166636</td>
<td>2.61</td>
<td>26.1</td>
<td>54083</td>
<td>0.07</td>
<td>1881933</td>
</tr>
<tr>
<td>Italy</td>
<td>2485956</td>
<td>4.14</td>
<td>41.3</td>
<td>86422</td>
<td>0.14</td>
<td>1917117</td>
</tr>
<tr>
<td>France</td>
<td>3138498</td>
<td>4.65</td>
<td>45.6</td>
<td>74250</td>
<td>0.11</td>
<td>225267</td>
</tr>
<tr>
<td>Finland</td>
<td>43616</td>
<td>0.77</td>
<td>7.9</td>
<td>655</td>
<td>0.01</td>
<td>31000</td>
</tr>
</tbody>
</table>

Source: developed by author based on (Coronavirus: Table., 2021).

Table 7.2. Model: OLS, using observations 1-1230 (n = 1181)

Dependent variable: l_expe

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>const</td>
<td>−2.11967</td>
<td>−41.63</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>covid</td>
<td>0.0208890</td>
<td>3.311</td>
<td>0.0010</td>
</tr>
<tr>
<td>hls</td>
<td>0.113785</td>
<td>3.567</td>
<td>0.0004</td>
</tr>
</tbody>
</table>

Mean dependent var  −1.911930     S. D. dependent var  0.948161
Sum squared resid   1037.559      S. E. of regression  0.938499
R-squared            0.021938      Adjusted R-squared  0.020277
F(2, 1178)           14.18686      P-value (F)         8.16e-07
Log-likelihood      −1599.302     Akaike criterion    3204.604
Schwarz criterion    3219.826     Hannan-Quinn       3210.342

Note: * p < 0.05; ** p < 0.01; *** p < 0.001.
The development of e-commerce in China during the COVID-19 pandemic on the example of the textile industry

Deng Junzhi,
Lomonosov Moscow State University (China)

Abstract
The purpose of this paper is to analyze the current situation with e-commerce in China’s textile industry and new business models during the COVID-19 epidemic. The author studied the vital problems of the Chinese textile industry from the point of view of electronic commerce. In order to solve research problems, the method of qualitative content analysis was used to classify and summarize the research situation. Data sources include the latest academic papers, industry analytical reports of securities research institutions, reports of consulting companies (Boston Consulting Group, McKinsey & Company, etc.), as well as government and organization documents (ITMF, United Nations, etc.). Based on the research process, it can be concluded that during the COVID-19 period up to the middle of 2021, China’s textile industry experienced four stages, having switched from traditional e-commerce to interested e-commerce. Innovation and digital transformation seem to be necessary conditions for China’s textile industry to overcome the negative impact of the COVID-19 pandemic. Finally, the author puts forward a long-term development trends of the textile industry after the COVID-19 epidemic.

Keywords: e-commerce, COVID-19, textile industry in China.

JEL: L81, O12, O33.

Introduction
In recent years, China has made good progress in the field of fashion and textiles, strengthening its role as the preferred supplier in major markets and maintaining proper coherence with other WTO members (Gail Taylor, 2004).

China is still the base of textile production in the world. Although the value of Vietnamese textiles has been growing rapidly in recent years, the total volume of Vietnamese textiles export is still relatively small. In 2019, Vietnam’s textile exports accounted for 27.5%
of China’s textile exports. In other words, the volume of textile exports from China is four times the volume of exports from Vietnam. Thus, in absolute quantitative terms, China remains the main base of textile production worldwide.

COVID-19 first attacked China in late December 2019. The virus is highly contagious and transmitted by airborne droplets and aerosols (Howard et al., 2021). In order to control the pandemic of COVID-19, governments of various countries recommend maintaining social distance and wearing personal protective equipment, and in some cases, they also impose restrictions on commercial and social activities (CDC, 2020).

The global COVID-19 epidemic has had the following important impact on the textile industry.

Firstly, the disruption of the global textile supply chain has led to many complicated problems. When China, the world’s most significant textiles and clothing manufacturer, was hit by COVID-19 for the first time, a strict blockade led to a delay in manufacturing supply chain. Such delays are particularly challenging for the industry because most fashionable products are seasonal. Then, when the virus was detected in most countries around the world in March, the cancellation or delay of large orders affected suppliers in China, Bangladesh and India (ITMF, 2020). Even the textile industry, which later resumed its business in China or South Korea, is still facing multiple problems.

Secondly, the COVID-19 pandemic has seriously disrupted the market of textile. According to a report by the International Federation of Textile Manufacturers (ITMF), during the period from May 20 to June 8, 2020, average number of orders and expected turnover decreased by 42% and 32%, respectively (ITMF, 2020).

Executives predict that fashion garments sales in the United States could fall by more than 50% this year due to the COVID-19 pandemic (Freeman, 2020). Moreover, according to industry practitioners and researchers, the pandemic will have a long-term impact on the industry (Lu, 2020).

2020 is a far-reaching year for the textile industry. The COVID-19 pandemic has put pressure and created challenges for the sales terminals of the industry and operational capabilities of companies. And at the same time, it has accelerated the process of reforming and optimizing the entire industry. Being one of the typical traditional industries, the textile industry has experienced a long process of innovation, destroyed its business and revived its vitality in the face of new opportunities (Ju & Yang, 2021).

1. Review of the literature on e-commerce in textiles

E-commerce is a process in which consumers purchase goods and services via the Internet. Information about goods and services is published on an Internet platform, and customers can get it from there (Wienclaw, 2008).

Panigrahi and Joshi (2016) define e-commerce as the use of electronic communications and digital information processing technologies in commercial transactions to create, change and redefine value creation relationships between organizations, as well as between organizations and individuals.
Since the advent of the Internet and e-commerce in the mid-1990s, a lot of research have been conducted on the impact of e-commerce on a company’s operating model and on the changes that it will make to the overall structure of the global economy (Hodge & Cagle, 2004).

E-commerce can become the leading way of improving the efficiency of daily business transactions, while the Internet is a new way to communicate with customers and suppliers. Since 1998, the Chinese government has attached great importance to the development of e-commerce, providing high-level guidance and creating a better environment for e-commerce.

The article “E-commerce in production: Some experiences” by Dignum (2002) classifies services that e-commerce provides to customers. These categories include customer and supplier management models, sales support and online catalog models. For example, the customer management model relies on the use of information received from customers to improve their relationship with the company. Companies can use the Internet to obtain information about their products and transactions from customers, which allows them to better serve customers and helps in building closer relationships with them.

Rogers (1995), Nelson and Shaw (2003) studied innovation factors in the past. In their research, the innovative attributes of e-commerce include comparative advantages, compatibility, and ease of use. A comparative advantage refers to whether companies believe that e-commerce will give them an advantage over previous business methods. Compatibility here evaluates whether these companies regard e-commerce systems as compatible with their current business processes.

Lin (2008) found that, compared to previous generations of technological innovation, E-commerce has new features, so the impact of innovative features is worthy of attention, but it has not been fully recognized in the research of e-commerce application.

According to Thatcher and Oster (2002), government policy is a key factor that encourages enterprises to adopt B2B e-commerce.

Hodge and Cagle (2004) divided e-commerce models into the following types: procurement model, ownership model, service-based model, customer relationship management model, interaction model, revenue model, and supply chain model. E-commerce plays a vital role in the current situation in the textile and garment industry, and supply chains are implementing a variety of e-commerce applications. (Panigrahi & Joshi, 2016) Like most other industries, the textile industry uses a combination of the above e-commerce models.

Zeng and Xu (2010) also pointed out four advantages of popularizing e-commerce in textile industry: significantly reducing the cost of building a logistics system; reducing the intermediate link between garment manufacturing and retail; reducing the turnover; reducing the inventory; and increasing transaction efficiency. Enterprises can directly obtain customers’ approval through customer information, as well as internet-based market research and analysis, carry out promotion, quickly adapt to market changes, and meet individual consumer demand. E-commerce makes clothing enterprises ready for integration into the international market, destroys the monopoly and price barriers.
In a word, implementing information management and network marketing will bring unlimited business opportunities for the long-term development of Chinese textile enterprises. This is due to the fact that e-commerce in textile industry has become one of the basic forms of textile market.

2. Situation in the Chinese textile industry during the COVID-19 pandemic

Throughout the COVID-19 epidemic, China’s textile industry has gone through four stages.

- **Stage 1:** Before April 2020 (domestic market was hit)
  - Domestic production was suspended
  - Logistics was stopped

- **Stage 2:** In May 2020 (Overseas markets are affected)
  - New overseas orders dropped significantly
  - Utilization rate of many factories dropped

- **Stage 3:** At the end of September 2020
  - Domestic pandemic situation is under control, consumer demand has recovered first
  - Epidemic in India became worse and orders continued to flow to China

- **Stage 4:** After 2021
  - Domestic pandemic situation is absolutely under control
  - In the medium and long term, domestic enterprises are ultimately looking to upgrade their industries and outsource low-and medium-end orders.

*Source:* compiled by the author.

**Figure 1.** Four stages the textile industry in China has gone through during the COVID-19 pandemic

**Stage 1:** Until April 2020, domestic production was suspended, and logistics was temporarily stopped. In addition, orders in the domestic market were postponed or reduced. As a result, the impact of a sharp decline in new orders was felt, and this to some extent affected the scale of the industry’s revenues.

**Stage 2:** Due to the ongoing spread of the pandemic abroad, the number of new foreign orders dropped sharply. After the initial orders were processed in May 2020, the utilization rate of many factories fell sharply.

**Stage 3:** The epidemic situation in China was brought under control, and consumer demand took a leading role in recovery. However, with demand recovering, the recruitment situation in the entire textile and garment industry chain was not ideal, which also caused some shortage of production capacity. At the end of September 2020, it turned out that
orders affected by the Indian pandemic continued to arrive in China. At that time, this part of the orders was delivered in small quantities. However, if the work on the prevention of the pandemic in India continues, more orders are likely to be received in China.

Stage 4: The Indian pandemic broke out twice in 2021 and spread to East Asia and South Asia. India’s low-end manufacturing orders were the first to return to China, bringing short-term benefits to this industry. In the medium and long term, domestic enterprises are finally striving to modernize and outsource low-end orders. However, the return of orders will not have a long-term influence on domestic enterprises.

The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The manufacturing enterprises are mostly engaged in export, and their core competitiveness is mainly manifested in technological research and development capabilities, supply chain management capability, energy production, scale effect, and so on.

The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies. The textile manufacturing industry is strongly influenced by the prices of commodities, such as cotton and oil. Like the manufacturing industry, it has a certain periodicity and is mainly export-oriented. Therefore, it has a significant impact on labor force, fixed assets, production efficiency, production scale, exchange rate, and environmental protection policies.

The pandemic has driven the rise of new retail formats in terms of channel, and the structural migration of traffic has led to changes in channels. As a result, the Internet has become a stable and sustainable consumer environment, and at the same time, it has accelerated the process of innovation and optimization of offline channels.

As far as demand is concerned, due to the COVID-19 vaccination schedule, the probability and severity of its further outbreak in Europe and the United States are expected to decrease, and the expectation of a recovery in demand is gradually being verified.

As for supply, in 2020, the total value of textiles and garments exports was about $291.222 billion, an increase of 7.24% year-on-year, of which the export of textile yarns, fabrics and products increased by 11.67% in December, which was mainly due to the effective control of the epidemic situation in China since March 2020, and the fact that domestic textile enterprises resumed work and fulfilled export orders before the Spring Festival. The growth in the export of epidemic prevention products (masks, etc.) led to a considerable growth of exports. However, due to the spread of the pandemic abroad, consumer demand for foreign clothing was weak. From January to May 2021, the textile and clothing export totaled approximately US$ 112.7 billion, which is 17.19% more than in 2020, and 13.16% more than in the corresponding period of 2019. Thanks to the orderly introduction of the vaccine, the growth in exports of clothing and clothing accessories was 48.15% year-on-year in 2020, which is 10.40% more than in 2019.

As for the supply chain, the brand characteristics of the mass apparel segment determine the core competitive advantage of the supply chain, and the importance of supply chain flexibility is further highlighted under the pressure of the pandemic. The parent company builds on the previous supply chain experience, creates and follows up positive innovations, strengthens consumer insight, transfers end-user data to the
product development department (C2M\(^1\)), and relies on a fast counter-supply chain to replenish goods in time, so as to grasp the market demand and fundamentally improve the health and effectiveness of operations.

3. Traditional e-commerce vs. interested e-commerce in China

The wide popularity of the Internet has driven a rapid growth of online consumption. In recent years, China’s Internet industry has been developing rapidly. The number of Internet users and the level of Internet penetration have increased, creating an extensive user base for online shopping. According to the China Internet Network Information Center, by the end of 2020, the number of Internet users in China reached 989 million, representing a year-on-year increase of 9.40%, and the number of online shopping users reached 782 million, representing a year-on-year increase of 10.16% and accounting for 79.10% of online users. Online shopping has become an essential way of consumption for Chinese consumers. The huge number of online consumers led to an increase in the scale of online retail. According to the National Bureau of Statistics, online retail sales of physical goods in China reached 9.76 trillion yuan in 2020, an increase of 14.49% year-on-year. Online retail sales of physical goods accounted for 24.90% of the total retail sales of social consumer goods, an increase of 4.20 percentage points year-on-year (Mi & Zuo, 2021).

The main traditional e-commerce platforms in China are Taobao (the e-commerce platform of Alibaba), JD.COM, and Pinduoduo. In 2020, the “second outbreak” of live stream e-commerce became a new growth point, and live stream became a “new infrastructure” for e-commerce, merchants, brands, etc. Affected by the COVID-19 pandemic, live streaming of goods reached a new height. Taobao, JD.COM, Kwai and TikTok, as well as many offline merchants, joined the group, accelerating the development of live streaming.

The pandemic has replaced offline with online, further promoting the development of the e-commerce model. The importance of e-commerce channels skyrocketed, and the normalization of new retail helped sales, marketing and operation. At the early stage of the epidemic, when offline traffic broke into the online market, various channels, such as live streaming of online celebrities, micro-store applets and APP, continued to expand, and Internet content marketing, such as KOL promotion and social media soft text promotion, became the norm.\(^2\)

During the COVID-19 pandemic, live e-commerce providers continued to expand the online consumption space and became an important support for online consumption. E-commerce, as a commercial application of live streaming, means that the presenter

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\(^1\) C2M: Customer-to-Manufacturer. C2M mode refers to users directly connecting with manufacturers, i.e. consumers directly connecting with factories, emphasizing the connection between manufacturing and consumers.

introduces, demonstrates and promotes goods or services for the sake of concluding a transaction, and communicates and interacts with consumers using real-time audio and video.

As an innovation in online consumption, live e-commerce providers began to activate users’ consumer perception\(^3\) by “strongly recommend” and real-time interaction, effectively meeting the diverse needs of consumers, increasing the purchase conversion rate and user experience, and became an important support for online consumption (Ju & Yang, 2021).

According to the data of China Internet Network Information Center, by the end of 2020, the number of online live stream users in China reached 617 million, an increase of 10.19% year-on-year, of which the number of online live stream users was 388 million, an increase of 46.42% year-on-year. Furthermore, consumers buying goods online in real time accounted for 66.2% of the total number of users of online trading in real time, and for 17.8% of the online real-time consumers live online purchases accounted for more than 30% of their online shopping consumption (CNNIC, 2021).

Source: compiled by the author.

Figure 2. Development of the e-commerce model in China’s textile industry

The difference between traditional e-commerce and interested e-commerce can be summarized by the slogans “people are looking for goods” and “goods are looking for people.” The traditional e-commerce model refers to the “people are looking for goods” slogan, and its typical way is “demand-search-purchase.” First, consumers form a certain demand, then they go to an e-commerce platform to search for it and select preferred goods and businesses in the shelf-like scene, in order to develop the habit of shopping online. This method is characterized by a long chain of making purchasing decisions and low level of connection between merchants and consumers. At the same time, the model

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\(^3\) Consumer perception — a process by which consumers sense a marketing stimulus, and organize, interpret, and provide meaning to it.
of interested e-commerce refers to the “goods are looking for people” slogan. Its typical way is “interest-demand-purchase.” The platform first aggregates traffic and accurately recommends short commercial videos and live content to stimulate user interest. In this case, users can make quick purchasing decisions. After purchasing high-quality goods, users will settle down and become fans of the anchor, which will lead to repeated purchases (Mi & Zuo, 2021).

Source: compiled by the author.

**Figure 3.** The typical ways of traditional (left) and interested (right) e-commerce

To sum up, Taobao (Alibaba) live streaming is mainly aimed at young and middle-aged women with good financial resources and relatively high consumption level. TikTok’s live streaming is targeted at a wide range of audiences, including young and middle-aged women with good financial resources, as well as other young people, such as university students and young professionals. The geographical distribution of TikTok live streaming users is also relatively wide, and demographic factors have a great influence on the number of users. TikTok live streaming has a wider target audience and broader geographical distribution, which can provide an increment of new channels for the development of live e-commerce (Lin, 2021).

Live streaming of e-commerce is developing explosively, and the market scale is expected to exceed 100 billion yuan. In 2019, Li Jiaqi, the head anchor of a phenomenal TV show, used the catchphrase “OMG, buy it” to become popular throughout the network. In 2020, the social isolation caused by the COVID-19 pandemic led to the rapid development of live e-commerce.

**4. Business logic of live e-commerce**

(interested e-commerce)

Against the background of the COVID-19 pandemic, TikTok has taken advantage of live e-commerce.

TikTok e-commerce clearly defines the platform of “interested e-commerce.” On April 8, 2021, at the first e-commerce ecological conference, the president of TikTok e-commerce, Kang Zeyu, first explained the concept of “interested e-commerce,” which represents
an e-commerce based on people’s desire for a better life, satisfying users’ potential interest in shopping and improving the quality of life of consumers.

According to a survey conducted by TikTok e-commerce, consumers do not have a specific purchase plan before shopping, but they get excited by products when browsing through them. TikTok defines this model as “e-commerce with interest,” and it is estimated that the transaction volume of e-commerce with interest will reach 9.5 trillion yuan in 2023, which will serve as a platform for the positioning and development of TikTok’s e-business. The recommended technology links the product content to potential customers. Compared to traditional channels, such as e-commerce and offline shopping, TikTok e-commerce providers connect high-quality product content with many interested users through recommendation technologies, which stimulates new experiences and new user consumption requirements and brings a new volume of business to sellers.

On the one hand, short TikTok videos and live streaming integrate commercial information into real and vivid content scenes, which enhances the wealth of commodity information, fully displays the sales points and the history of product brands and maximally stimulate consumer interest in consumption. On the other hand, recommendation technology can provide positive feedback from users, purchase and repeated purchase of content and commodities, so that the content of commodities can be recommended to a larger number of users with the same interests, thus promoting discovery of a product and its consumption.

Source: compiled by the author.

Figure 4. The essence of e-commerce at TikTok

Being the owner of a huge user base and an advanced intelligent recommendation algorithm, TikTok started to develop an e-commerce business. In March 2018, TikTok began providing shopping channels for accounts with millions of fans and added a link to the Taobao page in the shopping cart function. In December of the same year, TikTok delivered the goods for Tmall Shuang 12 e-commerce festival, resulting in as many as 1.2 million transactions. After the success of this small test, TikTok accelerated the speed of goods delivery. In April 2019, TikTok launched e-commerce applets, such as “Xiaomi Mall” and “JD.COM Haowu Street,” further expanding TikTok’s e-commerce business.

Affected by the pandemic, live e-commerce is taking advantage of TikTok and the e-commerce ecosystem is rapidly developing. On April 1, 2020, Luo Yonghao’s live stream on TikTok platform resulted in more than 110 million RMB trading volume in three hours. Many stars and celebrities, such as Luo Yonghao, started bringing goods
to TikTok for live streaming. The consumption of TikTok’s content-based sketches skyrocketed. TikTok is increasingly feeling the benefits of e-commerce industry. On June 18, 2020, ByteDance announced the establishment of an e-commerce department, which allowed to begin competing with Taobao, JD.COM and other platforms in the field of e-commerce in the “short video, live broadcast+e-commerce” model. In August 2020, the total turnover of TikTok Wonderful Fair exceeded 8 billion yuan, and the first platform significantly contributed to its success. On October 9, 2020, TikTok Live officially terminated its cooperation with third-party e-commerce platforms, having completed a full closed loop “direct-broadcast — commerce.” In January 2021, the turnover of the TikTok New Year Festival reached 20.8 billion yuan, and merchants, talents, service providers and institutions were formed beforehand. The capabilities of products, services and data of e-commerce has stood the comprehensive test. According to the statistics of Capital state,4 in 2020, the total volume of TikTok e-commerce transactions exceeded RMB500 billion. The annual turnover target for 2021 will be raised to RMB1,000 billion (CNNIC, 2021).

Clothing best matches the characteristics of e-commerce in TikTok, among which women’s clothing has the highest sales volume. From the consumer point of view, TikTok e-commerce users are mostly women, and more than half of them live in large cities. Young people born in 1980s and 1990s are in absolute majority, which makes them the main group of clothing consumers. Judging by the product characteristics, clothing commodities are characterized by high gross profit. However, the overall commission rate of live streaming in TikTok is about 20%. In order to ensure the attractiveness of products, consumers are provided with certain discounts or coupons for the live stream. The higher cost of delivering goods requires that the gross profit from the goods reaches a certain level. In addition, TikTok’s e-commerce company can promote all kinds of products with short video/live streams and simulate product usage scenarios.

5. Innovations in China’s textile industry during COVID-19 pandemic

The “stay at home” mode introduced during the pandemic changed consumers’ shopping habits, and the demand for online consumption increased significantly. The development of the MCN market segment, such as live streaming, also affected the purchasing habits of consumers, which are now different from traditional retail. The fixed costs of network franchisees are distinctly lower than those of traditional companies. E-commerce companies communicate directly with customers, avoiding the development and maintenance of offline channels. The “stay at home” mode, which lasted for 1–2 months during the Spring Festival in 2020, also accelerated the process of transformation of retail trade.

4 Capital state — a high-tech enterprise engaged in financial science and technology services (www.ChinaIPO.com).
The size of the market of China’s live video industry increased from RMB6.4 billion in 2015 to RMB108.2 billion in 2019, with a cumulative annual growth rate of 103.0%. It is estimated that from 2019 to 2024, driven by the diverse and high-quality content of live video platforms, as well as greater audience readiness and purchasing power, the market volume will grow at a cumulative annual growth rate of 23.4% and reach 310.1 billion yuan by 2024.

The COVID-19 pandemic accelerated the adjustment process of offline stores, and digital tools improved the quality and efficiency of operations.

1. The offline channel of the industry entered a period of adjusting the store structure before the pandemic. During the pandemic, offline terminals were seriously affected. Different brands took advantage of the situation to accelerate its adjustment by closing low-efficiency small stores and opening large high-quality stores. At the same time, big data at the operation side helps to accurately depict the portrait of users, and technologies allow offline stores to make reasonable decisions, reduce load and improve efficiency.

2. With the increasing importance of DTC (data transmission channels), the share of direct sales channels is on the rise. At the same time, the brand company rationally organized online sales and effectively eliminated inventory.

3. Digitalization of sales reconstructs people, goods and markets at the consumer level and transforms them at the enterprise level, using data processing tools to optimize consumption scenarios and increase sales efficiency.

4. Digitalization of marketing: comprehensive data contacts are distributed online and offline, and after that data analysis is used to obtain information about demand, accurate marketing and optimized experience.

5. Digital logistics forms means to build the whole process of intelligent logistics operation, intelligently dispatch external transportation and improve the efficiency of goods delivery.

6. Digital production establishes a structured product group model, flexibly adjusts each product’s production schedule and creates flexible supply chain capabilities.

7. Purchasing digitalization integrates internal and external high-quality supply resources, forecasts purchasing demand based on data analysis and establishes e-commerce whole-process procurement (Mi & Zuo, 2021).

Alibaba Rhino Intelligent Manufacturing is one of the most successful innovative enterprises in the textile field. An unmanned vehicle of Ali’s own design transports materials back and forth along the mapped track, and the self-developed web system transports various fabrics in an orderly manner. A mechanical hand is responsible for most transmission work, and numerically controlled drawing replaces manual drawing. Workers are responsible for the operation of the machines and meticulous work, in which each of them is good, for example, for writing notes and reviews that can be performed using a tablet computer. “From this reporter’s description, we can find that the assembly lines and equipment of most Rhino Factories are intelligent and highly automated, which not only reduces the labor cost but also improves the transportation efficiency and the

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5 RMB is an alternative name for the yuan (from the Chinese Ren Min Bi — the national currency).
stability of the products produced. Unlike the traditional manufacturing plants, which can only place large quantities of single-item orders at a time, the core capability of “Rhino” lies in customization on demand, starting with 100 pieces and delivery within 7 days at the earliest. This may be the first case when the speed of production in textile industry is approaching the speed of production in the fresh food industry. In the workshop of Rhino Intelligence, an assembly line can produce many different products at the same time, such as shirts, hoodies, and down jackets. According to the employees of Rhino Intelligent Manufacturing, more than a dozen orders can be launched simultaneously within the new manufacturing model. These orders are small, the styles are seasonal and ready-for-sale. Thanks to the C2M ordering model and automated production lines, the Rhino plant can reduce supply chain time by 70% and reduce inventory holding costs by 30%. Although individual designers do not have the ability to build a supply chain platform equal to ZARA’s, but adhering to this model, everyone can have a fast-response supply chain (Zhao, 2021).

6. The rise of China’s domestic textile brand

The reformed China’s economy is growing rapidly. In 2010, China’s GDP surpassed Japan, and China became the world’s second largest economy after the United States. Against the background of the rise of the great powers, national self-confidence gradually increased, which also deepened the patriotic feelings of the Chinese people and their confidence in supporting domestic products. At the same time, the content of social media was biased towards the national original and traditional culture, which had a subtle influence on consumers’ minds.

The return of traditional culture and the increasing public recognition of culture have gradually triggered the emergence of a new trend of domestic products. Great cultural variety TV shows, such as Chinese Poetry Conference, National Treasure and Upped New, Old Palace are very popular in China. The number of Chinese-made films in the annual TOP 10 list of cinemas increased significantly. The degree of foreign input to the cultural circle was greatly reduced, while the search for “Chinese-style” costumes significantly increased.

However, with the creation of new media, new channels, such as Sina Weibo, Xiaohongshu and TikTok, appeared, and the communication mode changed from “one-way graphic” to “interactive video live streaming” with more diverse communication channels and presentation methods, and the degree of information transparency was growing day by day. The idea that “China is a global manufacturing factory, and Chinese brands can make good products” began to spread widely. A new generation of consumer groups emerged, which has a stronger national self-confidence and pride and whose growth experience had witnessed China’s economic take-off and the rise of national brands. At the same time, compared to their parents, the new generation of consumers has a higher average education level, better material living conditions and a higher level of Internet penetration. Instead of aiming for “big brands,” they pay more attention to experience,
individuality, and differentiation. Their perception of new things and brands is also higher, which lays a spiritual foundation for the rise of Chinese goods (Yu et al., 2021).

In the medium and long term, rapid economic growth will bring cultural and institutional self-confidence, while media content will tilt towards domestic and traditional culture, which will gradually lead to a new trend of national consumption.

Shopping malls began to favor local brands, making up for the lack of offline channels of local brands, and the rapid growth of e-commerce is also helping local brands to catch up with foreign ones. Changes in the media and the rejuvenation of consumers laid a solid foundation for consumers to give preference to domestic products. The local brand itself is also created based on refined internal skills and fashion innovation, which paves the way for brand evolution.

7. Future trends of e-commerce development

According to the “Southeast Asia E-commerce Report 2020” released by Google, e-commerce has become the largest industry in Southeast Asia, with an increase of 63% in 2020.

McKinsey survey showed that more than 50% of European and American consumers expressed their willingness to continue adhering to their online shopping habits. According to data from the Ministry of Commerce, in 2020, the total sales of e-commerce in the United States reached US$ 759.47 billion, an increase of 31.73% compared with US$ 576.53 billion in 2019. ByteDance is developing a foreign cross-border e-commerce business named “Fuxiang Haigou,” which includes products of well-known brands from more than a dozen countries. Ctrip Global Shopping platform, which specializes in outbound shopping services, was upgraded from the original “online mall” mode to “cross-border shopping,” providing online booking platforms and cross-border direct mail services. Thanks to technologies, the use of cross-border e-commerce will become a strategic choice for enterprises in the future. This will accelerate organizational changes and product upgrade of enterprises and ensure a leading position in the future.

In the future, the scale of the rural market will continue to expand. On the one hand, consumers from the cities of the first and second tiers are beginning to stratify, and the share of consumers pursuing the best price-quality ratio is significantly increasing. On the other hand, thanks to the comprehensive popularization of mobile communication equipment and the increasing development of infrastructure construction, China’s neglected rural market is gradually showing its importance.

In 2020, the Ministry of Commerce continued to promote the comprehensive demonstration of e-commerce in rural areas and created an “upgraded version” of the comprehensive demonstration. E-commerce platforms, such as Taobao and JD.COM noticed a huge empty space in the rural market and the demand for consumption classification in the markets of the first and second levels. Taobao restarted

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https://www.oberlo.com/statistics/us-ecommerce-sales
Juhuasuan and JD.COM launched Jingxi. Both e-commerce giants received fruitful results in the rural market. In the future, live e-commerce will be upgraded. Major e-commerce platforms and live broadcast platforms will continue to increase investment in live e-commerce, and the increased competition will also directly promote the comprehensive upgrading of live e-commerce.

Live e-commerce partially entered the stage of refined operation, and e-commerce presenters are also developing in the direction of professionalism and specialization. In terms of content, platforms, such as TikTok, evolved from simple short videos to medium and long videos, attracting a large number of teams with long videos. In terms of the model, the real-time e-commerce ecosystem was upgraded from original video promoting goods to “video+live streaming.” The short video transmission cycle became longer, which is more suitable for promoting product advertising. Live streaming pays attention to the real-time sales transformation. As for the brand, “video+live streaming” allow better integration of the product and the effect.

In terms of technology, AR/VR, artificial intelligence and other technologies are expected to improve the shopping experience. Alibaba’s Rhino Intelligent Manufacturing, relying on Big Data, stepped into the manufacturing industry and developed C2M manufacturing, realizing the goal of promoting innovation, reducing costs and filling the deficit, opening a new model of manufacturing industry. It is possible to predict that the future business will be consumer-centric, driven by big data, digital and intelligent. Online giants and corporate giants will focus on building a joint fast and flexible supply chain to facilitate deep integration of online and offline channels. Intelligent enterprises, intelligent markets and intelligent sellers will become the main force of the future commercial development, and end-to-end high-efficiency and accurate matching of new businesses will become a reality.

Conclusions

COVID-19 is a “black swan” event. The global medical system and the world economy are facing serious challenges. While people are fighting the epidemic, big changes are taking place in their lifestyles and ideas, and the crisis implies new business opportunities. After the beginning of the epidemic, social isolation and homestay mode changed the consumer habits of global consumers, but the e-commerce economy has developed rapidly due to the epidemic. As a global factory, China’s textile industry is one of the foundations of people’s livelihood. The rapid growth of e-commerce in China’s textile industry after the beginning of the COVID-19 pandemic became a general trend and provided development experience to other countries around the world.

Changing consumption patterns are forcing fashion companies to adjust their strategies. As more and more countries cancel lockdown orders and retail stores gradually reopen, consumers are coming to terms with the reality that they have to live with COVID-19. New consumption patterns are observed in both the wholesale and retail sectors (Berg et al., 2020).
The author of this research conducted a comprehensive study on the e-commerce industry, analyzed the development of China’s e-commerce during the COVID-19 pandemic, compared and analyzed the differences between traditional e-commerce and interested e-commerce in China’s textile industry, put forward the business logic of interested e-commerce, outlined the innovative behavior of the textile industry during the COVID-19 period, and found that domestic textile brands began to grow during the epidemic.

It can be concluded that during the COVID-19 period, up to the middle of 2021, China’s textile industry went through four stages that changed it from traditional e-commerce to interested e-commerce. Innovation and digital transformation seem to be necessary conditions for China’s textile industry to overcome the negative impact of the COVID-19 pandemic. In conclusion, the author proposed a long-term trend of the development of the textile industry after the COVID-19 epidemic.

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Digital shifts in human resource management in the global economy

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Abstract
This article examines the key issues related to digital shifts in human resource management in the global economy. The purpose of the article is to identify the features and key trends in the introduction of digital technologies on the example of the BRICS countries. The study yielded a number of results. In the course of the research, the theoretical foundations of the digitalization of HR management are analyzed. The current situation and the contemporary level of human development in the BRICS countries is also noted. The features and problematic aspects of digital transformations in the human resource management system are outlined on the example of Russia, China and Brazil. In addition, the main digital technologies that are widely used in the countries under consideration are described.

Keywords: human resources, management, digital technologies, human resource management, BRICS, costs, resources.

**JEL:** J08, J18, E24.

Introduction

The modern global economy is focused on continuously increasing productivity in conditions of limited resources. Such changes are caused by the era of uncertainty in world markets, as well as turbulence in the system of economic relations, which contributes to radical transformations in economic systems at various levels. The complex competitive environment in which modern states, regional associations and business entities operate in general is caused by a significant number of aspects, such as globalization,
informatization, the development of the Internet, the economic crisis, instability in the business environment, and the rapid spread of digital technologies (Manuti, 2018).

Currently, there is no doubt that the “digitalization” of business and industry is the core of the “digital” economy and a key driver of growth. The digital space is an extremely effective system of socio-economic relations, and digital technologies directly affect its key element, i.e. added value. Penetrating into many areas of economic activity, digital transformation projects should stimulate attraction of investments, transformation of traditional industries into efficient, high-tech competitive industries, as well as create a whole range of new opportunities for realizing human potential. Consequently, the current economic environment spurs investment in digital transformation, as emerging markets try to increase their demand for technology in order to stimulate further growth, and developed markets are looking for new ways to reduce costs and innovate. In international practice, this situation is called the “circle of prudence and growth” and its essence lies in the fact that digital technologies act as a driver of consumer demand and income, education and training, as well as an incentive for the efficient use of capital and resources, which leads to an increase in economic growth, especially in emerging markets, which include the markets of the BRICS countries (Dey, 2020).

Digital transformation changes the way management is done, transforms change management processes, stimulates digital thinking, and revolutionizes the workforce experience, requiring the actualization of existing HR technologies. The development of a digital strategy integrated with HR management becomes a necessary condition for ensuring the future competitiveness of enterprises by transforming the HR function.

According to the results of studies conducted by international consulting companies analyzing changes in the labor market, it was found that the integration of digitalization with the personnel management system at enterprises is of particular importance and relevance. Every year, more and more companies automate the function of personnel management, thereby simplifying and increasing the efficiency of recruiters and HR managers. Deloitte University Press conducted a survey of respondents who rated the importance of digitalization in HR management. The results indicate that respondents from such countries as India, China and Russia had the highest levels of demand for digitalization in HR services (Figure 1).

However, despite the great demand for digital technologies in the field of human resource management in developing countries, including the BRICS countries, for the most part, the introduction of advanced HR technologies in companies is carried out pointwise and not always consistently. There is a significant amount of disagreement regarding the vision of the need for changes among senior and line management, which, in turn, requires a deep analysis and assessment of the effectiveness of existing experience and the emphasis in the use of HR-management of a new type, which determines the choice of the topic of this article and also confirms its theoretical and practical significance. The purpose of the research is to analyze digital shifts in human resource management taking into account the challenges of the global economy on the example of the BRICS countries.
1. Methodology

The methodological basis of the research is a set of general scientific principles, methods and techniques of scientific cognition, the use of which is determined by the stated purpose of the article. The study is based on the use of the following methods: the abstract-logical method — to generalize theoretical provisions and formulate conclusions; the method of historical analysis and theoretical systematization — to study models of human resource management in different countries of the world and substantiate the conceptual provisions of human resources management taking into account globalization processes and digital technologies; the comparison method — to clarify the features of various approaches to the implementation of digital technologies in HR management; the dialectical method — to establish the relationship between the structural elements of human resources and digital competencies of employees.

2. Theoretical background

In terms of theory, Cascio and Montealegre carried out the retrospective analysis of articles by various authors and experts on the role of information and communication technologies and their impact on the development of effective personnel management in organizational and social contexts (Cascio & Montealegre, 2016). Togt and Rasmussen focused on the successful use of HR analytics in Shell and its representative offices around the world (Togt & Rasmussen, 2017). Diez, Bussin, Lee note that HR analytics solves the problems of strategic development of companies and determines the main forecast trends. Using the LAMP model (LAMP — logic, analytics, measures and process) (Diez, 2019), Soundararajan and Kuldeep (2016) identified the reasons for the lag of

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Figure 1. The importance of introducing digital technologies in HR management in different countries of the world (2017)

the company’s employees in the implementation and active use of digital competencies (Soundararajan & Kuldeep, 2016).

Further development of knowledge in the field of personnel management is justified in the works by Dessler (2011), Gökalp et al. (2020), Stritch and Pedersen (2019), which contributed to the formation of the theoretical basis of this scientific direction in the context of the human resource management system, in which personnel is considered not only as a resource and an element of the structure, but also as the main source of the formation of competitive advantages of the enterprise. A significant contribution to the development of the theory of personnel management was made by the works of Russian scientists, which set out the theoretical and methodological aspects of personnel policy, especially the formation and development of personnel in the conditions of radical transformations of economic systems in the context of digitalization.

The experience of digitalization of personnel policy in the leading countries of the world, studied by Gale and Aarons (2018), and Williams (2020), indicates the need to ensure an effective educational environment and constant investment in training specialists, as well as the importance of solving the key task of creating a favorable digital infrastructure at the enterprise, which will prevent loss of qualified personnel and will contribute to their further professional development. The demand for talented professionals who are well versed in the latest innovations in the digital world continues to outstrip the supply worldwide. Meijerink and Bondarouk (2018), Keegan et al. (2019), Marler and Parry (2016) found that today there is a need for trained professionals who will help improve business processes in digital companies and, accordingly, improve the quality of their products and services.

The generalized definition of digital competence was formulated by Ferrari on the basis of thorough analysis of several national and international projects and initiatives: It is a set of knowledge, skills and attitudes (including abilities, strategies, values and awareness) that are necessary for using information and communication technologies and digital media to accomplish tasks, solve problems, communicate, manage information, collaborate, create and disseminate knowledge that in the aggregate will allow organizing work, joint activities, and will also satisfy consumer needs and ensure high results of the enterprise as a whole.

The publications and developments available to date testify to the growing interest in the problems under consideration in foreign and domestic science. However, scientists mainly pay attention to the theoretical problems of globalization in connection with the prospects for introducing digital technologies into the personnel management and culture of the HR sphere. At the same time, the applied aspects of possibilities and prospects of using digital HR analytics in modern enterprises and, accordingly, the justification of the necessary resources for monitoring and identifying data in the projections for the selection, assessment and development of talents remain without attention.

In addition, research does not pay enough attention to ways of achieving the “maturity” of employees of enterprises and organizations in order to use digital technologies to increase their productivity.

Thus, the transformation of approaches to personnel management under the influence of the opportunities of the digital economy is increasingly accelerating, which requires
a deeper study, systematization and assessment, as well as determining the directions for dissemination and application of digital HR in the activities of enterprises, taking into account advanced information technologies.

3. Results

In general, the use of digital technologies in human resource management involves the use of social networks and digital platforms, big data analytics tools, cloud services, artificial intelligence capabilities, augmented reality and special mobile applications, which leads to an increase in the cross-functionality of a specialist and increases the level of competence and professional training (Bresciani et al., 2021).

Digital transformation in the modern economy and human resource management systems is certainly a challenge. Countries that have already reached a high level of digital maturity are now facing complex cultural, organizational and technical problems, and only taking into account all these factors and an integrated approach to solving them made digital transformations successful (Al-Tarawneh, 2021).

There is no doubt that in order for a country to become a real digital leader in specific areas of the economy, it is necessary to identify priority digital projects that are implemented by specific organizational teams with the most relevant and complex digital competencies, as well as to possess significant human potential, both at the level of an individual enterprise and the state as a whole.

International studies show that the human potential in the BRICS countries is at a fairly high level, but not every country uses it to the full and implements all available opportunities to stimulate economic growth (Table 1).

Table 1. Key indicators of human development in the BRICS countries during 2018–2019 (Barricelli, 2020)

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Brazil</th>
<th>Russia</th>
<th>India</th>
<th>China</th>
<th>South Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global competitiveness index / position</td>
<td>4,33/56</td>
<td>4,25/64</td>
<td>4,28/60</td>
<td>4,84/29</td>
<td>4,37 / 53</td>
</tr>
<tr>
<td>Unemployment rate (%)</td>
<td>6,10</td>
<td>5,50</td>
<td>5,30</td>
<td>4,10</td>
<td>25,10</td>
</tr>
<tr>
<td>GDP per capita (at current prices / USD)</td>
<td>11 171</td>
<td>14 604</td>
<td>1,518</td>
<td>6 768</td>
<td>7 810 1</td>
</tr>
<tr>
<td>Share of people employed in the manufacturing industry of the total number of people employed (%)</td>
<td>14</td>
<td>20,2</td>
<td>24,3</td>
<td>30,3</td>
<td>21</td>
</tr>
<tr>
<td>Growth rate of average annual real wages (%)</td>
<td>5,8</td>
<td>5,30 2</td>
<td>-</td>
<td>9</td>
<td>-</td>
</tr>
<tr>
<td>Household spending on education, culture and entertainment (%)</td>
<td>4,10</td>
<td>8,2</td>
<td>-</td>
<td>12,70</td>
<td>6,60</td>
</tr>
<tr>
<td>Internet users per 1,000 inhabitants</td>
<td>492</td>
<td>553</td>
<td>172</td>
<td>458</td>
<td>101</td>
</tr>
<tr>
<td>Illiteracy rate (%)</td>
<td>8,7</td>
<td>0,55</td>
<td>14</td>
<td>3</td>
<td>18</td>
</tr>
</tbody>
</table>
The data in Table 1 shows that China outperforms such countries as Brazil and Russia in terms of real wage growth and ranks 29th in the global competitiveness index. The unemployment rate in the BRICS countries is about 4–6%, with the exception of South Africa, where this figure is about 25%.

Also, based on the data in the table, one can state a large spread of illiteracy rates among the BRICS countries. While Russia has the most favorable indicator (0.55), South Africa and India are characterized by a very high level of illiteracy (18% and 14%, respectively), which indicates the heterogeneity of the BRICS countries, the lack of elementary conditions for the introduction of digital technologies and also points to the challenges in finding skilled workers and ways to retain them faced by companies located in these countries.

4. Discussion

According to a 2020 study by McKinsey in the field of HR management at enterprises of the BRICS countries, only 39% of executives believe that their companies are successfully operating in a digital society, 37% are confident in their ability to reorganize their own human resources and adapt to new realities through the use of analytics and artificial intelligence, and 27% admit that there are difficulties in the transition to the digital environment, since they do not consider HR as a factor of value creation, ignore the possibilities of big data analytics and are generally afraid of using artificial intelligence, therefore, they do not even develop plans for digitalizing human resource management (Ogbeibu, 2021).

Among the total volume of investments in the digitalization of HR processes of the leading companies in the BRICS countries, including international ones, about half of investments (49%) is aimed at the implementation of software solutions for human capital management, a third of investments (32%) covers the use of cloud services, and in the near future, it is planned to increase investments in predictive analytics, improved solutions in the field of process automation and artificial intelligence (Figure 2).

![Figure 2](image-url) 

*Figure 2. Digital products and HR solutions in which it is planned to increase investments of companies in the BRICS countries (Strohmeier, 2020)*
Let us now consider in more detail the features of digital transformations in the human resource management system on the example of some BRICS countries.

**Russia.** The analysis of the situation at Russian enterprises shows that there is a significant gap between those companies that are actively introducing changes, confidently using new digital technologies and breakthrough innovations to improve the human resource management system, and those that have taken a wait-and-see attitude. This situation has led to the fact that only four out of ten HR departments at Russian enterprises operate mainly in digital format. Most HR departments have not yet fully or significantly switched to digital technologies. Less than half of HR professionals (40%) report that in their departments either “almost everything is digital” (7%) or “a lot of things are digital” (33%) (Figure 3).

![Figure 3. The degree of digitalization of human resource management processes at Russian enterprises (%) (Volkova, 2020)](image)

However, it is necessary to note positive aspects in promoting the digital agenda in the personnel management of Russian enterprises. It is obvious that the labor market in the country is developing rapidly, and the set of tools for adapting a company to changes in the digital economy is quite wide. Today, HR managers have a very wide range of different technological solutions, thanks to which they can solve a wide variety of tasks: selection, adaptation, motivation, development, training, personnel communication, remuneration, analytics, and much more.

Representatives of small and medium-sized businesses in Russia turned out to be the most flexible and effective in terms of introducing digital technologies into the strategic circuit of human potential management. Thus, 91% of small and medium-sized business leaders believe that digital HR technologies are important or useful for their business.

According to a study conducted by the Graduate School of Management of St. Petersburg University, 57% of small and medium-sized enterprises currently use digital HR technologies, and another 13% plan to implement them by 2022. Only 17% of small and medium-sized businesses do not set themselves the goal of introducing these tools; more than half of which (51%) have ten or fewer employees (Figure 4).
Table 1. Digital technologies for human capital management widely used in Russia (Yasaman & Mehdi, 2020)

<table>
<thead>
<tr>
<th>Functions</th>
<th>Directions of digitalization</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recruitment</td>
<td>Using social networks, job search sites to collect information, create and publish vacancies</td>
<td>Creation of a database of potential applicants, expanding the possibilities of attracting workers of “new” quality</td>
</tr>
<tr>
<td>Adaptation</td>
<td>Using gamification and a single platform</td>
<td>Accumulation of all information necessary for work, including about the company, work schedule, job responsibilities of employees, the compensation system used, on a single platform</td>
</tr>
<tr>
<td>Motivation</td>
<td>Collecting information about personal characteristics, values and preferences of employees and using it to develop motivational programs</td>
<td>Ensuring a high level of employee motivation through the use of new progressive forms and methods of motivation</td>
</tr>
<tr>
<td>Staff development</td>
<td>Undergoing educational courses through mobile applications, creating an electronic platform for learning</td>
<td>Ensuring the continuity of education; a variety of choice of forms and methods of training at a convenient time, freeing up the resources of the HR department</td>
</tr>
<tr>
<td>Staff evaluation</td>
<td>Conducting electronic testing, providing real-time online assessment</td>
<td>Ensuring transparency and objectivity of the process of assessing the knowledge, skills and abilities of employees</td>
</tr>
<tr>
<td>Control</td>
<td>Using digital tools to collect reports on all processes and tasks in the enterprise</td>
<td>The ability to assess the performance of each employee, providing feedback to the staff</td>
</tr>
</tbody>
</table>

**Figure 4.** The level of use of digital HR technologies by small and medium-sized businesses in Russia (%)

Table 1 provides a description of the main digital technologies that are used in the transformation of the personnel management process in Russia.

**China.** China is the undisputed leader in the implementation of digital technologies in the personnel management field. According to the general model of digital transformation in HR, the country is currently successfully passing the second stage, which involves the development and maximization of employee experience in the digital sphere (Figure 5).

As part of the implementation of the designated model at the enterprises of the country, the concept of smart working has found its widespread use. New technologies and the improvement of existing technologies are a key factor in the development of smart working, which relies on a wide range of tools, such as the Internet, smartphones, social media or any program designed to facilitate work flexibility and mobility.

An analysis of advantages and disadvantages of using smart working for Chinese manufacturers is presented in Table 2.

**Table 2.** Characteristics of the smart working concept (Susanto, 2019)

<table>
<thead>
<tr>
<th>Advantages of using smart working</th>
<th>Disadvantages of using smart working</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State</strong></td>
<td></td>
</tr>
<tr>
<td>1) protection and economical use of limited natural resources;</td>
<td>1) decreases the level of employment among the population;</td>
</tr>
<tr>
<td>2) increases the level of investment attractiveness for obtaining additional international investments;</td>
<td>2) increases cybersecurity threats and risks</td>
</tr>
<tr>
<td>3) increases competitiveness;</td>
<td></td>
</tr>
<tr>
<td>4) additional facilities for people with disabilities and limited mobility</td>
<td></td>
</tr>
<tr>
<td><strong>Enterprise</strong></td>
<td></td>
</tr>
<tr>
<td>1) increased efficiency of work;</td>
<td>1) decrease in productivity due to the fact that remote work is not planned or performed, as well as deterioration in the quality of labor results;</td>
</tr>
<tr>
<td>2) efficient use of limited resources, cost savings;</td>
<td>2) dependence of work efficiency on the quality of communication;</td>
</tr>
<tr>
<td>3) increased productivity due to the flexibility of personnel policy;</td>
<td>3) limitation of live communication and lack of contact of employees with colleagues and partners;</td>
</tr>
<tr>
<td>4) increased time for effective management;</td>
<td>4) reduced system security</td>
</tr>
<tr>
<td>5) increases the level of investment attractiveness to obtain additional capital</td>
<td></td>
</tr>
</tbody>
</table>
Table 2. Continued

<table>
<thead>
<tr>
<th>Advantages of using smart working</th>
<th>Disadvantages of using smart working</th>
</tr>
</thead>
<tbody>
<tr>
<td>staff:</td>
<td></td>
</tr>
<tr>
<td>1) mobility in space and time;</td>
<td>1) lack of contacts and networking</td>
</tr>
<tr>
<td>2) saves time;</td>
<td>for effective business activities;</td>
</tr>
<tr>
<td>3) improves the quality of life;</td>
<td>2) decreased mobility, which negatively</td>
</tr>
<tr>
<td>4) the ability to attract people with disabilities and limited mobility</td>
<td>affects health</td>
</tr>
</tbody>
</table>

Smart working has become very common in recent years in the private and public sectors, which plays a key role in solving the problem of reducing the costs of enterprises. On SmartWork, this movement is supported by new technologies that increase the mobility of work, and the legislation encourages flexibility in employment and new trends in the organization of work in the workplace.

As a result of the use of this concept at Chinese enterprises, the range of areas of human resource management has expanded, in which various digital technologies have found their widest application (Figure 6).

![Wellness system](image)

*Figure 6. Human resource management areas using digital technologies in Chinese companies (%) (Thite, 2019)*

If we consider the dynamics and intensity of the implementation of digital technologies at enterprises in China in the sectoral context, it should be noted that banking/financial services (91%), healthcare (90%) and construction (79%) are in the first place (Figure 7). This is due to the fact that for businesses in these sectors, HR technology is becoming increasingly vital for hiring highly specialized specialists and automating key error-prone tasks, such as time tracking and reporting. For example, medical organizations must check doctors for compliance with the requirements of the State Committee for Health and Planned Childbirth of the People’s Republic of China, financial institutions must comply with the requirements regarding background checks, and construction sites must monitor contractor certificates and ensure the safety of the workplace in accordance with CECS standards.
Brazil. Although significant efforts were made in recent years in some of the country’s industries to digitize and streamline human resource management processes, the digitalization of the human resource management system in Brazil lags far behind Russia and China. There are archaic processes and systems in HR that are often difficult to integrate, which leads to errors, loss of time / costs, and employees’ frustration.

For the most part, efforts are focused on optimizing administrative procedures through the introduction of digital technologies, which is conceptually incorrect in the information economy, since in order to develop new skills and train personnel that will meet global market demands, it is necessary to focus on talent management and the development of new systems of motivation and selection of personnel.

The participants of the study on the level of digitalization of HR management in Brazilian enterprises were asked to identify four main roles that HR plays. The most frequently mentioned role for HR is administrator, which was chosen by 70% of respondents. Half of the participants singled out the role of a compliance officer. However, it should be noted that both roles are transactional rather than strategic in nature. On the other hand, more
than half of the participants (55%) stated that HR personnel acts as a business partner in the enterprise. This assumes a more important role than that of an administrator. However, relatively few people say that HR should be a strategist (30%), a talent management expert (42%), or a planner (25%) (Figure 8).

The roles that HR departments performs in an organization also affect the digital transformation process. Human resources departments focused primarily on administrative functions may be ill-trained or unable to spearhead the change initiatives required to achieve true digital maturity.

**Conclusion**

Summing up the results of the study, the following conclusions can be drawn. The sphere of human resource management is currently under the influence of significant technological challenges and opportunities associated with the processes of globalization and digitalization of the economy and society. Accordingly, the use of advanced technologies and innovations in the practice of enterprises is one of the most important and sustainable trends in global development. The analysis of the features of the digitalization of HR management in the BRICS countries made it possible to establish the heterogeneity of the transition of human resource management systems to the digital format and, as a consequence, the wide variability and heterogeneity of the results obtained.

Enterprises in the BRICS countries have yet to establish close cross-sectoral cooperation to implement the best digital practices (using the Internet of Things, Big Data, cognitive functions (augmented intelligence)) that meet the requirements of the development of the business environment in the global space.

**References**


Determinants of underpricing of initial public offerings (IPOs) of BRICS companies

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Abstract
The purpose of this article is to identify the nature of the influence of crucial factors on the short-term underpricing of initial public offerings of common stocks of companies in the BRICS countries. Based on a sample of 1,141 companies from the BRICS countries that conducted IPOs (using Bloomberg and World Bank databases), we tested the influence of decisive factors on the underpricing of the shares of these companies. The empirical study is based on testing OLS models for different periods: for the period 2001–2018 and separately for the periods 2001–2008 and 2010–2018. The study shows that, firstly, with an increase in the volume of the placement of shares, their underestimation in an IPO decreases. In addition, having an auditor from the Big Four also reduces the underestimation of shares. Secondly, we revealed that the underpricing of shares in the course of an IPO increased with GDP growth. Besides, if companies place their shares on a foreign exchange, the underestimation of their shares increases. At the same time, such IPO parameters as the number of underwriters, the reputation of underwriters, and the deviation of the offer price from the middle of the price range during the placement period do not affect the underestimation of shares for companies from the BRICS countries. Taking into account the results of an empirical study, the article formulates recommendations for improving the efficiency of initial public offerings for companies from the BRICS countries.

Keywords: underpricing of shares during the placement, IPO, common stock, companies from the BRICS countries.

JEL: G30, G35.

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Introduction

The economic development of the BRICS countries has made it necessary for companies to raise additional funding through an initial public offering (IPO). Of course, the primary purpose of issuing common stock is to attract a significant amount of financial resources to finance large projects. At the same time, during the placement of shares, they are often underpriced when the price of offering shares to investors is lower than the closing price on the first day of trading. In 2020, in the United States, the average underpricing of shares during an IPO was 41.6%. The phenomenon of undervaluation is observed not only in countries with developed stock markets, such as the United States, but also in almost all world stock markets. Underestimation by countries ranges from 3% to 240%. In 2020, underestimation of 1,755 IPOs averaged 49.7%. The most important question is which theoretical model best explains this phenomenon of underestimation and which factors significantly impact the underestimation of shares of companies in the BRICS countries? Despite many publications about underestimation, the real reason for this phenomenon is still a matter of controversy. There is no dominant theory that could cause this phenomenon. The article studies the influence of key factors on the short-term underestimation of shares of companies in the BRICS countries in the framework of IPOs.

Firstly, the authors explain the phenomenon of underpricing of stocks and analyze theories that explain the reasons for the underestimation in IPOs. Then we substantiate hypotheses regarding the influence of crucial factors on the underpricing of shares of companies in the BRICS countries. Next, the paper describes companies selected for the research and the results of the empirical study. Finally, we formulate recommendations for improving the efficiency of IPOs for BRICS companies.

1. Analysis of literature and substantiation of the research

1.1. Underpricing of IPOs: Concept and measurement

An initial public offering (IPO) is an initial public sale of a company’s common stock and a listing of shares on a stock exchange. A critical moment in the issue of shares is to determine the price at which the shares will be placed on a stock exchange. Despite the popularity of IPOs for raising funds, there is an anomaly associated with underpricing the issuer’s shares on the first day of trading. Today underpricing is the crucial indicator of the effectiveness of an IPO. The term “underpricing” first appeared in the US academic literature in the 1970s. In modern literature, there are various concepts of this phenomenon. Underpricing of a stock is the difference between its offering price (i.e. the price at which investors buy a stock before they start trading) and the

1 https://www.vedomosti.ru/opinion/articles/2021/03/02/859929-ipo-maniya
2 https://quote.rbc.ru/news/article/603931979a794790aca96263
3 Ibid.
Determinants of underpricing of initial public offerings (IPOs) of BRICS companies

price of the stock at the close of trading on the first day of its listing (Clarin & Neville, 2018). According to Snippert, underestimation of an IPO is the difference between the closing price on the first day of trading and the offering price (Snippert, 2015). In their article, Ibbotson, Sindelar and Ritter define the initial return as the difference between the placement price and the closing price on the first day of trading in the secondary market (Ibbotson et al., 1988). The disadvantage of the above definitions is that we cannot compare the underpricing between different companies since we calculate the indicator in absolute terms. Below we give definitions of underpricing, which we measure as a relative indicator.

Dolvin defines underpricing as a percentage change in the offer price of a common stock relative to the closing price on the first trading day (Dolvin, 2012). A. Napolnov suggests that the closing price of the first trading day significantly affects the success of the IPO. The relative change in price on the first day is called “the first day of trading return” or “initial return.” This return forms the primary return for investors. The effect of high initial profitability is also called the underpricing of the IPO or the “phenomenon of underpricing” (Napolnov, 2010). According to Wen, underpricing is a percentage change in the closing price of the first trading day relative to the bid price (Wen, 2005).

We will use the following definition. Underpricing is a percentage change in the closing price of the first trading day relative to the bid price. The offer (placement) price of a share is the price at which an investor buys the share when the underwriters draw up an order book, i.e. before trading on the stock exchange.

So, underestimation can be measured in the following ways. The first way to measure underestimation is shown in formula (1), where underestimation is measured in absolute terms (Saunders & Lim, 1990; Lee et al., 1996):

\[
IR = P - E,
\]

\(IR\) — initial return; \(P\) — the market closing price of the common stock on the first trading day; \(E\) — offer price of the share.

However, with this calculation, the indicators of underestimation of different companies are not comparable; therefore, it is not suitable for use in our study.

The second way:

\[
UNDP = \ln \frac{FDCP}{OP},
\]

\(UNDP\) — underpricing; \(FDCP\) — the market closing price of the stock on the first trading day (first-day closing price); \(OP\) — offer price of the stock.

This formula makes it possible to compare indicators. The use of the natural logarithm is standard in finance when dealing with interest, including simplifying the interpretation of research results.

The third way:

\[
UNDP = \ln \frac{P}{E} - \ln \frac{M}{M_0},
\]
**UNDP** — underpricing; **P** — the market price of the share at the close of the first trading day on the stock exchange; **E** — offer price of the share; **M** — market index at the close of the first trading day; **M₀** — market index at the time of the placement of the share; **UNDP** — underpricing.

This formula takes into account the impact of market conditions on the dynamics of the stock on the first day of trading. Therefore, we consider Formula 2 to be the most appropriate way to measure the undervaluation of a stock. In well-developed capital markets and in the absence of restrictions on how much stock prices can fluctuate daily, the underpricing becomes evident rather quickly, necessarily by the end of the first day of trading. Therefore, when calculating the underpricing of an IPO, most authors use the closing price of the first day of trading in their studies.

### 1.2. Conclusions of the main theories regarding the reasons for the underpricing of shares in the framework of their initial public offering

The problem of underestimation has existed since the 1960s. Research in this area can be divided into several large theories: information asymmetry theory, institutional theory, ownership and control theory, and behavioral theory.

**Information Asymmetry Theories**

**Rock model (Winner’s curse / Rock’s model).** Kevin Rock in his article suggests that underpricing arises from the presence of two groups of investors on the market: investors possessing insider information about the company and its valuation, and investors who do not have high-quality and complete information about the fair price of shares (Rock, 1986). The resulting information asymmetry disturbs the equilibrium when buying shares. Informed investors buy shares of companies with stable financial performance and development vectors, while uninformed investors are forced to invest in a company based solely on their forecasts and expectations. As a result, uninformed investors risk buying up a large number of overvalued shares, which could lead to their exit from the market due to low investment returns. With a fair valuation of shares by the issuer, the demand for them will be significantly lower due to the withdrawal of some investors from the market. To eliminate the superiority of informed investors and create the image of a profitable company, the issuer deliberately underestimates its stake (Azhikhanov, 2011).

**Ex-ante uncertainty.** Beatty and Ritter used Rock’s model (Rock, 1986) and suggested that the underpricing was related to the expected uncertainty about the value of the listed company (Beatty & Ritter, 1986). Since the future performance is subject to uncertainty, investors need to extract information about their future investments. The issuer, in turn, does not aim to disclose complete information concerning the issue, which increases the costs of investors to obtain information about the company. Thus, Beatty and Ritter suggested that underpricing compensated investors for the cost of obtaining information.
due to uncertainty. It should be noted that this hypothesis has found empirical confirmation in many publications.

_Hypothetical Wealth Losses & Certification_. Habib and Ljungqvist introduce an addition to the Rock model (Rock, 1986). In the Rock model, the issuer deals with the problem of underpricing and adverse selection. The issuer reduces information asymmetry due to additional disclosure costs, thereby reducing company’s losses and underpricing. However, the benefit of reducing the underpricing may not offset the cost of producing information. Therefore, issuers will reduce information asymmetry as long as the marginal cost of reducing underpricing equals the marginal benefit (Habib & Ljungqvist, 2001). The obvious way to reduce information asymmetry is to hire a prestigious underwriter, a reputable auditor. The underwriter’s brand is also used as a “certificate” for the reputational capital of the bank (Booth & Smith, 1986).

_Book building theory_. The theory was first put forward in an article by Benveniste and Spindt (1989). An order book allows underwriting banks to define the price range more accurately and place the price at the top of the range. To establish a fair share price, underwriters need to obtain information from institutional investors who have more in-depth knowledge of the company’s value. However, it is not profitable for institutional investors to disclose such valuable information. Instead, they provide information on the fair value of shares if they receive a large share of the undervalued shares in return (Benveniste & Spindt, 1989). It should be noted that the effect of the book-building mechanism on the underpricing of shares in the framework of an IPO is almost impossible to directly investigate due to the confidentiality of the data.

_The principal-agent model_ assumes an asymmetry of information between the issuer (principal) and the underwriter (agent) when the underwriter bank has much more complete information about the fair price of a company’s share (Baron, 1982). The way to test this hypothesis is to study IPOs characterized by low information asymmetry or its absence. This occurs if the underwriters own a stake in the issuer or when investment banks undertake IPOs. For example, Muscarella and Vetsuypens studied 38 IPOs of investment banks in which the issuers (investment banks) acted as underwriters. Since the underwriter and the issuer are one person, there should be no agency problem (Muscarella & Vetsuypens, 1989). However, the underestimation was at about the same level as IPOs, which gives the authors a reason to interpret the results as contradicting the principal-agent model.

A large share of stock makes it possible to participate in pricing. In his article, Reuter correlated the volume of shares allocated to institutional investors with their stakes in these companies after the issue. He found a positive relationship between the commissions paid to the top underwriter and the fund’s equity post-IPO. The fact is that funds buy undervalued IPOs, paying high commissions to underwriters. Mutual funds are among the institutional investors in this study. The underwriters and the fund are “in collusion;” the underwriter deliberately underestimates the IPO, distributes

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4 Book building — drawing up an order book to study the demand for shares from potential investors and form the price of shares.
a share to the fund, and receives a commission from the fund’s purchase of shares. According to the authors’ assessment, underwriters receive 85% of their commissions from underestimated profits (Reuter, 2006). Based on this theory, we can conclude that the information asymmetry between the issuer and the underwriter negatively affects underpricing.

**Signaling theory.** The main contribution to this theory was made by Allen and Faulhaber and some other authors (Allen & Faulhaber, 1989; Grinblatt & Hwang, 1989; Welch, 1989). According to the theory, there are two types of companies in the market that cannot distinguish between investors: high quality and low quality. High-quality companies signal their high quality to raise capital on favorable terms. Low-quality companies can only imitate what makes them high quality in the market. The signal is the price of the stock. High-quality companies with good performance tend to sell at below-market prices to differentiate themselves from low-quality companies. Since low-quality companies do not have the opportunity to underestimate the valuation, this method is beneficial for high-quality issuers who expect compensation for damage from the discount during the subsequent placement. Grossly underestimated IPOs receive comprehensive media coverage, which is beneficial for both investors and the issuer. The opportunity to conduct such a successful deal will attract investors for future IPOs.

**Institutional theories**

**Lawsuit avoidance.** The issuer and the underwriter wish to avoid legal liability under US federal securities laws for inaccurate information in a prospectus. According to the Securities Act of 1933, the amount of damage increases by the difference between the offer price and the lower market price after trading on the stock exchange. According to this hypothesis, the greater the difference between the offering price and the subsequent market price, the less likely a lawsuit is, and the less likely an unfavorable court decision is in case of a lawsuit from investors. However, actual damage in the US is limited to the bid price. Lowry and Shu estimated that 5.8% of US-based companies were subject to legal liability (Lowry & Shu, 2002, 315), and the average litigation loss was 13% of the proceeds from the placement (Lowry & Shu, 2002, 317). Thus, underpricing reduces the likelihood of subsequent damage. The likelihood of litigation during an IPO in the BRICS countries is very low due to the poorly developed judicial system. Therefore, this theory is not suitable for explaining the reason for the underpricing in the BRICS countries.

**Price stabilization.** In an initial public offering, the underwriter has the right to use legal tools to maintain the share price at the desired level. A common practice is the price stabilization mechanism — the underwriter supports the market price of shares after the IPO. To maintain price control, the underwriter will take a short position on 10–20% of placement issues. This strategy allows to stabilize prices by increasing or decreasing supply. Depending on price fluctuations, the bank makes decisions using the green shoe option. The theoretical concept of price stabilization was initially developed by Booth and Smith (1986), formalized by Benveniste, Busaba and Wilhelm (Benveniste et al., 1996) and proved its statistical validity in the US market in empirical articles by Ruud (Ruud,
Determinants of underpricing of initial public offerings (IPOs) of BRICS companies

1993) and Ellis, Michaely and O’Hara (Ellis et al., 2000). Successful price intervention truncates the lower range of the stock price distribution, thereby mechanically creating a positive average underestimation.

**Tax benefit.** Underestimation can be beneficial from a tax point of view. A hypothesis is put forward in the work by Taranto. The US tax system provides incentives for managers to undervalue shares in an IPO. Managers and employees who hold stock options pay tax in two stages. First, when exercising any option, they pay income tax on the income from the difference between the strike price of the share option and the market price. Second, on the subsequent sale of the underlying shares that it acquired due to the exercise of the option, capital gains between the fair market price and the selling price are taxed (Taranto, 2003). US tax law considers the fair market value of options exercised in connection with an IPO to be the offer price, and not the price that will prevail in the market after the start of trading (Yuan, 2009). Thus, it creates an incentive for underestimation. The tax system of the BRICS countries does not provide an incentive for underestimating IPOs, so this theory cannot be used to explain the reason for underestimation in these countries.

**Ownership and control theories**

**Managerial control.** Brennan and Franks suggest that undervaluation is a way to preserve the personal gain of management through strategic share allocations when going public (Brennan & Franks, 1997). Managers are reluctant to hand over large blocks of shares to institutional investors who can test the quality of management and its drive to maximize company value. A small fraction of an institutional investor’s shares reduces external control. First, due to the strong dispersion of stocks among investors, monitoring becomes a public good, and investors will invest in a low level of monitoring (Shleifer & Vishny, 1986). Secondly, many investors with small stakes reduce the likelihood of a hostile takeover and displacement of the current management. The role of underpricing in this hypothesis is to create excessive demand for stocks, making it possible to reduce each investor’s share. In the BRICS countries, most large companies are controlled by the state or by a single private owner; therefore, the possibility of transferring a large stake to an institutional investor and the likelihood of a takeover are excluded. Also, the management does not have strong incentives to underprice since they will in any case be controlled by the main shareholder in the person of the state or an investor with a large stake.

**Agency costs.** The behavior of managers seeking to maintain control of the company may change after the IPO due to agency costs. Agency costs between managers and shareholders arise from insufficient funds raised in the IPO process and a further decline in stock prices. Managers who own shares of the company bear these costs to the same extent as other owners. If agency costs may ultimately exceed the benefits of protecting private interests, then it becomes more profitable for managers to reduce their control over the company. Stoughton and Zechner argue that the transfer of a significant shareholding to a large investor increases the company’s value due to the fact that the investor receives external control over management (Stoughton & Zechner, 1998). If the ownership of the
company is scattered, then monitoring will be weak. It is not profitable for small investors to invest in monitoring since all shareholders will benefit from it. To improve monitoring, managers can allocate a large block of shares to one of the investors. However, from an investor’s point of view, it can be risky to invest in a large shareholding. As an additional incentive, undervalued shares are offered to investors.

**Behavioral theories**

*The theory of informational cascades.* According to Welch, uninformed investors copy the behavior of knowledgeable investors (Welch, 1992). The increase in the bid price is interpreted as positive information previously received by investors about the quality of the shares. Even when they receive a signal about a possible revaluation, uninformed investors ignore it and apply to buy shares. In this case, successful initial sales encourage investors who buy shares later to invest in shares, regardless of whether they have their own information. With low initial sales, investors who buy shares after the placement may opt-out of the purchase. Thus, the demand for stocks is either growing or remains low. Such information cascades are due to the lack of free communication among investors. The absence of a free information flow is an advantage for the issuer, since the probability of widespread dissemination of negative information is reduced. In addition, information cascades give the earliest investors bargaining power, which may demand more undervaluation in exchange for early bids, stimulating demand.

*Sentimental investors.* In addition to irrational investors, sentimental investors also influence the stock price. Since most of the companies listed on the stock exchange are relatively young and non-transparent, it is pretty difficult to assess them and their impact on investors, and the market is also unpredictable. Ljungqvist, Nanda and Singh suggest that some investors are optimistic about the company’s future (Ljungqvist et al., 2004). Therefore, the issuer tries to maximize the excess of the valuation over the share’s internal (fair) value. Overflowing the market with stocks cause the price to decline, so the issuer holds the stock to adjust the price. As a result, the market will bring the share price to fair value. However, regulatory restrictions prevent the issuer from using this strategy directly. The best option in this case is to distribute shares among institutional investors, who will then resell them to optimistic investors at prices prevailing in the market due to supply constraints. Such speculation can be risky for institutional investors due to unpredictable demand from optimistic investors, as demand may end prematurely. Therefore, they demand a discount in the form of undervaluation. Moreover, even undervalued shares benefit the issuer in this configuration.

The main conclusions of the considered theoretical concepts are presented in Table 1. It can be concluded that the most appropriate theories explaining the reasons for underestimation for the BRICS countries are the theories of information asymmetry and some conclusions of the institutional theory. Ownership and control theories, as well as behavioral theories, target more developed markets, such as the US and the UK.
### Table 1. Theoretical models explaining the phenomenon of underpricing

<table>
<thead>
<tr>
<th>Theories</th>
<th>Scientific article</th>
<th>Conclusions of the theory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Information asymmetry theories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Rock model</em></td>
<td>Rock, 1986</td>
<td>Underestimation arises due to the presence of two groups of investors on the market: informed and uninformed</td>
</tr>
<tr>
<td><em>Ex-ante uncertainty</em></td>
<td>Beatty &amp; Ritter, 1986</td>
<td>Investors need to underestimate stocks to offset the expected uncertainty</td>
</tr>
<tr>
<td><em>Entrepreneurial wealth losses &amp; certification</em></td>
<td>Habib &amp; Ljungqvist, 2001; Booth &amp; Smith, 1986</td>
<td>The issuer reduces information asymmetry due to additional costs of information production, thereby reducing the company’s losses and underpricing</td>
</tr>
<tr>
<td><em>Book building theory</em></td>
<td>Benveniste &amp; Spindt, 1989</td>
<td>In the book-building process, institutional investors provide information to the underwriter about the demand, expecting an underestimated share of the company’s shares in the future</td>
</tr>
<tr>
<td><em>The principal-agent model</em></td>
<td>Baron, 1982</td>
<td>Information asymmetry exists between the issuer (principal) and the underwriter (agent)</td>
</tr>
<tr>
<td><em>Signaling theory</em></td>
<td>Allen &amp; Faulhaber, 1989; Grinblatt &amp; Hwang, 1989; Welch, 1989</td>
<td>High-quality companies with good performance seek to sell below market shares to differentiate themselves from the low-quality group of companies</td>
</tr>
<tr>
<td><strong>Institutional theories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Lawsuit avoidance</em></td>
<td>Lowry &amp; Shu, 2002</td>
<td>Underestimation arises from the desire of the issuer to avoid legal proceedings with investors after the placement</td>
</tr>
<tr>
<td><em>Price stabilization</em></td>
<td>Ruud, 1993; Ellis, Michaely &amp; O’Hara, 2000</td>
<td>Successful price intervention truncates the bottom of the stock price distribution, thereby mechanically creating a positive average undervaluation</td>
</tr>
<tr>
<td><em>Tax benefit</em></td>
<td>Rydqvist, 1997</td>
<td>Underestimation is used as a way to optimize taxes</td>
</tr>
<tr>
<td><strong>Ownership and control theories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Managerial control</em></td>
<td>Brennan &amp; Franks, 1997</td>
<td>Underestimation is a way to preserve the personal benefits of management through strategic share allocation</td>
</tr>
<tr>
<td><em>Agency costs</em></td>
<td>Stoughton &amp; Zechner, 1998</td>
<td>Underpricing is an incentive for a prominent investor, whom the issuer wants to attract to improve monitoring</td>
</tr>
<tr>
<td><strong>Behavioral theories</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>The theory of Informational cascades</em></td>
<td>Welch, 1992</td>
<td>Underpricing occurs when ignorant investors copy the behavior of knowledgeable investors</td>
</tr>
<tr>
<td><em>Sentimental investors</em></td>
<td>Ljungqvist et al., 2004</td>
<td>Underpricing is a risk compensation for institutional investors speculating in the interests of the issuer</td>
</tr>
</tbody>
</table>
1.3. **Substantiation of hypotheses about the influence of factors on the underpricing of IPOs of companies in the BRICS countries**

Having considered theoretical concepts and empirical models, let us formulate hypotheses regarding the influence of factors on the underestimation of IPOs.

**Hypothesis 1**: Uncertainty about the future value of the company has a positive effect on underestimation. This hypothesis is put forward in the work of Beatty and Ritter and is consistent with the theory of expected uncertainty. The authors suggest that the greater the expected uncertainty, the greater the underestimation (Beatty & Ritter, 1986). This hypothesis was empirically confirmed in the course of research. Various proxies are used for verification. In our study, placement volume is used as a determinant (Beatty & Ritter, 1986). Larger volumes are offered by stable companies, while smaller volumes are issued by at-risk companies, which increases the uncertainty about their future value. Therefore, the level of underpricing of stable companies is lower than that of small ones. It is also easier for investors to get information about large companies faster than about small ones, which reduces their costs, and, therefore, they require less underestimation.

**Hypothesis 2**: Placing stocks above the middle of the price range has a positive effect on underestimation. This hypothesis is consistent with the book building theory. Institutional investors disclose information while filling the order book, which allows underwriters to determine the range of the offering more accurately. Investors provide such a service to the underwriting bank in order to underprice a larger block of shares. Therefore, an IPO with positive information from investors should be placed at the top of the price range. Using this information, the underwriter partially adjusts the share price as a reward to the investors who provided the information. Thus, the placement occurs at the top of the price range. We use the deviation of the bid price from the middle of the price range to measure this determinant (Ibbotson et al., 1988).

**Hypothesis 3**: The prestige of underwriters and auditors negatively impacts underestimation. This hypothesis is consistent with the theory of entrepreneurial losses and certification. A hypothesis is suggested by Booth and Smith, and Habib and Ljungqvist (Booth & Smith, 1986; Habib & Ljungqvist, 2001). The authors argue that the issuer uses the underwriter’s brand as evidence of a fair valuation of the company. The updated Carter and Manaster rating (Carter & Manaster, 1990) can be used as a rating. Auditors also play an essential role in the IPO process. Enron’s history of manipulation of financial statements and the collapse of one of the largest audit firms in the world, Arthur Anderson, has diminished confidence in the financial market. Therefore, the reliability of reporting is an essential criterion for investors. Lees and Wahal argue that a prestigious auditor is an additional signal of stock quality (Lees & Wahal, 2004).

**Hypothesis 4**: Information asymmetry between the issuer and the underwriter has a positive effect on underestimation. This hypothesis is consistent with the principal-agent theory. The underwriter is a key player in the IPO process. The principal-agent problem arises between the issuer and the underwriter. Top underwriters have more professional information about the value of companies and the state of the market. Only the underwriter bank can fairly evaluate the company. In this connection, the underwriter has additional
incentives to conceal this information. For example, if a bank participates in a deal and buys back shares for further sale on the secondary market, it would be natural to underestimate the company and increase its margin. To test the hypothesis, one can use the number of underwriters (Korsten, 2018) participating in the company’s IPO process. Several underwriter banks accompany most modern IPOs, and, therefore, the more of them, the stronger the information asymmetry between the issuer and the underwriters.

**Hypothesis 5:** The placement of shares on a foreign market negatively affects undervaluation. This hypothesis is consistent with the signaling theory. Issuers try to make their issue the most attractive for investors. Therefore, the placement of shares on a prestigious foreign stock exchange will be a positive signal for investors. In addition, compliance with strict requirements of listing on a popular exchange indicates the high quality of its shares and increases interest in them.

**Hypothesis 6:** GDP growth rate has a positive effect on underestimation. The BRICS share in global GDP gradually increased between 2001 and 2018. The prospects for such growth certainly stimulated the investment opportunities of the countries. As a result, IPO activity increased dramatically from 2000 to 2010. In 2010, the share of BRICS in the total IPO volume was 60%. Most of the growth in emerging capital markets is related to economic growth. Therefore, it is advisable to include in the model an indicator of the state of the economy of each of the countries in certain periods. Hence, the GDP growth rate is used as a determinant of economic growth.

2. **Research model**

Most modern studies identify the reasons for IPO underpricing on the example of developed markets, such as the United States and the United Kingdom. The markets of specific countries and individual stock exchanges are also studied. Generally, multiple linear regressions (MLR) are used, based on the influence of various factors on the dependent variable — the IPO underpricing. Researchers also use Logit and Probit models of the probability of IPO underpricing.

In the study (Xu & Zhao, 2014), the authors determine the factors of IPO underpricing of Chinese companies using an MLR model. The dependent variable is the IPO underpricing, and the influencing factors are various parameters of companies, exchanges, and IPO. The authors also use a Probit model with the same influencing factors on the probability of IPO underpricing. The sample includes 2,031 IPOs of Chinese companies on the Shanghai and Shenzhen stock exchanges from 1990 to 2010. The model evaluates the influence of the parameters of companies, exchanges, and IPOs on the underpricing of the Chinese IPOs and identifies differences in the levels of underpricing of state and private companies. The authors determine that the factors of Chinese IPOs underpricing are information asymmetry, the state’s share in the company, and risk.

Azhikhanov (2011) focuses on the London Stock Exchange IPOs from 1996 to 2008 and identifies the factors influencing the IPO underpricing on this stock exchange. The author uses an MLR model. The total sample of 906 companies is divided into
several groups depending on factors. Further, the author divides the companies into two subgroups: 774 local and 132 foreign. The advantage of this model is the identification of differences in significant factors of IPO underpricing of local and foreign companies. The volume of foreign companies’ IPOs increases the underpricing more than that of local ones. At the same time, the underwriter’s reputation reduces the IPO underpricing in foreign companies more than in local ones.

Korsten (2018) identifies the IPO underpricing factors on European stock exchanges from 2010 to 2017. The variables of interest for research are high-tech companies, IPO volume, underwriters’ rating and their number. The model also considers the fixed effects of the country and the year of the IPO. The author states that the reputation and the number of underwriters influence the level of IPO underpricing.


It is worth noting that the advantage of the multiple linear regression, in contrast to the Logit and Probit model, is the ability to quantify the influence of a factor, and not just the probability of IPO underpricing.

The dependent variable in our study is the IPO underpricing (UNDP). It is calculated as the natural logarithm of the ratio of the first-day closing price to the offer price. We have developed a multiple linear regression to study the influence of factors on the IPO underpricing of the BRICS countries.

\[ UNDP = \alpha + \beta_1 \ln(\text{Size}) + \beta_2 \text{RangeDev} + \beta_3 \text{Number} + \beta_4 \text{Reputation} + \]
\[ + \beta_5 \text{Big4} + \beta_6 \text{Foreign} + \beta_7 \text{GDPgrowth} + \text{Years} + \text{Country} + \varepsilon. \]

3. Description of the selection of companies for the research

IPO data and macroeconomic data were sourced from Bloomberg and the World Bank databases. For the study, we compiled a sample of IPOs of BRICS companies. First, we formed IPOs from 2001 to 2018 (5,257 IPOs). Second, we excluded 511 IPOs of financial sector companies whose characteristics and pricing are different from other sectors. Finally, we excluded from the sample IPOs for which there were no data. The final sample included 1,141 IPOs (Table 2).

<table>
<thead>
<tr>
<th>Table 2. Sample selection criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPOs of BRICS companies from 2001 to 2018</td>
</tr>
<tr>
<td>Financial sector IPOs</td>
</tr>
<tr>
<td>Missing data</td>
</tr>
<tr>
<td><strong>Final sample</strong></td>
</tr>
</tbody>
</table>

Source: compiled by the authors based on the Bloomberg database.
The distribution of the final sample by year and the average underpricing for a given year is shown in Figure 1. We note a high level of average IPO underpricing in 2001–2002. A possible explanation for this could be the recovery from the dot-com bubble and the low number of IPOs in these years. From 2004 to 2009, there was both an increase in the total number of IPOs and an average underpricing. From 2010 to 2018, the underpricing is stable and ranges from 5% to 25%. In addition, there is no longer such a pronounced positive relationship between the indicators as in 2004–2009.

Source: compiled by the authors based on the Bloomberg database.

**Figure 1.** Total number of IPOs and average underpricing

Figure 2 shows the distribution of IPOs by country. Most of the listed companies are Chinese, and a third of the IPOs in the sample are Indian. Russia, Brazil, and South Africa account for less than 10% of IPOs.

Source: compiled by the authors based on the Bloomberg database.

**Figure 2.** Number of IPOs by country

Most companies belong to sectors such as industry, consumer goods and telecommunications (Figure 3).
Descriptive statistics of the main variables used in the study are presented in Table 3. It should be noted that there is a significant difference between the average IPO underpricing and its median value. The average IPO underpricing is 26.32%, while the median IPO underpricing is 6.92%. On average, companies raise about $267 million in IPOs. The deviation of the offer price from the middle of the price range is on average –0.34%. The number of underwriters ranges from 1 to 23, with an average of 2.24 underwriters per IPO. 34% of companies hire reputable underwriters for IPOs. Nearly half of companies employ prestigious accounting firms of the “Big Four.” 13% of companies practice listing on foreign stock exchanges. The average GDP growth rate for 2001–2018 in the BRICS countries is 7.84%.

Table 3. Descriptive statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDP (%)</td>
<td>26.32</td>
<td>6.92</td>
<td>65.31</td>
<td>–84.38</td>
<td>926.60</td>
</tr>
<tr>
<td>Size ($m)</td>
<td>266.90</td>
<td>75.15</td>
<td>952.1</td>
<td>0.60</td>
<td>25032.00</td>
</tr>
<tr>
<td>RangeDev (%)</td>
<td>–0.34</td>
<td>0.75</td>
<td>11.57</td>
<td>–48.41</td>
<td>150.00</td>
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<tr>
<td>Number</td>
<td>2.24</td>
<td>2.00</td>
<td>1.99</td>
<td>1.00</td>
<td>23.00</td>
</tr>
<tr>
<td>Reputation</td>
<td>0.34</td>
<td>0.00</td>
<td>0.47</td>
<td>0.00</td>
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</tr>
<tr>
<td>BIG4</td>
<td>0.49</td>
<td>0.00</td>
<td>0.50</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Exchange</td>
<td>0.13</td>
<td>0.00</td>
<td>0.34</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>GDP growth (%)</td>
<td>7.84</td>
<td>7.77</td>
<td>2.23</td>
<td>–1.97</td>
<td>14.23</td>
</tr>
</tbody>
</table>

Source: compiled by the authors based on the Bloomberg database.

Analysis of the scatter plot of the IPO volume and underpricing shows some patterns (Figure 4). As the volume of IPO increases, the underpricing decreases on the first trading
The level of IPO underpricing with small volume (up to $500 million) is significantly higher compared to larger IPOs. At the same time, the probability of IPO overpricing increases, i.e. negative dynamics on the first trading day.

Source: compiled by the authors based on the Bloomberg database.

Figure 4. The scatter plot of IPO volume and underpricing

Initial analysis of the correlation matrix (Figure 5) shows some interrelationships between the variables. The UNDP_Perc is expressed as a percentage.

Source: calculated by the authors based on the Gretl program.

Figure 5. Matrix of paired correlation coefficients
4. Research findings

4.1. Results and their interpretation

First, we built a model using the OLS method for the entire sample of companies for the period from 2001 to 2018. The results are shown in Table 4. Model 1 included only quantitative variables without dummies and the GDP growth rate. Only the variable number of underwriters was significant at the 1% level. Next, we added binary variables and the GDP growth rate to the model (Model 2). The variable number of underwriters lost its significance. The variables underwriter’s reputation, prestigious auditor and the GDP growth rate are significant at the 1% level, and the variable foreign stock exchange is significant at the 10% level. In Model 3, we added fixed annual effects. It is worth noting an increase in the adjusted $R^2$ of more than 10%. Model 4, in addition to annual effects, also considers fixed country effects. The variable IPO volume has become significant, even though it was not significant in previous models. The variable reputation of the underwriter has lost its significance. The variables prestigious auditor, foreign stock exchange and GDP growth rate retained their significance in Model 4. The variables deviation of the offer price from the middle of the price range and the number of underwriters are not significant.

Table 4. OLS regressions for 2001–2018

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>const</td>
<td>0.250***</td>
<td>-0.025</td>
<td>-0.140***</td>
<td>0.150***</td>
</tr>
<tr>
<td>(0.029)</td>
<td>(0.041)</td>
<td>(0.039)</td>
<td>(0.056)</td>
<td></td>
</tr>
<tr>
<td>InSize</td>
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<td>0.001</td>
<td>-0.010</td>
<td>-0.023***</td>
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<tr>
<td>(0.006)</td>
<td>(0.008)</td>
<td>(0.009)</td>
<td>(0.009)</td>
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</tr>
<tr>
<td>RangeDev</td>
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<td>-0.001</td>
<td>0.001</td>
<td>0.002</td>
</tr>
<tr>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
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<tr>
<td>Number</td>
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<td>-0.006</td>
<td>0.004</td>
<td>0.007</td>
</tr>
<tr>
<td>(0.005)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td>(0.004)</td>
<td></td>
</tr>
<tr>
<td>Reputation</td>
<td>-0.083***</td>
<td>-0.063***</td>
<td>-0.039</td>
<td></td>
</tr>
<tr>
<td>(0.022)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIG4</td>
<td>-0.117***</td>
<td>-0.084***</td>
<td>-0.159***</td>
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</tr>
<tr>
<td>(0.021)</td>
<td>(0.020)</td>
<td>(0.027)</td>
<td></td>
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</tr>
<tr>
<td>Foreign</td>
<td>0.065*</td>
<td>0.093***</td>
<td>0.064**</td>
<td></td>
</tr>
<tr>
<td>(0.033)</td>
<td>(0.033)</td>
<td>(0.032)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP growth</td>
<td>0.035***</td>
<td>0.038***</td>
<td>0.022***</td>
<td></td>
</tr>
<tr>
<td>(0.004)</td>
<td>(0.005)</td>
<td>(0.008)</td>
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</tr>
<tr>
<td>Years</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Country</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>1.141</td>
<td>1.141</td>
<td>1.141</td>
<td>1.141</td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.029</td>
<td>0.103</td>
<td>0.214</td>
<td>0.242</td>
</tr>
</tbody>
</table>

Note: the value of the standard error is indicated in parentheses below the coefficient values, ***$p < 0.01$; **$p < 0.05$; *$p < 0.1$.

Source: compiled by the authors.
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
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<th></th>
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<tbody>
<tr>
<td><strong>const</strong></td>
<td>0.549***</td>
<td>0.137***</td>
<td>0.069</td>
<td>0.014</td>
<td>0.150*</td>
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<td>0.108</td>
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<td></td>
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<td>(0.079)</td>
<td>(0.050)</td>
<td>(0.088)</td>
<td>(0.051)</td>
<td>(0.016)</td>
<td>(0.067)</td>
</tr>
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<td>lnSize</td>
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<td>−0.003</td>
<td>−0.009</td>
<td>−0.001</td>
<td>−0.036*</td>
<td>0.002</td>
<td>−0.043*</td>
<td>−0.010</td>
</tr>
<tr>
<td></td>
<td>(0.014)</td>
<td>(0.006)</td>
<td>(0.020)</td>
<td>(0.006)</td>
<td>(0.021)</td>
<td>(0.008)</td>
<td>(0.022)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>RangeDev</td>
<td>−0.005**</td>
<td>0.003**</td>
<td>−0.005***</td>
<td>0.003*</td>
<td>−0.003*</td>
<td>0.003*</td>
<td>−0.002</td>
<td>0.003**</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
<td>(0.002)</td>
</tr>
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<td>−0.008</td>
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<td>0.025</td>
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<td>(0.019)</td>
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<td>(0.021)</td>
<td>(0.005)</td>
<td>(0.023)</td>
<td>(0.004)</td>
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<td>−0.063***</td>
<td>−0.070</td>
<td>−0.057***</td>
<td>−0.067</td>
<td>−0.032</td>
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<tr>
<td></td>
<td>(0.049)</td>
<td>(0.021)</td>
<td>(0.052)</td>
<td>(0.021)</td>
<td>(0.052)</td>
<td>(0.023)</td>
<td></td>
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</tr>
<tr>
<td>BIG4</td>
<td>−0.185***</td>
<td>−0.032</td>
<td>−0.151***</td>
<td>−0.046**</td>
<td>−0.219***</td>
<td>−0.110***</td>
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<tr>
<td></td>
<td>(0.045)</td>
<td>(0.023)</td>
<td>(0.045)</td>
<td>(0.022)</td>
<td>(0.050)</td>
<td>(0.035)</td>
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<tr>
<td>Foreign</td>
<td>−0.038</td>
<td>0.123***</td>
<td>−0.007</td>
<td>0.125***</td>
<td>0.061</td>
<td>0.084**</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.087)</td>
<td>(0.033)</td>
<td>(0.082)</td>
<td>(0.032)</td>
<td>(0.086)</td>
<td>(0.033)</td>
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<tr>
<td>GDPGrowth</td>
<td>0.046***</td>
<td>0.015***</td>
<td>0.054***</td>
<td>0.020***</td>
<td>0.037*</td>
<td>0.014</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.005)</td>
<td>(0.007)</td>
<td>(0.006)</td>
<td>(0.022)</td>
<td>(0.018)</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<td>693</td>
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<tr>
<td>Adj. R²</td>
<td>0.076</td>
<td>0.024</td>
<td>0.201</td>
<td>0.049</td>
<td>0.275</td>
<td>0.080</td>
<td>0.293</td>
<td>0.103</td>
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*Note:* The value of the standard error is indicated in parentheses below the coefficient values, ***p < 0.01; **p < 0.05; *p < 0.1.

*Source:* compiled by the authors.
Second, we divided the sample into two periods: 2001–2008 and 2010–2018. It should be noted that we excluded 2009 due to the outbreak of the global financial crisis at that time and a sharp decline in the number of IPOs, which may distort the estimate. The division into periods reveals potential differences in the factors of IPO underpricing before and after the global financial crisis. The results are presented in Table 5. All variables are significant in Model 1 for both intervals, except for the variable IPO volume for 2010–2018. However, in Model 2, the variable IPO volume lost significance in both periods, as did the variable number of underwriters. In addition, in Model 2, the variables underwriter reputation and GDP growth rate are significant at the 1% level in both periods. In Model 3, which considers fixed annual effects, the variable deviation of the offer price from the middle of the price range remains significant, as in the previous models. The variable reputation of the underwriter loses its significance in the period 2001–2008 but remains significant for the second period. The variable prestigious auditor is significant in both periods. The final Model 4 includes fixed annual and country effects. The variable deviation of the offer price from the middle of the price range loses its significance in 2001–2008. However, it is significant at the 5% level in 2010–2018. The variable prestigious auditor is significant at the 1% level in both periods. The variable IPO volume and the rate of GDP growth are significant at the 10% level in the period 2001–2008, as well as the variable foreign stock exchange is significant for the period 2010–2018.

Table 6 presents the model results for each of the countries. It is rather hard to focus on the model coefficients for Brazil and Russia since the sample of companies from these countries is small. The variables deviation of the offer price from the middle of the price range and the reputation of the underwriter are significant for Indian companies. The variables IPO volume, prestigious auditor and GDP growth rate are significant for companies from China.

**Table 6. OLS regressions for each of the BRIC countries**

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Russia</th>
<th>India</th>
<th>China</th>
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</thead>
<tbody>
<tr>
<td>const</td>
<td>43.677***</td>
<td>0.865</td>
<td>−0.539*</td>
<td>−6.676***</td>
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<tr>
<td></td>
<td>(12.150)</td>
<td>(0.570)</td>
<td>(0.296)</td>
<td>(2.057)</td>
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<tr>
<td>lnSize</td>
<td>0.011</td>
<td>−0.099</td>
<td>0.006</td>
<td>−0.049***</td>
</tr>
<tr>
<td></td>
<td>(0.032)</td>
<td>(0.101)</td>
<td>(0.012)</td>
<td>(0.011)</td>
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<tr>
<td>RangeDev</td>
<td>0.002</td>
<td>0.004</td>
<td>0.007**</td>
<td>0.001</td>
</tr>
<tr>
<td></td>
<td>(0.002)</td>
<td>(0.005)</td>
<td>(0.003)</td>
<td>(0.001)</td>
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<tr>
<td>Number</td>
<td>−0.015</td>
<td>0.027</td>
<td>0.015</td>
<td>0.002</td>
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<tr>
<td></td>
<td>(0.010)</td>
<td>(0.041)</td>
<td>(0.016)</td>
<td>(0.005)</td>
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<tr>
<td>Reputation</td>
<td>−0.048</td>
<td>0.231</td>
<td>−0.115***</td>
<td>0.038</td>
</tr>
<tr>
<td></td>
<td>(0.029)</td>
<td>(0.270)</td>
<td>(0.038)</td>
<td>(0.028)</td>
</tr>
<tr>
<td>BIG4</td>
<td>0.027</td>
<td>0.081</td>
<td>0.043</td>
<td>−0.250***</td>
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<tr>
<td></td>
<td>(0.075)</td>
<td>(0.099)</td>
<td>(0.040)</td>
<td>(0.038)</td>
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</table>
Table 6. Continued

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Russia</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign</td>
<td>-0.018</td>
<td>-0.024</td>
<td>0.165</td>
<td>0.021</td>
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<tr>
<td></td>
<td>(0.036)</td>
<td>(0.123)</td>
<td>(0.138)</td>
<td>(0.042)</td>
</tr>
<tr>
<td>GDPGrowth</td>
<td>-32.891***</td>
<td>-0.228</td>
<td>0.025</td>
<td>1.015***</td>
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<td></td>
<td>(9.194)</td>
<td>(0.218)</td>
<td>(0.040)</td>
<td>(0.307)</td>
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<td>Years</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Sector</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>n</td>
<td>38</td>
<td>58</td>
<td>374</td>
<td>659</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.469</td>
<td>0.277</td>
<td>0.114</td>
<td>0.360</td>
</tr>
</tbody>
</table>

Note: The value of the standard error is indicated in parentheses below the coefficient values, ***p < 0.01; **p < 0.05; *p < 0.1.

Source: compiled by the authors.

Hypothesis 1 (positive impact of uncertainty about the future value of the company on IPO underpricing) was confirmed for the BRICS countries (variable — IPO volume). The impact of uncertainty on IPO underpricing in the BRICS countries can be explained in the following way. In Russia, Brazil and South Africa, only large stable companies that are monopolists or one of the leaders in their industry reach the IPO. So, investors do not demand high underestimation for such companies since they seem to be the least risky. There are also many companies listed on the stock exchange in China, including small ones that are at risk. Consequently, investors demand higher underpricing compared to large companies. Hypothesis 3 (the negative impact of a prestigious auditor on IPO underpricing) was partially confirmed. A reputable auditor is an intermediary between the investor and the issuer. Due to his reputation capital, he reduces the asymmetry of information between them. This gives a positive signal to the market, which reduces the risks for investors. This also confirms Hypothesis 6 (the positive impact of the GDP growth rate on IPO underpricing). During periods of economic growth, investor demand for IPOs increases and is accompanied by excessive optimism. Therefore, the share price may rise much higher than its fair value on the first trading day.

Hypothesis 5 (the negative impact of placing shares on a foreign stock exchange on IPO underpricing) is not confirmed. IPOs on a foreign stock exchange for BRICS companies increases their underpricing. A possible explanation for this is that most of the BRICS companies have a state-owned stake. This could be a negative signal for developed market investors. They consider political disagreements between Russia and China on the world stage and the internal political instability in Brazil. Variables for testing Hypothesis 2 (the positive impact of placing shares at a price above the middle of the price range) and Hypothesis 4 (the positive impact of information asymmetry) are not significant.

Hypothesis 3 is confirmed both for the periods before (2001–2008) and after (2010–2018) the global financial crisis. However, after the crisis, the influence of a prestigious auditor on IPO underpricing decreased by almost 13%, more than twofold. This is probably due to the decline in confidence in the financial markets after the crisis of 2009. Hypotheses
1 and 3 are confirmed only for the period 2001–2008. Rapid economic growth and an increase in the number of IPOs in the BRICS countries occurred precisely in the period before the crisis. There was a marked recession in Brazil, Russia, and South Africa that lasted for several years after the crisis. Only Chinese companies were able to return to the pre-crisis IPO volumes and even increase the number of IPOs compared to the pre-crisis period. It should be noted that in the period 2001–2018, all other things being equal, the GDP growth rate increased IPO underpricing by 2.2%, and in the period 2001–2008, this coefficient increased to 3.7%, which is consistent with our explanation of this phenomenon.

The position of the offer price in the price range becomes significant after the 2009 global financial crisis and confirms Hypothesis 2 (the positive impact of the placement at a price above the middle of the price range). It confirms the existence of information asymmetry between underwriters and investors. An IPO on a foreign stock exchange also affects the underpricing after the crisis. Placing shares on a foreign stock exchange for the post-crisis period increases the underestimation by 2% more than in 2001–2018. In our opinion, some events that can be considered a negative signal for the financial market could have affected this. In particular, political disagreements between Russia and other countries that began after 2013–2014 and the tense relations between China and the United States, which culminated in the trade war. A corruption scandal also erupted in Brazil, which ended with the impeachment of the incumbent president.

We should interpret the models for companies from India and China, as their test results and samples allow us to draw some important conclusions. All other things being equal, a 1% increase in the deviation of the offer price from the middle of the price range increases the underestimation of shares by 0.7% for Indian companies. The average number of underwriters participating in an IPO is 1.9, which is the lowest among the BRICS countries. Based on these indicators, we can draw the following conclusion. The problem of information asymmetry between investors and underwriters in the Indian IPO market is higher compared to the rest of the BRICS countries. Also, a reputable underwriter reduces the underpricing of Indian IPOs by 11.5%, all other things being equal. We assume that the importance of the underwriter’s reputation capital for the Indian IPO market is related to the asymmetry of information between underwriters and investors. Companies use a reputable underwriter as one way of reducing information asymmetry.

As for the IPOs of Chinese companies, the IPO volume affects the underpricing. China is the world leader in the number of IPOs. Companies with different IPO volumes go public. Investors will demand more underpricing for small companies than large ones. Also, all other things being equal, a prestigious auditor reduces the underpricing of Chinese IPOs by 28.4%. It is the largest coefficient for this variable of all the models shown. The Big Four companies did not monopolize the Chinese audit market that much. Local Chinese auditors give audited companies more freedom in preparing financial statements than Western companies. A large proportion of modified audit opinions are typical for Chinese companies. On average, 11% of listed Chinese companies received a modified audit opinion in 1992–2011 (Lin et al., 2011). This phenomenon points to a strong incentive to distort information in China. Consequently, the market is more sensitive to company reports prepared by prestigious auditors. The GDP growth rate also affects the IPO
underpricing for the Chinese companies. China is the only country in the BRICS group that has demonstrated stable economic growth from 2001 to 2018.

To sum up, the significant factors of IPO underpricing for the BRICS companies are the IPO volume, the prestige of the auditor, the GDP growth rate, and the placement of shares on a foreign stock exchange.

4.2. Recommendations for improving the efficiency of IPOs for BRICS companies

The favorable situation in the global markets and the eager activity of the BRICS countries’ companies make it possible to draw up recommendations for improving the efficiency of issuing companies from the BRICS countries, based on the results of our empirical research.

*Chinese companies* should conduct an additional audit of the company with the help of the Big Four companies, as distortion of information in financial statements is typical for the Chinese market. All other things being equal, a prestigious auditor will reduce the IPO underpricing by 28%.

The information asymmetry between the key participants in the IPO is relevant to the *Indian IPO market*. A way to reduce the information asymmetry is to inform investors about the company value using various signals. Indian companies use a reputable underwriter to reduce information asymmetry. In addition to a reputable underwriter, Indian companies should employ prestigious auditors. It will be easier for a company to attract a reputable underwriter to an IPO by working with a prestigious auditor. The combined effect of the auditor and the underwriter on reducing IPO underpricing will be higher.

*In Russia*, the period from the decision to hold an IPO to going public is beginning to shorten. This gives young companies much more opportunities to stay in the market. According to our research, uncertainty about the future value of the company does not have such a strong impact on IPO underpricing in the BRICS countries. Therefore, small and medium-sized companies should consider going public early. One of the ways to reduce uncertainty can be cooperation or a joint project with a large company. Most large companies in the BRICS countries are monopolists or leaders in their industry, which reduces risks.

Over the past year, the *Brazilian IPO market* has seen an excessive number of placements against the background of the government’s cut in the base interest rate and an influx of more local retail investors into the exchange. Brazilian issuers should refrain from placing during periods of severe overheating in the market and wait for a more optimal window for an IPO, as confidence in economic stability in the country increases after the recession and political crises.

Companies from *South Africa* prefer going public on foreign stock exchanges, which, other things being equal, increases the IPO underpricing for BRICS companies. A foreign exchange gives companies access to a much larger number of investors. However, it is worth considering the possibility of a dual listing. Such practice can reduce IPO underpricing and boost the development of domestic markets.
Conclusion

In this article, we identify the impact of various factors on the IPO underpricing of companies in the BRICS countries.

For empirical analysis, we used traditional models previously used in research on this topic. We chose the ordinary least squares (OLS) method for the study. We used the following metrics as factors influencing the IPO underpricing: IPO volume, deviation of the offer price from the middle of the price range, number of underwriters, reputation of the underwriter, a prestigious auditor, a foreign stock exchange, and GDP growth rate. We put forward and substantiated hypotheses about the impact of these factors on the IPO underpricing of companies from the BRICS countries, based on modern scientific studies.

We compiled a sample of 1,141 IPOs of BRICS companies for the period from 2001 to 2018. In addition, we conducted a study for the periods 2001–2008 and 2010–2018, as well as separately for each country. For the period 2001–2018, we revealed a negative impact on IPO underpricing of such factors as IPO volume and a prestigious auditor, and a positive impact of the GDP growth rate and the placement of shares on a foreign stock exchange. For a separate period 2001–2008, we found a negative impact on IPO underpricing of such factors as IPO volume and a prestigious auditor, and a positive impact of the GDP growth rate. For the period 2010–2018, we found a positive impact on IPO underpricing of the deviation of the offer price from the middle of the price range and the placement on a foreign exchange, and a negative impact of a prestigious auditor. Deviation of the offer price from the middle of the price range has a positive effect on the IPO underpricing of Indian companies, while the reputation of the underwriter has a negative effect. As for Chinese companies, we found the negative impact of IPO volume and the prestigious auditor, and the positive impact of the GDP growth rate. We also confirmed the hypotheses about the positive impact of uncertainty about the future company value; the positive impact of the GDP growth rate; and the negative impact of a prestigious auditor on IPO underpricing.

Summing up, in our study, we found that the IPO underpricing in the BRICS countries is influenced to varying degrees by different factors. To maintain the required level of IPO underpricing or its absence, the company must consider the factors affecting it, following the objectives of the IPO and further strategic goals of the company.

References


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