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The Russian Rouble in the Regional and Global Dynamics

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Abstract

The article deals with the issues of Eurasian monetary integration. The topic is especially time-relevant today, for the deepening of the integration in Eurasia is really dependent upon the development of European Economic Union regarding a potential currency union. These regional economic relations require a common monetary market. The prospects of the future regional monetary market of the EEU member states have been proven in the article by an identified link between the mutual trade flows and the currency pair trading at the Moscow Exchange. The author strongly believes that the Eurasian monetary market is going to be an additional and transitional step on the path to achieving the integration in banking, financial and monetary spheres of the EEU member states in the unified economic environment. The author founded his conclusions on the hypothesis that this integration stage can be accomplished through the trading of the national currencies of the EEU member states at the Moscow Exchange.

Keywords: the BRICS; internationalisation of rouble; international monetary system; Eurasian Economic Union, Eurasian monetary integration

JEL Classification: F37

In modern history, the Russian government started to promote the rouble's internationalisation right after the default of 1998. In 2008 converting the rouble into a world reserve currency became one of the objectives of the foreign economic strategy by the end of 2025. To make this happen the government needed to take some steps to internationalise the rules. The internationalisation stages of the rouble we summarised in *Table 1*.

Basically, the rapid liberalisation did not result in a significant spread of transactions in roubles in the international foreign exchange market (Butorina, 2011). It can be explained by the absence of a distinctive idea among the Russian politicians and economic scientists about the direction and the scope of the rouble's internationalisation. For example, given the policy measures were taken by the Russian government to support the rouble's internationalisation it is really difficult to say at which level this is going to be done — on micro level (or on the foreign exchange market), medium level (meaning cross-border currency

and trade transactions), macro level (within the regional free trade agreements, customs unions, economic unions, currency unions, etc.) or mega level (global or international currency use and transactions with capital).

We believe that the problem of the Russian approach to currency internationalisation reveals itself in the willingness of the government for the immediate success of the rouble at the mega-level, a wish to take part in establishing a world multi-currency system, issuing rouble-denominated bonds in the international market, etc. Such a policy excludes a gradual approach. It significantly differs it from the policies of other BRICS countries which consider the currency internationalisation at the mega-level as a long-term or extremely long-term goal (Kaufman, 2001). They, first of all, intended to strengthen the positions of their national currencies within regions or integration agreements. In contrast, the Russian plan practically does not touch the issues of the rouble internationalisation at the macro level, i.e. within

the borders of the CIS or EEU (Avdokušin, Kovalenko, 2012). Trading in the rouble/ renminbi currency pair at the Moscow Exchange, whose first aim was to expand the use of these currencies in the Far East, serve mostly the interests of the Chinese economy and renminbi's internationalisation in Russia, for in the foreign exchange market of Russia renminbi deals and transactions dominate (Binder, 2013).

Rouble's internationalisation, though, may go on at the micro and medium levels, for example, in cross-border settlements in the Far East and trades in currency pair rouble/ renminbi at the Moscow Exchange, as well as at the macro level within the CIS and EEU. The mega level currency internationalisation looks like a longer-term goal, to achieve which special approaches are required (Griesgraber, 2009).

In 2015 there began a search for a new Eurasian idea and conditions to deepen the integration processes between Russia, Belorussia, Kazakhstan, Kyrgyzstan, and Armenia were laid down, which in turn intensified the potential for direct settlements in the national currencies, especially in the period of international sanctions against Russia.

The Agreement on EEU came into power on January 1st 2015. The Agreement was partly dictated by the need to survive in the wave of the international sanctions since Russia hoped to strengthen the link between the former republics of the Soviet Union. Another significant point of the Agreement was determined by the fact that the EEU and the EU are the only integration groupings in Eurasia. The interrelations of the EEU member nations intensify both in cooperation and as separate entities. Within this cooperation, the projects to build common transportation, trade and energy routes are being proposed, reflected in the idea and dream of a new Great Silk Road. The roadmap of the EEU is about filling in each dialogue separately between the member states by specific programmes, projects and plans.

The creation of the Eurasian common market is becoming a global challenge and is a more significant goal in comparison with Russia's participation in the BRICS, because the BRICS is a supranational format of a virtual character, whereas the EEU is an institutionally based sort of integration grouping (Burlačkov, 2012).

The data in *Table 2* show that Russia is a major foreign trade partner for the EEU member countries. For example, Russian products in Kazakhstan and Kyrgyzstan accounted for over 30 per cent of their imports taken together in 2004–2015. Belorussia imports more than 50 per cent of its goods from Russia. And the figure for Armenia exceeds 20 per cent. In the EEU's exports, though, Russia's share is less impressive. In 2015 Kazakhstan exported 5.2 per cent of its GDP to Russia, Belorussia — 38.5, Armenia — 23.5 and Kyrgyzstan — 7.2. What is important to note in the EEU's trade flows is that Russia's share both in the imports and exports of the member nations gradually declines from year to year. For example, if in 2004 Belorussia imported from Russia 68.2 per cent of all imported goods, then by 2015 this figure declined to 51.2 per cent. An exception to the rule is Armenia whose imports from Russia remain quite stable. In 2010–2015 Russia's share had even increased a little bit. Decreasing share of Russia in the foreign trade of the EEU's countries can be explained by increasing the volume of Chinese goods in their exports and imports. So, in 2004–2015 Kazakhstan's exports to China almost doubled, whereas its imports from China even more than tripled. In the same period, the share of the imported goods from China to Kyrgyzstan went up from 8.5 to 27.4%. However, Kyrgyz's exports to China dropped from 5.5 to 1.4%. In the Belorussian imports, China's share increased from 1.0 to 5.7 per cent (*Table 3*).

For Russia itself, the significance of the EEU in foreign trade in the period under consideration remained almost unchanged. The share of Russia's exports to Kazakhstan fluctuated within 2.7–3.0 per cent, Armenia — 0.1–0.2, and Kyrgyzstan — 0.1–0.4 per cent. The sharpest decrease in Russian exports and imports to EEU took place in the mutual trade with Belorussia whose exports went down from 6.2 to 3.5 per cent, on the other hand, the imports decreased from 8.6 to 3.3 per cent.

For China itself, though, among the EEU's member states, Russia is the most important of trading partners. China's share in the Russian exports increased in 2004–2015 from 1.5 to 2.3 per cent. Russia's share in the Chinese exports remained almost unchanged in the same period — 2.1 per cent. All other EEU's member states account for a very little share in the regional trade.

The exception is Kazakhstan that exported to China 0.6 per cent of its products in 2015, i.e. 0.2 per cent bigger than in 2004. On the other hand, Chinese imports to Kazakhstan doubled from 0.4 to 0.8 per cent (*Table 4*).

These dynamics mean for Russia a decrease of potential to integration within the EEU. And with it, the country loses opportunities for wider use of the rouble in the region, i.e. at the macro level of the currency internationalisation process. For China, though, this situation lays the foundation for the renminbi's internationalisation in the EEU. The central banks of the EEU's member nations, except for Armenia, have existing swap agreements win the People's Bank of China to the total amount of 177 billion dollars, namely 150 billion is accounted for Russia, 20 billion — Belorussia, and 7 billion — Kazakhstan. So, it all helps more Chinese yuan than Russian rouble.

For deepening the currency cooperation within the borders, it is needed intensifying the EEU trading in currency pairs of rouble to Belorussian rouble and Kazakhstan's tenge at the Moscow Exchange. These could become the basis to purchase the national currencies in mutual settlements as currencies of the commercial contact. Trades in the currency pair KZT/RUR began on November 29th 2012 and in the currency pair BYR/RUR on June 13th 2013 (*Fig. 1*).

Initially, trading in these currency pairs was occasional, and the volumes were very small. Regular trading in these currency pairs started from August 2014. Nevertheless, by the end of 2014 — early 2015 the trading in the currency pair KZT/RUR became irregular. The trading was now occasional and characterised by long breaks in the sessions. In contrast, the trading in currency pair BYR/RUR was distinguished by quite a stable and regular pattern. The volume of trades in currency pair BYR/RUR rose more than 30 times at the Moscow Exchange from 0.16 million dollars in 2013 to 4.3 million dollars in 2015. The trades in currency pair KZT/RUR also increased. They skyrocketed 60 times its original volume and amounted to 0.4 million by the end of that period. Regarding other currency pairs, this is a still very small volume, but this is the start. However, despite the high growth rate in these currency pairs their total is not enough to cover the mutual trade between Russia and Belorussia and Russia and Kazakhstan (*Fig. 2*).

A factor which seriously hampered the process of the rouble's internationalisation in 2014–2016 at the macro level has been the unfavourable foreign economic environment, namely the embargo on imports from the advanced countries of Western Europe and America and a drop in world oil prices. These factors under the free-floating regime caused a sharp decrease in the rouble's foreign exchange rate and devaluation, namely:

1) A drop in world energy prices led to a significant decrease in budget revenues in the form of a convertible currency and tax payments which forced the government to increase taxes and led to a fall in aggregate demand;

2) The embargo on imported products into Russia resulted in an overall reduction of merchandise and aggregate supply in the national marketplace, which stimulated inflation and precipitated the rouble's devaluation;

3) The rouble's devaluation made economic actors accumulate hard foreign exchange, thus raising demand for the dollar or the euro and hence provoking a further devaluation of the rouble;

4) under free float of the rouble the foreign exchange supply at the interbank market was very limited so that the demand for the highly liquid convertible currencies could not be fully satisfied when speculative pressure would have stopped influencing the rouble's demise;

5) The conditions of the free-floating regime dictated the use of indirect methods of foreign exchange market regulation, including the increase in the rate of refinancing. It, in the end, led to a decrease in providing loans necessary for the business;

6) Weakening purchasing power resulted in an acute situation in the sphere of credit. There was an increase in consumer debt and a sharp drop in new loans;

7) Fewer loans led to the reduction of banks' income, and the liquidity crisis could have become a possible outcome.

At the same time, supposing that if Russia still stuck to the regime of the currency corridor, then the attempts to regulate the rouble's exchange rate using central bank interventions could have exhausted the gold and foreign exchange reserves of the country, which in the end again precipitated the liquidity crisis. It means that the rouble's devaluation under the free-floating regime

became a factor which prevented the spread and deepening of the economic and financial crisis in the country. However, due to lack of diversified manufacturing in the country, when the drop in price competitiveness of the imports and the volume of imports could have stimulated the development of exports and import substitution as well as the reduction in financial capital outflow that had been before used to cover the deficits, the financial and economic crisis in Russia took a prolonged aspect and showed that to overcome it the rouble's devaluation alone was not sufficient under the free-floating regime (Jordà, Schularick, Taylor, 2011).

The period of 1999–2008 was relatively sustainable. The rouble even strengthened on a regular basis. However, in August 2008 because of the world financial and economic crisis of 2008–2010 the rouble began its overall weakening (Lane, Milesi-Ferretti, 2011).

By March 2009 there came a period of a relative exchange rate stabilisation. However, the overall trend pointed out to its gradual drop. Starting from January 2012 this common trend became evident, and the rouble continued to devalue. However, the pace of the devaluation was not high in 2012–2014. A drop in the rouble's exchange rate at this time we link with the foreign exchange policy of the US, when the dollar issuance inside the country to overcome the crisis caused significant fluctuations in the raw materials' prices, food supplies, etc., which in the end destabilised the exchange rates of many countries including the BRICS. The stability and sustainability of the WSC largely depend on the stability and sustainability of the US economy and the dollar as the world currency. Thus any changes in economic growth rate in this country and the value of its national currency immediately affect the performance of the world and national economies which can be seen in exchange rates fluctuations, rising unemployment, current account deficit, etc. (Wade, 2008).

For the Russian economy rouble's internationalisation means:

1) Decreasing reliance on the gold and foreign exchange reserves on the dollar accumulation;

2) A possibility to carry out international transactions in the national currency, first of all, with the neighbouring countries and leading trade partners, especially China;

3) Far-reaching reforms of the national financial market, in particular, the creation of an international financial centre in Moscow;

4) Attracting foreign capital of the countries that are ready to transact with Russia in national currencies and to purchase roubles at the Moscow Exchange to denominate Russian imports, which will increase the demand for roubles and strengthen its foreign exchange rate;

5) Taking full responsibility towards the foreign trade partners of Russia which requires a special monetary policy that excludes uncontrolled issuance and accumulation of enormous debt.

To achieve these goals the Bank of Russia declared in 2010 that the rouble is to become a free-floating currency. This process was completed by 2014. However, despite accepting this regime, the Bank of Russia is still responsible for sustaining the exchange rate of the rouble in case of force-major circumstances, which requires active interventions to stabilise the exchange rate of the rouble to the dollar and the euro.

The process of rouble's internationalisation in 2010–2014 was characterised of expansion mainly in the regional foreign exchange market. According to a survey of VTB Bank, the share of rouble-denominated transactions accounted for about 4 per cent of the total foreign economic operations at that time. Also according to the VTB data, approximately 30 per cent of all foreign trade transactions connected with providing specific services, i.e. tourism, railroads, pipelines, etc., was expressed in roubles. Within the CIS this figure exceeded 50 per cent.

These dynamics characterise the process of rouble's internationalisation at the macro level. First of all, this is determined by very small volumes of trading in the EEU member countries' currencies at the Moscow Exchange which does not meet the needs of their mutual trade (Schindler, 2009). The rouble's internationalisation at the macro level has a chaotic character.

Not a less important cause for stalling the rouble's internationalisation process at the macro level is the autarky or unwillingness to accept the rouble in the neighbouring countries as a transactions currency. This autarky is directly connected with the liquidation of the rouble zone in 1993–1994, the increasing share of China in foreign trade with the countries within the

immediate proximity of the Russian border and a general economic instability of those neighbours which makes their residents create deposits, reserves and other funds in the hard currency (Goldberg, Cédric, 2008).

The rouble's internationalisation in 2008–2014 as the experience of other currencies suggest required the circulation of international bonds denominated in roubles. However, compare to the yuan-denominated bonds the volume of the Russian debt securities expressed in roubles in the international marketplace (rouble bonds) was significantly lower. According to the Bank for International Settlements, as of the end of 2015, the volume of Russian international bonds expressed in roubles amounted to 0.4 billion dollars, whereas the figure for China equalled to 11.3 billion dollars, that for Brazil — 1.1 and South Africa — 0.3 billion dollars. India in this period temporarily discontinued the issuance of international bonds expressed in rupees. Among the EEU member states, only Belorussia purchased government bonds denominated in Russian roubles but later refused. Large Russian companies issued a very small volume of rouble bonds abroad. The overwhelming majority of their debt abroad is expressed in dollars and euros. Such a small amount of debt issue in roubles by the Russian corporations is because their circulation cost much more expensive than the bond issue expressed in dollars or euros. That is why for the more active promotion of the rouble bonds onto the Eurobond market we have to reduce transactions costs.

One more indicator of Russia's participation in the banking sector is the rise in the number of foreign financial institutions, which may become a very important factor for the increase of rouble's use in transactions with foreign companies. For example, the number of foreign banks in Russia was at 130 in 2000–2005. At the beginning of 2006, the figure started to rise dramatically. By 2010 in this increasing trend there was a start for negative dynamics as a result of the crisis of 2008. In 2012 the number of foreign banks in Russia peaked 237. At the same time, there was a rise in the share of foreign capital in the total banking capital of Russian financial institutions. However, the situation changed completely since the start of international sanctions. And the foreign banks started to withdraw. However, after

joining the WTO this situation helped a bit, for the Russian commercial banks in their majority are not so competitive as the foreign ones, and the international sanctions froze the competition in the Russian banking market.

Foreign banks presence in Russia expanded in the pre-sanctions period due to the increase in the number of foreign companies in the manufacturing and services industry who were saturating the Russian market in expectation of high growth rates. One of the reasons behind the rise in foreign banks' presence in Russia was the liberalisation of the banking legislation, especially after Russia's joining the WTO. As a result of this, the share of foreign banking capital in the total volume of the Russian banks capital rose from 12 to 50 per cent. However, this again changed because of the international sanctions.

Besides the EEU, the prerequisites for the rouble's internationalisation in the border region started to shape in the foreign exchange markets of Moscow and Shanghai. Since Russia is still importing huge volume of Chinese manufacturing products, there is a serious potential for the development of exports and imports in roubles and renminbi between the two countries (Yu, 2014).

The economic effect for the Russian economy from direct settlements with China, for instance, we can calculate by way of determining the difference between the exports/imports value of both Russia and China expressed in roubles at the Bank of Russia exchange rate and the same amount expressed in roubles exchanged at a rate of the currency instruments to buy and sell roubles and renminbi agreements renminbi at the Moscow Exchange.

According to the author's estimates, if during 2012–2015 Russia imported from China and exported to China in terms of direct settlements in national currencies, then the excess of the import/export volume at an average exchange rate of the currency vehicles at the Moscow Exchange over the export/import value measured at the official exchange rate of the Russian central bank would have amounted to 4 billion roubles in case of imports and 2.6 billion roubles in case of exports. These figures represent a potential amount of the roubles circulating in case of direct foreign trade with China.

The outcomes of such circulation for the Russian economy could be as follows:

1) Seigniorage, i.e. the Bank of Russia's revenue as a result of the additional issue of roubles onto the foreign exchange market;

2) Strengthening rouble's exchange rate due to creating demand for it on the part of the Chinese importers of the Russian products;

3) The reduction of dollars in the gold and foreign exchange reserves and the possibility of their diversification in terms of assets denominated in the currencies of the most rapidly developing countries, especially and particularly the renminbi;

4) Intensifying speculative transactions with the rouble in the foreign exchange market, which requires a special control and monitoring on the part of the central bank;

5) cross-border transactions in roubles and renminbi between Russia and China would mean the establishment of a new foreign exchange market and may lead to creating a yuan offshore centre in Moscow and a rouble offshore centre in Shanghai.

The Russian rouble is under the influence of significant changes in the world commodity markets as well as other economic and political factors which does not allow increasing foreign investors' trust towards the national currency and the economy as a whole. The dynamics of the Russian rouble practically coincides with the world energy price dynamics, namely when world prices for oil, gas and other minerals increase, the Russian exports are driven up, rouble's exchange rate stabilises and gets sustainable. And vice versa, when energy prices decrease, exports drop as well. Together with this, the residents' and non-residents' trust towards the rouble suffers, and its exchange rate decreases. It means that it is very difficult under these circumstances to support the trust towards the rouble and try to expand its use abroad. The same goes for the rouble to become a regional or international currency.

For rouble's internationalisation the economy should be transformed to a higher level of technology and manufacturing, develop a diversified structure of the industries to expand the circulation of this currency in foreign transactions, in particular within the EEU in order to strengthen the country's competitiveness in contrast to Chi-na which actively penetrates in the EEU member states. The rouble should also be able to generate trust to stimulate foreign direct investment and portfolio investment denominated in rouble.

The rouble should also be stored in the form of deposits and rouble bonds in the EEU. The realisation of these goals requires the re-industrialisation of the economy, the introduction of new technology and attractiveness for foreign investors to improve the international competitiveness of the country. There must also be ways to ensure the growth of the rouble's power parity in the national, regional and international marketplace.

To achieve the goals of the Russian foreign economic strategy aimed at expanding rouble's presence in cross-border transactions a mid- and long-term approach is needed. For example, in the mid-run bilateral currency swaps are required to be concluded with countries within the immediate proximity of the country's borders, especially it concerns countries with which Russia has close economic ties, i.e. the EEU, which will help internationalise the rouble at the macro level. Bargaining bilateral swaps to ensure the supply of liquid assets are required not only for the period of a crisis but also for the development of trade and investment links with these countries. A long-term goal should become the creation and development of an offshore currency centre to trade in renminbi at the Moscow Exchange, which can further incentivise the rouble's internationalisation in the future.

While modernising the economy of Russia, changing the exports structure and creating closer economic ties with the EEU and the BRICS in the long run Russian rouble might be expected first to achieve the status of a regional currency and later an international one (Kadayan, 2014). However, even optimistically, the pace of rouble's internationalisation will still longer be quite moderate and proceed during a very long time.

The crucial conditions for the BRICS currencies' internationalisation include free and full convertibility and the free-floating regime of exchange rates, unregulated by the central bank even indirectly. To ensure the efficient functioning of this regime under the conditions of openness to the outside world what is needed is the development of the currency and financial centre, which mostly translates into

the diversification of financial instruments in a portfolio of assets at a foreign exchange market. In the foreign exchange markets of the BRICS currency pair rouble to US dollar is the most frequently used. To this end, it is important to increase the supply of currency instruments in which an obligatory condition is trading in pairs with the immediate participation of the BRICS currencies. It means that a deeper internationalisation of the BRICS currencies at the macro level is significantly dependent upon the internationalisation at the micro level.

Since the foreign trade environment seriously impacts the rouble's exchange rate under the conditions of the free float, it is recommended that the mechanism of the commercial exchange rate should be used. Making use of this mechanism Russia will be able to a certain extent stabilise the rouble's exchange rate and finance current-account deficits with China, for example, using setting a specific commercial exchange rate. This exchange rate is an invisible subsidy to domestic companies working both in the national and international markets. It could also help Russia, being a member of WTO, regulate its foreign trade using the indirect methods one of which is a commercial exchange rate of the rouble to the dollar on exports and imports for each of its foreign trade counterpart (Kasekende, Brixova, Ndikumana, 2010).

Under rouble's internationalisation, it is necessary to make clear at which level and with what sequence its circulation abroad should be expanded. For example, the macro level internationalisation of the BRICS currencies should precede their going global when their circulation takes a worldwide scope, whereas micro and medium level internationalisation requires a deeper integration of the countries within the regional agreements using creating special market niches for trading in the national currencies at the domestic, foreign exchange markets.

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Table 1
Basic stages of the rouble's internationalisation in 1996–2018

Stage	Period	Description
1	June 1996	The liberalisation of the foreign trade deals
2	July 2006	The liberalisation of the external economic transactions with capital. Rouble becomes a fully convertible currency
3	November 2010	The complete ban on the currency board or currency corridor introduced in the mid-1990s
4	November 2010	The launch of trades in rouble/yuan currency pair at the Chinese Foreign Exchange Trading System in Shanghai
5	December 2010	The introduction of full convertibility of the yuan into the rouble and back. Belorussia issues bonds denominated in roubles. However, the latter was later abandoned in 2017.
6	June 2011	Banks in China start to receive deposits in roubles
7	July 2011	Chines commercial banks open corresponding accounts LORO and NOSTRO at their subsidiaries in the cross-border region between Russia and China. These accounts can be denominated not only in US dollars but in roubles and renminbi as well
8	September–December 2011	The governments of Russia and China sign an agreement on mutual trade stimulation by transacting in the national currencies in foreign trade deals
9	2009–2015	In the course of a series of BRICS summits, the leaders signed and developed mutual documents on the reform of the international system of currencies and the diversification of the global liquidity by introducing to it the national currencies on par with other reserve currencies such as British pounds or Swiss francs. It is believed to be a stabilising factor for the shaky international financial system
10	2014–2015	The establishment of the New Development Bank, later to be called the BRICS Development Bank which can be a platform for future transactions in the BRICS currencies
11	2015–2018	International sanctions put pressure on the rouble. Rouble devaluation. At this point hopes for wider rouble internationalisation failed
12	Prognosis	The rouble is going to stabilise at an exchange rate competitive enough to keep at least a slight economic growth. Further and deeper devaluation is possible in case of a sharp drop in the world oil prices. But even then the rouble is still going to be stabilised at a rate competitive enough to export and make foreign companies keep away from the domestic market

Source: compiled by the author.

Table 2
The share of China and Russia in EEU's exports and imports (without Russia), %

Indicator	2010	2011	2012	2013	2014	2015	2016
Kazakhstan							
The share of Russia in the exports	5.3	8.5	7.3	7.0	6.6	5.2	9.5
The share of Russia in the imports	22.8	42.8	38.4	36.2	33.3	34.0	36.3
The share of China in the exports	17.7	18.5	17.9	17.4	12.5	18.6	11.5
The share of China in the imports	16.5	13.2	16.8	16.8	17.9	19.8	14.6
Belorussia							
The share of Russia in the exports	39.4	34.8	35.1	45.0	41.8	38.5	45.8
The share of Russia in the imports	51.8	54.0	58.8	52.5	54.0	51.2	54.5
The share of China in the exports	1.9	1.5	0.9	1.2	1.8	1.1	1.7
The share of China in the imports	4.8	4.7	5.1	6.6	2.3	5.7	7.6
Armenia							
The share of Russia in the exports	15.4	16.7	20.3	22.6	19.9	23.5	21.1
The share of Russia in the imports	22.3	16.6	18.3	23.4	24.7	24.6	29.2
The share of China in the exports	3.0	1.2	2.3	4.7	11.0	10.3	10.5
The share of China in the imports	10.8	5.0	4.9	8.8	9.4	8.1	11.1
Kyrgyzstan							
The share of Russia in the exports	17.3	14.4	13.0	8.6	4.2	7.2	10.2
The share of Russia in the imports	33.6	33.6	33.2	33.2	28.2	31.7	20.8
The share of China in the exports	1.9	2.1	3.6	2.2	2.1	1.4	5.6
The share of China in the imports	20.7	21.7	22.5	23.9	23.3	27.4	38.1

Source: compiled by the author.

Table 3
The share of the EEU in Russian exports and imports, %

Indicator	2010	2011	2012	2013	2014	2015	2016
Kazakhstan							
Export	2.7	2.7	2.8	3.3	2.8	3	3.3
Import	1.9	2.3	3	1.8	1.9	1.6	2.0
Belorussia							
Export	4.6	4.8	4.1	3.2	3.3	3.5	4.9
Import	4.3	4.7	4.1	4.4	4.3	3.3	5.2
Armenia							
Export	0.2	0.2	0.2	0.2	0.2	0.2	0.3
Import	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Kyrgyzstan							
Export	0.2	0.2	0.3	0.4	0.4	0.4	0.4
Import	0.2	0.1	0.1	0.0	0.0	0.0	0.1

Source: compiled by the author.

Table 4

The indicators of the closest correlation between the mutual trade volumes of Russia, Belorussia and Kazakhstan and the currency pay to trade in Russian and Belorussian roubles and Kazakhstan tenge at the Moscow exchange

	Belorussia and Russia		Kazakhstan and Russia	
	Exports/Trading	Imports/Trading	Exports/Trading	Imports/Trading
Q1 2014	–	0.78	0.94	–
Q2 2014	0.80	–	–	–
Q3 2014	0.99	–	0.99	–
Q4 2014	0.99	0.91	–	0.99
Q1 2015	–	–	–	0.93
Q2 2015	0.80	–	–	0.99
Q3 2015	–	0.95	–	–
Q4 2015	0.88	0.68	–	–
Q1 2016	–	–	–	–
Q2 2016	0.83	–	0.82	0.91
Q3 2016	0.93	0.86	0.78	–
Q4 2016	–	–	0.83	–
Q1 2017	–	0.82	0.98	0.98
Q2 2017	1.00	0.95	–	–
Q3 2017	–	–	0.96	–
Q4 2017	**0.74**	**0.96**	**0.99**	**0.97**

Source: compiled by the author.

Table 5

The basic indicators of mutual trade, labour and works and services of Russia, Belorussia and Kazakhstan and trading in currency pairs Russian rouble/Belorussian rouble and Russian rouble and Russian rouble/Kazakhstan tenge at the Moscow Exchange

Period	Belorussia		Kazakhstan		Moscow Exchange trading						
	Exports, bn. USD	Imports, bn. USD	Exports, bn. USD	Imports, bn. USD	RUR/BYR, bn. BYR	RUR/BYR, mln RUR	Fixing of the rouble to dollar exchange rates	RUR/KZT, M USD	KZT/RUR, mln RUR	KZT/RUR, mln RUR	KZT/RUR, M USD
Q1 2014	5.0	3.0	3.1	1.8	0.8	2.7	35.1	80.5	3.0	0.7	19.4
Q2 2014	5.3	3.4	3.8	1.9	0.6	2.2	35.0	63.4	0.0	0.0	0.0
Q3 2014	5.1	3.5	3.8	2.0	2.6	9.1	36.2	252.0	31.4	6.4	172.9
Q4 2014	4.6	2.8	3.6	1.7	5.6	26.0	47.6	497.0	29.1	7.4	161.8
Q1 2015	3.5	1.8	2.5	1.2	11.0	46.2	63.3	736.5	15.1	5.1	82.2
Q2 2015	4.1	2.4	3.0	1.5	17.5	62.9	52.7	1191.8	9.7	2.8	51.5
Q3 2015	3.8	2.5	2.6	1.2	17.8	68.3	63.1	1089.1	38.5	12.7	200.3
Q4 2015	4.0	2.3	2.6	1.0	23.3	85.0	66.0	1285.2	13.2	2.9	43.4
Q1 2016	3.2	1.8	1.8	0.8	13.2	49.0	75.2	650.8	4.2	0.9	11.6
Q2 2016	3.8	2.5	2.3	0.9	11.0	36.3	65.9	550.9	3.2	0.6	9.2
Q3 2016	3.3	2.6	2.4	0.9	11.1	36.5	64.6	565.2	81.3	15.0	231.6
Q4 2016	3.8	2.8	3.0	1.0	9.2	27.6	63.0	438.1	15.8	5.1	80.4
Q1 2017	4.0	2.5	2.7	1.2	6.0	18.5	58.7	315.9	117.9	22.4	384.1
Q2 2017	4.4	2.6	2.9	1.2	8.7	26.6	57.1	465.6	140.7	26.7	465.2
Q3 2017	3.7	2.0	2.7	1.4	–	–	–	144.5	–	–	94.2
Q4 2017	4.1	2.5	3.2	1.5	–	–	–	524.6	–	–	14.9

Source: compiled by the author.
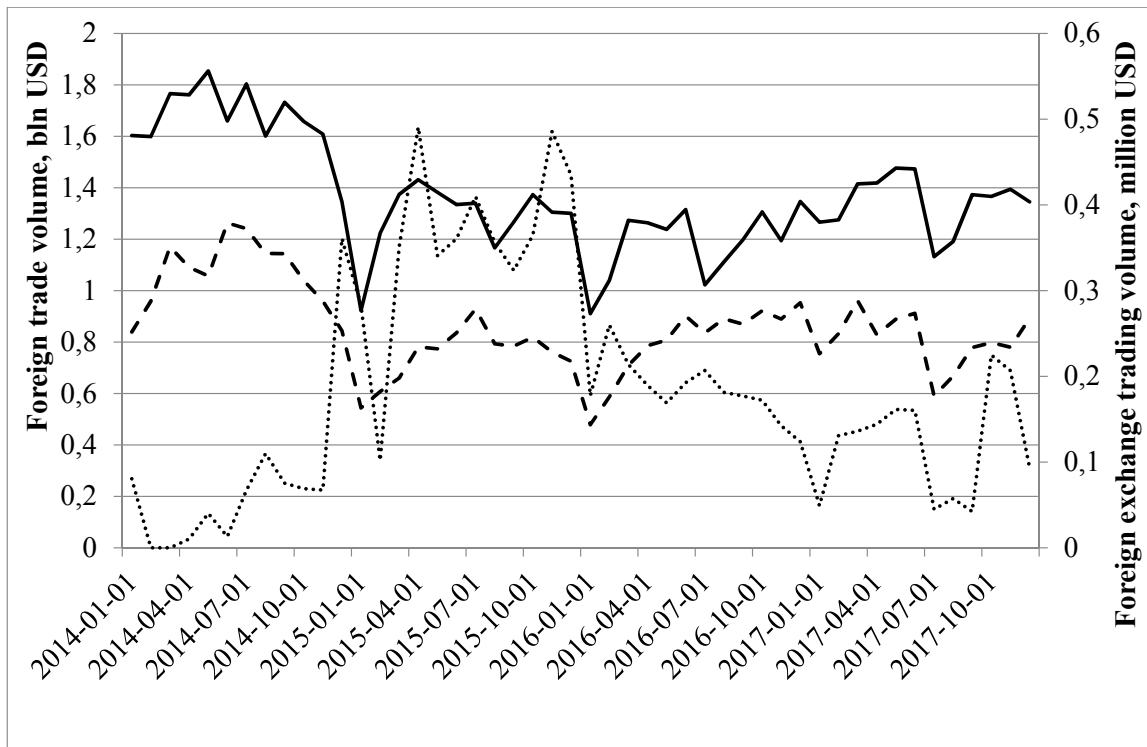
Fig. 1. The dynamics of the mutual trade flows between Russia and Belorussia and currency trading volumes at the Moscow Exchange.

Source: compiled by the author.
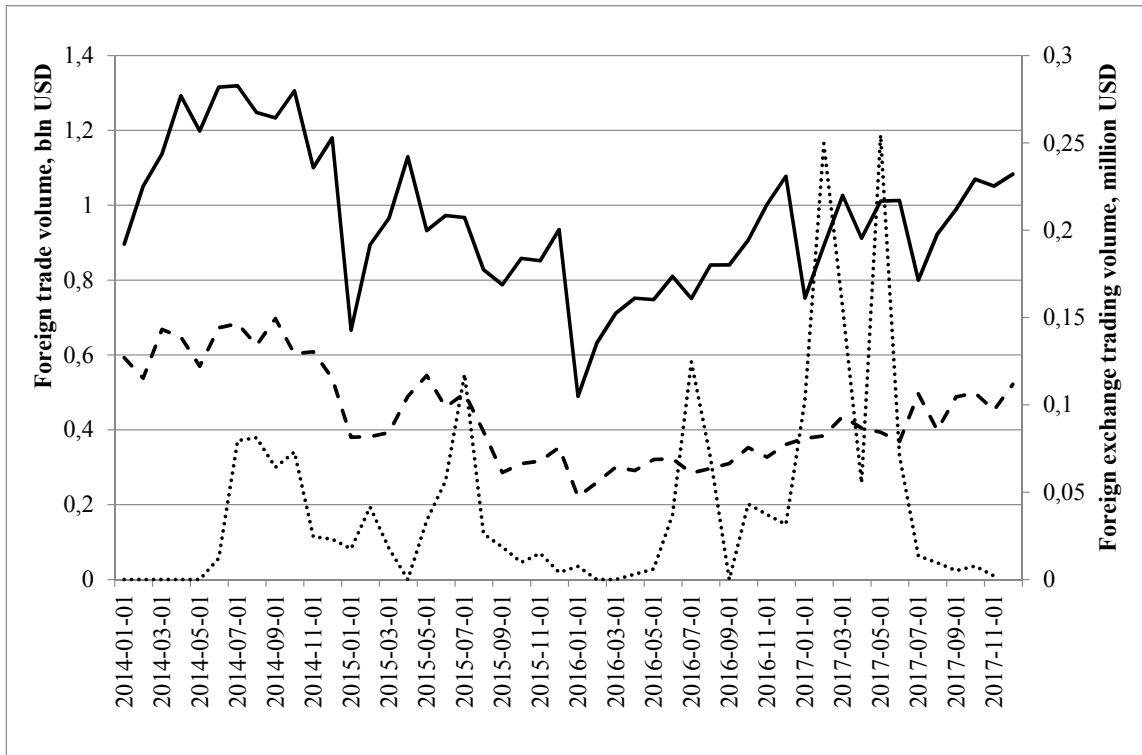
Fig. 2. The dynamics of the mutual trade flows between Russia and Kazakhstan and currency trading volumes at the Moscow Exchange.

Source: compiled by the author.

Российский рубль в региональной и глобальной динамике

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Аннотация. В статье проведен анализ проблем евразийской валютной интеграции. Эта тема особенно актуальна в настоящее время, поскольку углубление евразийского интеграционного процесса напрямую зависит от качества развития Евразийского экономического союза в случае формирования потенциального единого валютного союза. Эти региональные экономические отношения требуют создания единого валютного рынка. Перспективы формирования регионального валютного рынка стран-членов ЕЭС доказаны в статье на основе высокой корреляции между взаимными торговыми потоками и торговлей валютами с участием российского и белорусского рублей и казахстанского тенге на Московской бирже. Автор утверждает, что в рамках единого экономического пространства евразийский валютный рынок представляет собой дополнительный, переходный этап на пути к достижению интеграции в банковской, финансовой и валютной сферах стран-членов ЕЭС. Основные выводы и результаты статьи опираются на гипотезу о том, что валютная интеграция в рамках ЕЭС достижима при более активном использовании национальных валют при внешнеторговых расчетах и торгах на Московской бирже.
Ключевые слова: страны БРИКС; интернационализация рубля; международная валютная система; Евразийский экономический союз; евразийская валютная интеграция

External Debt Problem and Global Financial Architecture

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Abstract

Liberalisation of the global financial market in 90-s last century and early in XXI has resulted in increasing dependence of many countries (both advanced and developing ones) on external financing and significant growth of the sovereign external debts that has become a real threat to the stable development of the world economy. The paper is focusing on the problem of growing external debt of many countries. It has an analysis of the methods aimed at settling and managing the external debt by the state authorities. I paid special attention to the problem of predicting the possibility of the sovereign external debt default. The author concludes that an aggravation of the global external debt problem may become one of the main triggers of a deep financial and economic crisis not only in separate countries or a group of related countries but on a global scale.
Keywords: external debt, debt securities, default, solvency criterion, regulation of external borrowings.
JEL Classification: F34

Introduction

Financial and economic globalisation has significantly increased the total amount of external debt of the different countries of the world. Over the past twenty years, the total amount of international debt market (including outstanding debt securities and syndicated loans) has increased by ten times and reached US$ 28–29 bln. If we take into account non-market funds (including loans from international financial organizations, intergovernmental loans, bilateral loans from commercial financial and non-financial institutions, and so on), the total volume of global external debt, according to our estimations, based on the World Bank data for separate countries, early in 2016 amounted to approximately US$ 73.7 tn. As a result, the ratio "global external debt/global GDP" has exceeded 100 per cent (100.3 per cent).

In the structure of gross external debt of the various countries of the world, the ratio between government and corporate borrowings is significantly different. According to the World Bank, in Singapore, for example, in 2016 there was no external government debt at all, in Luxembourg, the share of external

public debt amounted to a few tenths of a per cent only. At the same time, in such countries as Uruguay and Greece, the share of public external debt was around 60 per cent, while in Ecuador — 71 per cent.

Major Indicators of the External Debt Burden

There is no single "best" indicator for analysing general government debt (Bloch, Fall, 2015). When assessing the external debt sustainability of the country, various ratios are applied. For example:
- External debt/Exports of goods and services;
- Payments on external debt/GDP;
- Payments on external debt /Exports of goods and services;
- International reserves/External debt;
- External debt/Population;
- International reserves/Payments on external debt

The most popular indicator of the external debt sustainability of the country is the ratio of the gross external debt to GDP. By the recommendations of the IMF, the ratio of the gross external debt to GDP expressed as a percentage reflects a certain degree

of external debt risks of the various countries. If this ratio is less than 30 per cent, the degree of risk is low. From 30 to 50 per cent — it is an average risk of external debt. The high risk appears if this figure exceeds 50 per cent. In the different countries of the world, this ratio varies considerably.

Table 1 shows the ratio of gross external debt to GDP of the top ten countries leading regarding the value amount of external debt early in 2016.

The table shows that early in 2016 all the top ten countries were in the "high-risk" area. Please note that almost 97 per cent of the gross external debt of Luxembourg and almost 93 per cent of the gross external debt of Ireland fell on the corporate sector. Banks and companies from different countries actively register their subsidiaries and affiliates in Luxembourg and Ireland for the organisation of external debt financing and use tax benefits and favourable conditions for doing business in these countries.

If we take into account the debt counter-claims of different countries leading regarding the gross external debt, the situation is somewhat different. It is evident in the example of the euro area (see Table 2).

As can be seen from the table, some European countries are net lenders (Germany, Ireland and Luxembourg) and others are net borrowers (France, Italy, Greece, the Netherlands, Spain). Such division of the different countries of the world into the net lenders and net borrowers is a specific feature of the current structure of the global external debt. On the one hand, there are lending countries, including, for example, China, Japan, South Korea, Russia, Hong Kong, Israel, Norway, Singapore, South Africa, and on the other hand, there are borrowing countries: USA, Australia, Brazil, India, Mexico, the Philippines, Turkey, Kazakhstan, Ukraine, and others. There is a split between countries benefiting from debt assumption and those that must bear its costs (Steinbach, 2015). As a result, one of the major imbalances of the current global financial architecture (the so-called "external funding imbalance") has formed (Reforming global financial architecture and the Russian financial market, 2016).

Very often to assess the external debt sustainability of the country the ratio "International reserves/External debt" is used. This ratio also highly differs in various countries of the world. According to the World Bank data, in 2015, for example, it was 2.5 per cent in Japan, in the United States — 46.2 per

Table 1
The ratio of gross external debt and GDP, %

Country	Early in 2016
USA	98.7
United Kingdom	289.7
Germany	146.6
France	205.6
Luxembourg	6204.0
Japan	71.4
Italy	123.1
Netherlands	534.6
Spain	164.6
Ireland	1018.6

Source: calculated by the author by World Development Indicators. The World Bank Data. Available at: http://databank. worldbank.org/data/reports; http://databank.worldbank. org/data/views/reports/ReportWidgetCustom.aspx? Report_Name=Table-1-SDDS-new&Id=4f2f0c86 (accessed 28.05.2018).

Table 2
The ratio of net external debt and GDP in some euro area countries, III quarter 2016

Country	%
France	40.8
Germany	− 9.9
Italy	61.0
Greece	135.9
Netherlands	32.2
Spain	93.6
Ireland	−363.8
Luxembourg	−2303.1

Source: completed by the author by the Eurostat data. Available at: http://ec.europa.eu/eurostat/data/database (accessed: 22.05.2018).

cent and Russia — 64.5 per cent. About the degree of coverage of the gross external debt of the developed countries leading regarding the value amount of the gross external debt by their international reserves, except Japan, the average amount of the nine developed countries is only 2.1 per cent.

The problem of Growing External Debt

If any state faces difficulties in servicing its external debt, it means that the country is experiencing an external debt crisis. When a sovereign borrower

Table 3
Changes of the gross external debt in 2004–2015, $ millions

Country	01.01.2005	01.01.2010	01.01.2014	01.01.2015	01.01.2016
USA	8361088	13661791	16487771	17258054	17710435
United Kingdom	6638694	9409468	9481342	9219399	8186626
Germany	2932992	5114139	5445610	5597022	4893111
France	2853237	5164310	5549883	5496291	4979756
Netherlands	2788548	2202080	4524147	4153963	3949045
Luxembourg	1070455	2086400	3585282	3330628	3747382
Japan	1557059	2551151	2818871	2726442	2945062
Italy	1649008	2424141	2618726	2459288	2256637
Spain	1235785	2531670	2252897	2064068	1972936
Ireland	1052284	2531162	2212660	1959963	2424379

Source: calculated by the author by World Development Indicators. World Bank Data, Retrieved from http://databank.worldbank.org/data/reports; http://databank.worldbank.org/data/views/reports/ReportWidgetCustom.aspx? Report_Name=Table-1-SDDS-new&Id=4f2f0c86.

makes a single default on the scheduled payments related to servicing its external debt, it is considered to be a technical default. If within a certain period (for example, 30 days), the indebted state does not repay its current debt, in this case, a sovereign default may occur, that is the indebted state is unable to carry out its external debt obligations to international lenders. According to C. Reinhart and K. Rogoff (2009), for the period from 1800 to 2009, 250 cases of sovereign external debt default were recorded in the world. Of these, 170 cases occurred after World War II. It means that sovereign external debt defaults occur more frequently. If in the XIX century and the first half of the XX century one sovereign default on average occurred once every two years, then the last 50 years it on average occurs every four months.

Until the early 80s of the last century, external debt problems periodically appeared in some countries due to the economic crisis and military actions (Zvonova, 2002). However, in the early 80s of the last century, when the difficulties with external debt service began to be experienced by not separate countries but groups of countries in specific regions of the world (especially in Africa and Latin America), the problem of the growing external debt and its impact on the economic development of separate countries and international economic relations in general, has become the focus of attention of economists and politicians. Debt

Table 4
The amount of the gross external debt, III quarter 2016, US$ millions

Country	III quarter of 2016
USA	18,250,154 (II quarter, 2016)
United Kingdom	8,005,297
Germany	5,328,872
France	5,454,958
Netherlands	4,166,091
Luxembourg	3,899,871
Japan	3,646,241
Italy	2,389,868
Spain	2,109,948
Ireland	2,273,971

Source: calculated by the author by World Development Indicators. World Bank Data, Retrieved from http://databank.worldbank.org/data/reports; http://databank.worldbank.org/data/views/reports/ReportWidgetCustom.aspx? Report_Name=Table-1-SDDS-new&Id=4f2f0c86.

has come to be the central issue of international politics (Graeber, 2011).

Debt crises in Mexico in the early 90s of the last century, in the countries of Southeast Asia in 1997, in Russia in 1998, and in the Latin America countries at the turn of the twentieth and twenty-first

centuries, a significant recent increase of external debt of the US and some African countries, as well as the ongoing debt crisis in the euro area have put the problem of the rapid growth of external debt in the center of the most urgent global financial and economic problems, requiring an efficient solution (Debt. 13th BIS Annual Conference, 2015).

In the 80–90-s of XX century, sovereign debt crises were initially associated with the developing countries only, but at present, an urgent problem is the developed countries' debts. In recent years, the volume of external debt of the most major countries around the world has been steadily increasing. The massive increase in public borrowing in many advanced economies raises questions about the sustainability of public debt (Dembiermont, Scatigna, Szemere et al., 2015).

Table 3 shows the evolution of the amount of the gross external debt (public and private) of the top ten countries of the world leading regarding the value amount.

The table shows that in 11 years the amount of the gross external debt of the top ten countries has increased by almost 1.8 times (from US$ 30 tn. in 2005 to US$ 53 tn. in 2016). Among the top five countries, a minimum growth was in the UK (1.2 times), while the maximum was in the United States (2.1 times). In the case of the government sector, credit booms may affect the incentives of different interest groups to agree on policies for reform or fiscal stabilisation (Santos, 2015).

After the global financial and economic crisis of 2008–2009 among the top five countries, the volume of gross external debt has reduced in all countries except the United States. In the USA there was an increase of almost 30 per cent. However, as can be seen from Table 4, the external debt in 2016 increased in 9 out of 10 countries (excluding the UK). Active issuance by governments and non-financial corporations has lifted the share of domestically issued bonds, whereas more restrained activity by financial institutions has held back international issuance (Gruić, Schrimpf, 2014).

Please note a very high degree of concentration of the global gross external debt among the major developed countries of the world. The top ten countries account for about 87 per cent of the global gross external debt, and the top five countries account for 2/3.

If to take into account the sovereign external debt only, then the top ten countries leading regarding

Table 5
The amount of public external debt, III quarter 2016

Country	US$ millions	% of gross external debt
USA	6288511 (II sq. 2016)	34.4
France	1566250	28.7
Germany	1466711	27.5
Japan	1225693	33.6
Italy	932095	39.0
United Kingdom	804979	10.0
Spain	626857	29.7
Canada	347729	19.9
Greece	297130	61.5
Netherlands	245179	5.9

Source: calculated by the author by World Development Indicators. World Bank Data, Retrieved from http://databank.worldbank.org/data/reports; http://databank.worldbank.org/data/views/reports/ReportWidgetCustom.aspx? Report_Name=Table-1-SDDS-new&Id=4f2f0c86.

the value amount of the external debt, in 2016 were as follows (see Table 5).

As the table shows, the share of public debt in the gross external debt of the top ten countries also strongly differs from 5.9 per cent in the Netherlands to 61.5 per cent in Greece.

The major debtor in the world is now the USA. According to the World Bank, at the beginning of 2015 the value of US external debt, reaching 22 per cent of world GDP, was more than three times higher than the gross external debt of 124 developing countries and countries with economies in transition and made more than 1/4 of the world's external debt. In the structure of the US external debt, the sovereign debt accounts for about 1/3.

As for the leading European countries, on the one hand, they are the largest lenders in the world and, on the other hand, have a large enough amount of own external debt, and the amount of that debt has been increasing in recent years, both in absolute terms and in relation to GDP. At the beginning of 2016, according to the World Bank data, the gross external debt of the Eurozone countries amounted to US$ 15.1 tn. 3/4 of it was in the external corporate debt. Apart from Greece, Cyprus and Portugal, where the debt crisis was very heavy, in Italy, Spain,

Belgium and Ireland, there is quite a problematic situation with the external debt. And even such leaders of the eurozone as Germany and France were forced to increase the size of the external debt, to raise the necessary funds quickly and to support banks and companies in the midst of the global financial and economic crisis of 2008–2009.

Table 6 shows the structure of the sovereign external debt of the top ten countries leading regarding the value amount of the external debt.

The table above shows that in the structure of the sovereign external debt long-term debt obligations dominate, accounting on average for 87.2 per cent. The only exception is Japan, where the share of the long-term debt obligations accounts for just over half of the sovereign external debt. The dominance of the short-term debt obligations is considered undesirable for the country because it requires the reservation of a large amount of money to repay the external debt in the coming months or prompt refinancing of external debt in the current market conditions that may be unfavourable for the borrower.

In the structure of the long-term debt obligations, debt securities account for around 86 per cent. Exceptions are Spain, where the ratio between debt securities and loans is 3:1, and especially Greece, where more than 4/5 of the sovereign foreign debt falls not on debt securities, but various types of loans. In general, the dominance of debt securities in the structure of the sovereign external debt of the developed countries reflects the current market trend of sovereign external debt development. It is connected with a decrease in the proportion of different types of loans as illiquid instruments of debt financing and a corresponding increase in the share of sovereign debt securities that can be freely traded in the international stock market.

Developed countries try to regulate the growth of external debt by setting certain limits. For example, in the EU the maximum amount of sovereign debt (including external and internal) should not exceed 60 per cent of GDP. However, in spite of the limit, in the Eurozone, according to the Eurostat, the figure was an average of 90.8 per cent in early 2016, and the EU — 85.3 per cent. More than half of EU countries have the amount of sovereign debt exceeding 60 per cent of GDP. The particularly critical situation is in Greece that in the summer of 2015 was on the verge of sovereign default on external obligations to the ECB and the IMF. Only hard conditions of the

Table 6
The structure of the external sovereign debt, 01.01.2015

Country	The share of the long-term debt obligations, %	The share of debt securities in the long-term debt obligations, %
USA	89.2	97.4
Germany	93.5	94.1
France	86.8	96.0
Italy	91.3	94.7
Japan	51.2	96.0
United Kingdom	93.3	96.3
Spain	88.3	76.9
Greece	98.8	13.7
Canada	88.3	97.1
Netherlands	91.1	94.5

Source: calculated by the author by World Development Indicators. World Bank Data, Retrieved from http://databank. worldbank.org/data/reports; http://databank.worldbank. org/data/views/reports/ReportWidgetCustom.aspx? Report_ Name=Table-1-SDDS-new&Id=4f2f0c86.

state budget stabilization coordinated with external lenders, including, inter alia, raising the retirement age and increase in taxation, made it possible for Greece to receive the first tranches of the external loans within the framework of the new (the third) package of financial assistance in amount of 86 bln. Euros.

Although the share of gross external debt of developing countries is less than 10 per cent of the global external debt, the pace of its growth over the past ten years (on average 11–12 per cent yearly) make the international financial and credit organisations worried about it. Table 7 reflects the dynamics of the external debt and the basic ratios of the debt sustainability of the developing countries and countries with economies in transition.

The table shows that for eight years, the gross external debt has increased by 2.34 times. The specific feature of the developing countries and countries with economies in transition is a large share the public external debt. The external corporate debt accounts for only 1/3 of the gross external debt amount. It is because international investors do

Table 7

Dynamics of the external debt and the main ratios of the debt sustainability of the developing countries and countries with economies in transition

Index	01.01.2006	01.01.2010	01.01.2011	01.01.2012	01.01.2013	01.01.2014
Gross external debt, US$ bln.	2352.0	3629.6	4109.4	4571.5	5032.0	5506.3
Corporate external debt, US$ bln.	567.2	1264.9	1348.1	1556.0	1716.9	1898.1
External debt/GDP, %	27.0	24.1	22.5	21.7	22.5	23.2
Payments on external debt/ Exports, %	13.8	12.7	11.1	10.3	10.0	10.5
Short-term debt/ Gross external debt, %	20.5	21.4	25.3	26.7	26.7	27.8
International reserves/External debt, %	73.9	117.8	120.5	118.7	112.9	111.3
External debt/ Exports, %	80.9	85.4	77.5	71.3	74.5	79.0

Source: calculated by the author by World Development Indicators. World Bank Data, Retrieved from http://databank.worldbank.org/data/reports; http://databank.worldbank.org/data/views/reports/ReportWidgetCustom.aspx? Report_Name=Table-1-SDDS-new&Id=4f2f0c86.

not trust banks and companies from developing countries, preferring to deal with public debt. Please note, however, that the share of the external corporate debt tends to increase (for example, at the beginning of 2006 it accounted for the only ¼ of the gross external debt of the developing countries. The average level of the ratio "external debt/GDP" (23 per cent) indicates a relatively low external debt risk of the developing countries. However, this figure strongly differs by separate countries (for instance, in China — 9.5 per cent, and in Hungary — 170.8 per cent). The same is true with a ratio "international reserves/external debt". Over the past five years, on average it is equal to 116 per cent. However, in China, the figure was 439.1 per cent, and in Ukraine — 12.7 per cent.

The analysis of the regional structure of external debt and the main ratios of the debt sustainability in developing countries and countries with economies in transition makes it possible to conclude that there are significant differences between separate regions. For example, European, East Asian and Latin American countries account for 80 per cent of the gross external debt of the developing countries, and the remaining 20 per cent is divided between Africa, the Middle East and South Asia (Table 8).

The highest debt burden falls on European countries. Also, the European countries have the lowest ratio "international reserves/external debt" and the highest ratio "external debt/exports". In East Asia, the highest ratio is "international reserves/external debt" (primarily due to the huge size of China's international reserves). However, in the structure of the external debt of the East Asian countries, almost 52 per cent is short-term debt that increases the risk of refinancing of external debt of these countries as a result of adverse changes in the current situation in the international debt market.

The specific feature of the developing countries and countries with economies in transition, as well as of the developed countries, is a high degree of concentration of the external debt. The top ten countries account for almost 2/3 of the total external debt of the developing countries.

Methods of External Debt Settlement

In the history, the events of default of the developing countries on external debt took place many

Table 8

Regional structure of the external debt and the main ratios of the debt sustainability of the developing countries and countries with economies in transition, early in 2014

Index	Europe and Central Asia	East Asia and the Pacific	Latin America and the Caribbean	The Middle East and North Africa	South Asia	Sub-Saharan Africa
Gross external debt, US$ bln.	1234.2	1672.9	1495.4	190.5	545.7	367.5
External debt/ GDP, %	63.9	14.8	27.4	17.3	23.2	24.3
Payments on external debt/ Exports, %	39.6	3.3	16.5	4.9	9.4	6.3
Short-term debt/ Gross external debt, %	21.3	51.6	14.8	17.9	17.7	14.7
International reserves/External debt, %	25.5	259.7	48.8	152.0	58.4	36.6
External debt/ Exports, %	153.4	46.8	127.2	55.2	96.5	78.5

Source: calculated by the author by World Development Indicators. World Bank Data, Retrieved from http://databank. worldbank.org/data/reports; http://databank.worldbank.org/data/views/reports/ReportWidgetCustom.aspx? Report_ Name=Table-1-SDDS-new&Id=4f2f0c86.

times, and international lenders currently have a certain set of earlier tested methods and tools to settle external debt problems. For a long time, the main form of the debt settlement was a delay of payments. On the one hand, as a result of the achieved delay the country in debt received some breathing space, but on the other hand, in this case, the total debt burden increased due to the accrual of additional interest and it greatly complicated the solution of the problem of sovereign external debt of the country.

In this respect, the lending states together with the borrowing states and international financial and credit institutions (primarily the IMF) began to develop various options for restructuring sovereign external debt to reduce the total amount of the debt of the borrowing countries. Sovereign debt restructurings have returned as a key concern to governments and market participants (Das, Papaioannou, Trebesch, 2012). The restructuring of the intergovernmental foreign loans is carried out by the Paris Club. The Paris Club member countries have produced a coordinated policy of the inter-state settlement of the external debt. Depending on the level

of welfare of the borrowing countries (based on the level of income per capita) a long-term restructuring of the external debt (for a period of 10 to 40 years) is carried out with the possibility of a partial write-off (90 per cent of the outstanding debt).

In addition to debt restructuring, sovereign borrowers use various financial techniques to reduce the external debt burden. One of them is the repurchase of debt at a discount in the international debt securities market. The borrowing country should buy back its debt in the market if it is traded at a large discount.

In the last 25–30 years, new forms of settlement of the external sovereign debt have appeared in the market. One of them is a conversion of external debt in a certain type of assets held by the borrowing country. The most popular type of conversion was the exchange of debt for shares of the national companies. Along with the shares the external debt can be converted into debt denominated in the national currency, in exported goods and other national assets.

Another form of settlement of the sovereign external debt is securitisation. It means issuing sovereign debt securities to replace the existing

ones or instead of non-issue debt obligations of the borrowing country. The securitisation of external debt was used in the Eurozone for the settlement of the situation in Greece during the hard debt crisis. In 2012, the private creditors agreed to write off more than half of the nominal value of outstanding debt securities of Greece, and instead, several tranches of new sovereign bonds with maturities between 11 and 30 years and with different coupon rates were issued. All kinds of newly issued debt securities allowed Greece to securitise its debt obligations amounting to over 200 billion euro.

The Problem of External Debt Management

An aggravation of the problem of the globalisation of the external debt prevents the restoration of stability and achieving sustainable growth in the current global economy. Until significant pockets of private, external and public debt overhang further abate, the potential role of other headwinds to economic growth will be difficult to quantify (Lo, Rogoff, 2015). In this regard, at present various countries and groups of countries strengthen management of external borrowings at the national and regional levels. The critical point appears to be the institutions set up to handle potential problems, and these institutions are part of the question of distinguishing between what is a good sovereign and what is not (Flandreau, 2013).

National regulators from different countries began to actively collaborate to create a common international approach to financial supervision. The starting point was the G20 summit in Washington in 2008. From that moment, the attempts are made to reform the regulation of the international financial market in general and the international debt market in particular. New changes in regulation are primarily aimed at enhancing the transparency of financial transactions and increasing market efficiency.

Along with the control of sovereign debt at the international level, efforts are being made at the regional level too. For example, to address the sovereign debt problems of the euro area in June 2010 on a temporary basis an interstate regional body — the European Financial Stability Facility (EFSF) — was established in Luxembourg. It provided prompt financial assistance to Ireland, Portugal and Greece have issued bonds and other debt instruments in the international financial market under the sovereign guarantees of the Eurozone countries.

In October 2012 in Luxembourg, the European Stability Mechanism (ESM) started to operate. It was established as a permanent body to replace the EFSF to fulfil its functions. Both organisations have existed in parallel until June 2013, using common staff and common offices. On 1 July 2013, the EFSF finished participation in any new financial aid programs and was dealing with servicing and repayment of its debt obligations only.

At the national level regulation of sovereign debt can be carried out by various national institutions: ministry of finance, the central bank, as well as specialised organisations. In connection with the aggravation of the problem of the external debt growth in 90-s last century, various countries established specialised debt management offices. These offices were created either as separate and independent entities, either as a division of the national central bank or ministry of finance.

These organisations manage the public debt of the country as a whole, including both external and internal debt. Management of internal and external debt of the country from one central location makes it possible to minimise the cost of various types of loans. Under favourable market conditions, a specialised agency can quickly replace an expensive debt for a cheaper one, as well as to switch from external to domestic borrowing, and vice versa. Successful debt management requires close collaboration between different elements of the government concerned with external finance to have the key information necessary to make informed decisions on the access to and uses of external finance (Klein, 1994).

In addition, in a globalized world economy a division of the public debt into the external and internal is rather conditional, since in the government's debt structure of various countries of the world the share of market debt instruments is increasing in the form of a variety of debt securities that are publicly traded (Gruić, Wooldridge, 2012). In this regard, the sovereign debt securities repeatedly change the holders, and the holders may be both non-residents and residents. Besides that, the sovereign debt securities intended to be placed in the internal national markets, as a rule, can be purchased both by residents and non-residents, as well as the sovereign debt securities intended to be placed in the foreign market. The market practice shows that the final beneficiaries of the non-resident company can be individuals who are residents of the borrowing country, and the

final beneficiaries of the resident company can be non-residents.

As a part of the national regulation of sovereign debt, one of the main activities of the state authorities is to determine the limits of the new external borrowings. To control the growth of sovereign debt, it is important that the annual volume of new external borrowings does not exceed the amount of the annual payments on the current basic external debt. In practice, however, this ratio is not always observed in different countries, especially in a favourable situation in the international debt market. A more restrictive, practical, solvency criterion suggests that the debt to GDP ratio (or the ratio of debt to some other measure of the capacity to pay such as exports or government revenue) should not increase forever (Roubini, 2001).

The aim national regulation of sovereign debt is the formation of the optimal structure of the external debt. First of all, it concerns the maturity structure of external borrowings. The optimal strategy for sovereign debt is to avoid future payment peaks.

To comply with the safe level of the gross external debt, national regulators apply special measures in relation to national financial and non-financial institutions. For example, the central bank may introduce a mandatory norm that fixes the maximum size of debt obligations of the national commercial banks to the non-resident creditors. Likewise, the appropriate figures fixing external borrowings of financial organisations at an economically safe level (especially with a high equity proportion of the state) may be used.

Probably, shortly consolidation of efforts of international financial organisations and national authorities monitoring domestic financial markets, in the area of regulating transactions in the international debt market and tightening control over the external borrowings will continue. This may result in implementation of new methods and external borrowing management instruments at the international, regional and national levels, as well as the formation of new, more stringent regulations, standards and rules in the international debt market, as a result of the response of the participants to the demands of the official regulatory bodies in relation to the need to strengthen control in order to prevent a new global financial and economic crisis.

The rapid growth of the external debt burden of many countries (primarily developed countries) raises serious concerns regarding the possibility of a new wave of global financial and economic crisis that can be triggered by a "chain reaction" of debt crises in separate countries. In the current financial and economic circumstances, many countries do not have a real ability to repay its debt and have to borrow more to maintain the existing amount of debt further. The aggregate debt service burden is an important link between financial and real developments; it has sizable negative effects on credit and expenditure growth (Juselius, Drehmann, 2015).

To solve the global debt problem, it is necessary that the main borrowing countries minimise the amount of new borrowings and provide the greatest possible growth of the national GDP. However, in practice, in the current global financial and economic situation, GDP growth is closely connected with the need for additional public spending that requires raising new funds and, as a consequence, increasing the size of the existing external debt.

The globalisation of the external debt problem has a wider sense than just a purely economic problem. It has a direct impact on the nature of the policy pursued by the borrowing countries. The growth of external debt makes the country more dependent on the major international lenders, as well as increasing the likelihood of non-payment in due time and, as a consequence, the failure to meet current financial obligations and the government inability to obtain new loans in the future from non-residents.

Is it Possible to Predict the Sovereign External Debt Default?

The question arises whether it is possible with a high degree of certainty to predict the sovereign default, based on some specific indicators or some sort of aggregate (or resulting) rate? Currently, there are two main methods of estimating the probability of sovereign default in the world: vector method and scalar method. The first method relates to determining the system of indicators, each of which is a kind of indicator of debt. The higher this figure is, the lower a country's ability to service its debt is, and, consequently, the higher the probability of sovereign default is. In the international practice, the most widely used debt indicators are such as external debt to annual GDP (critical level is 50 per cent); external debt to annual exports (critical level is 275 per cent); repayment and external debt service to annual exports (critical level is 30 per cent); external debt service to annual exports (critical level is 20

per cent); GDP per capita (critical level is US$ 785 per year); and a number of other indicators. By the vector method, if these debt indicators exceed specified critical levels, then external debt policy is ineffective, and the probability of sovereign default is quite high.

In October 2012 in Luxembourg, the European Stability Mechanism (ESM) started to operate. It was established as a permanent body to replace the EFSF to fulfil its functions. Both organisations have existed in parallel until June 2013, using common staff and common offices. On 1 July 2013, the EFSF finished participation in any new financial aid programs and was dealing with servicing and repayment of its debt obligations only.

It is not so simple assessing of the probability of the sovereign default by the vector method, despite the visible simplicity of its essence. It is so because according to a number of some external debt indicators a country may exceed the critical level, but according to some others — no. In this case, there appears uncertainty that we cannot eliminate using this method. Furthermore, the critical levels of the external debt indicators are determined by the experts by common sense and empirical observations. All this creates big problems in estimating the probability of a sovereign default of a country. C. Reinhart and K. Rogoff (2009) present data on sovereign external debt defaults for the period from 1970 to 2008. They showed that only 16 per cent of the external debt exceeded 100 per cent of GDP of the country, more than half of defaults occurred when the debt level was below 60 per cent of GDP, and external debt defaults with a level less than 40 per cent of GDP account for almost 20 per cent of the total sovereign external debt defaults.

The scalar method is connected with an integrated assessment when many external debt indicators at the final stage of the analysis are summarised in the final assessment using various aggregation methods. However, as a rule, obtaining an integrated assessment is based not on real aggregating of the initial information but some basic statistical elements translated to an integrated probability of the sovereign debt default by a specific procedure. The scalar method is based on actuarial calculations (that is the assessment of the probability of default based on available statistical data on sovereign defaults) and calculations based on the market value of various financial assets (shares, bonds or derivatives). These calculations are used to determine the cur-

rent risk premium for investors and to predict the probability of the sovereign default.

However, calculations based on the market value of financial assets are more popular. In this case, the main market indicator of the sovereign default probability is a credit default swap. On the basis of the value of swaps covering the risk of default on government debt securities, we can estimate the probability of sovereign default. However, as CDS is widely used a market instrument for speculative purposes, its cost is quite volatile (especially in periods of instability in the world economy and global finance), and may not reflect the fundamental financial and economic indicators of the country. Also, CDS are focused only on sovereign euro bonds, while the estimation of the probability of sovereign default should take into consideration all external debt obligations of the country.

One way to assess the probability of sovereign default could also be sovereign credit ratings assigned by the various rating agencies (especially the "big three" international rating agencies). In this case, however, it should be borne in mind that sovereign credit ratings reflect personal opinions of experts from the rating agencies based, according to the rating agencies, on an independent analysis of the available information. Also, each rating agency uses its original method of evaluation of existing sovereign credit risk. Therefore, sovereign credit ratings assigned by different rating agencies can vary greatly by country.

Along with the methods mentioned above of evaluating the probability of sovereign defaults, alternative "technical" methods based on the use of historical data on sovereign debt default are also developing. One such method is proposed, for example, by E. Balatsky (2016). He describes a method of "restoring" the default function by historical external debt indicators of the countries that had faced default, in the year of sovereign default. The essence of the method is as follows. To identify a small number of key external debt indicators; to collect the numerical values of these indicators for a small group of countries that had faced sovereign default, in the year of default; to choose the specification of the function of the sovereign default probability and to assess the parameters of the function using a simple interpolation.

The author chose three external debt parameters ("external public debt/GDP", "GDP/export" and "GDP/international reserves"), assuming that

the size of external public debt of the country, the value of its export operations and the amount of its accumulated international reserves are the main factors determining sovereign default. For analysis three Latin American countries (Ecuador, Argentina and Mexico) were selected, as well as two Asian countries (Thailand and South Korea) and Russia, which, according to the author, with a certain degree of conditionality can be attributed to the category of the Asian countries and was affected by the Asian crisis of 1997–1998.

As a result of the econometric analysis, the author concluded that if for Latin America the weight of debt was the critical factor, then for Asia in the first place was the export factor. Thus, countries in the appropriate regions existed under the very different models of sovereign default. In Latin American countries the problem of sovereign default was mainly caused by excessive borrowing, and in Asia and Russia debt problems were connected with the deterioration of the foreign trade situation. Therefore, the author highlights the regional default patterns that are different in the nature of origin and development. Latin American model of default can be conditionally named a debt model, and Asian model is a trade model.

Based on the study of elasticity of the probability of sovereign default depending on certain factors (for example, the volume of external debt), the author notes that each regional group of countries has significant national peculiarities regarding causes of sovereign default. For example, in Ecuador, it was a huge external debt, in Argentina — a fall in export earnings, in Mexico — a reduction of international reserves. Therefore, within the framework of a debt default model completely different aspects of the economic life of the country were limiting factors. Quite a different result was in Asia where a uniform model of default was seen — in all three states a trigger was the deterioration of the situation in the foreign markets. According to the author, in the debt model errors in borrowing have led to the excessive demands in respect of export activities and reserves,

while in the trade model a lack of export revenues triggers an increase of external debt and a reduction of international reserves. The "bottleneck" can be any of these three factors, depending on the configuration of the resources of the national economy. Not all crises are equal: they differ depending on whether the government faces insolvency, illiquidity, or various macroeconomic risks (Manasse, Roubini, 2009).

Another conclusion is that different groups of countries have quite different, sometimes disparate, vulnerability to default. This fact means that we should rethink the term "sovereign default". Although it regards a particular country, however, in the context of the world events which may differ substantially in various periods. For example, during the Asian crisis defaults in different countries took place in a much more secure environment than in Latin America. Therefore, it is impossible to apply «default standards» of some groups of countries to the other groups. In other words, a wrong diagnosis of a problem is a bad starting point for remedies (Holmstrom, 2015).

Summary

Concluding the above mentioned, we should say that at present it is quite obvious that not just separate countries have significant debts as it was, for example, 30–35 years ago, but most of the world. The new realities are connected with large-scale debt obligations of many countries that have a significant impact on the formation of current global economic landscape and global financial architecture, as well as on the nature of relationships between the countries.

A problem to refinance external debt as a result of the refusal of creditors to provide new loans forces governments of the borrowing countries to cut public expenditures and can provoke serious social upheavals. As a result, the aggravation of the global external debt problem may become one of the main triggers of a deep financial and economic crisis not only in separate countries or a group of related countries but on a global scale.

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Проблема внешнего долга и мировая финансовая архитектура

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Аннотация. Либерализация мирового финансового рынка в 90-е гг. прошлого века и в начале XXI в. привела к усилению зависимости многих стран (как развитых, так и развивающихся) от внешнего финансирования и существенному росту суверенного внешнего долга, что создало реальную угрозу для стабильного развития мировой экономики. В статье рассматривается проблема растущего внешнего долга многих стран мира, анализируются методы решения данной проблемы и управления внешним долгом со стороны государственных органов. Особое внимание уделяется проблеме прогнозирования вероятности суверенного дефолта по внешнему долгу. В статье содержится вывод о том, что обострение проблемы глобального внешнего долга может стать одной из главных причин глубокого финансово-экономического кризиса не только в отдельных странах или группе связанных между собой стран, но и в глобальном масштабе.

Ключевые слова: внешний долг; долговые ценные бумаги; дефолт; критерии платежеспособности; регулирование внешних заимствований

JEL Classification: F34

The Principles of Global Economic of Aggression

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Abstract

To characterise the studied economic wars and aggression, the author of this article uses the prefix "global", not "geo". There are at least three reasons for that. First, an economy, but not the territory or political system, is the direct goal of aggression. Second, aggression is carried out regardless of the territorial location of its victim, and aggression, as a rule, is carried out by several entities. That is, it has a global character. Third, the term "geo-economic aggression" is already used to refer to the theory of a new geopolitical struggle. The word "aggression" in the title of this paper it is used in the article because those wars are declared, but global-economic acts are usually committed secretly. Global-economic wars and aggressions have been waged for centuries, and there is no reason to expect them to end soon. For this reason, it is useful to know the explicit and implicit principles, which their initiators and organisers are guided. Ten principles of global economic war and aggression are discussed in this article.

Keywords: principles; aggression; indirect approach; destruction of the economy; strategy; USSR; Russian Federation

JEL classification: F49, F51, H56

Funding

My studies of the different cases of global economic aggression, carried out against the Soviet Union and the Russian Federation, showed that attackers often use specific technologies of struggle, named by the known English military theorist and historian Sir Basil Henry Liddell Hart (1985–1970) "an indirect approach" (Liddell Hart, 2008). The Secretary of the Security Council Nicolay P. Patrushev also pointed to the typical use of such an indirect approach in the fight of some states for their interests in the modern world (Patrushev N., 2015). The revealed patterns of indirect actions application can be formulated in the form of principles, by which the aggressor is guided in its actions. Let's discuss their top ten.

Principle 1. The enemy cannot be defeated (to achieve their political, ideological, economic, etc. goals, to seize territory, resources) with the help of military force, and it is extremely impractical to use it.

Already three years after the end of the Second World War, skilled strategists of the United States was aware of the impossibility of an armed seizure and military control over the Soviet Union and clearly stated this in the secret National Security Council directive 20/1, August 18, 1948 "U.S. Objectives with Respect to Russia»:

«In the first place we must assume that it will not be profitable or practically feasible for us to occupy and take under our military administration the entire territory of the Soviet Union. This course is inhibited by the size of that territory, by the number of its inhabitants, by the differences of language and custom which separate its inhabitants from ourselves, and by the improbability that we would find any adequate apparatus of local authority through which we

could work» (Etzold, Thomas H. & John Lewis Gaddis, 1948).

In may 2018, the Swedish newspaper Svenska Dagbladet vividly described the nightmare awaiting the military, who suddenly wish to capture Russia, Switzerland and New Zealand[1]. On August 14, 2018, the portal of veterans of the American army, members of military families and fans of military history collectively named "We Are The Mighty" published material with an eloquent title: "The 5 countries that are most impossible to conquer"[2]. The five invincible in order of location on this electronic resource included: USA, Russia, Afghanistan, China and India.

If the country cannot be conquered by military force, other approaches, methods and means should be tried. It turned out that in peacetime, you can attach to itself part of the territory of another state. Thus, in 1979, the United States began and in July 1999 completed the transfer of Panama Canal facilities and management. On the night of 1 to July 2, 1997, after a 99-year lease by the United Kingdom, Hong Kong was officially transferred to the jurisdiction of the People's Republic of China. On 20 December 1999, Portugal transferred Macao to the jurisdiction of the PRC.

But the Russian Federation in peacetime lost part of its territory, which was acquired by the United States, the People's Republic of China, and the Kingdom of Norway (Table 1).

Principle 2. To succeed in achieving already set goals, it is desirable to be stronger than the enemy.

Naturally, in the global economic struggle with the USSR, which began soon after the end of World War II, the United States of America proceeded primarily from military force.

"One of the most important ingredients of power is military strength... Without superior aggregate military strength, in being and readily mobilizable, a policy of "containment" — which is in effect a policy of calculated and gradual coercion — is no more than a policy of bluff" — is

written in the National Security Council Report to the President Pursuant to the President's Directive of January 31, 1950 "United States Objectives and Programs for National Security"[3].

Over time, significant importance is given to the economic, ideological, cultural, information, and propaganda strength. And introducing in March 2017 anti-Russian sanctions, the USA with a group of countries that supported them, were economically ten times stronger than the Russian Federation. By 2018, their economic strength was even greater (Table 2, Figure 1, Table 3).

Principle 3. The means of influence used, the measures taken and the actions taken must be within the means that the entity using them (the state, the company, the Corporation and (or) their groups and unions) can allocate to this.

Giving their recommendations, the authors of the report to the President under the President's Directive of January 31, 1950, NSC 68: United States Objectives and Programs for National Security"[4] (April 14, 1950), described actions, which will be cheaper and more effective.

However, being stronger automatically means that an equal response to the attacker will cause less damage to the attacker than the damage to the victim of aggression. Thus, if all states that have imposed anti-Russian sanctions direct 0.001 per cent of their gross domestic product (damage — 0.001 per cent of their GDP) to their implementation, for example, in 2017, and Russia's so-called symmetrical response measures are also equal to 0.001 per cent of their GDP, the total losses of the aggressor countries will amount to 0.002 per cent of their total gross domestic product. In 2017, it is 91.8 billion of the US dollars. While only the response of the Russian Federation in the amount of 0.001 per cent of the total GDP of these countries will be 3.0 per cent of its GDP. Plus the damage caused by the sanctions of the aggressor states.

It is as if two people were competing in how much time they will raise the bar of 100 kg while one person weight is 100 kg and of the other one 240 kg. Ceteris paribus, both healthy, trained and motivated to win, will win more than a heavy

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Table 1
Territories lost by Russia in 1990–2011.

Year	Territory
1990	June 1 in Washington, the Minister of Foreign Affairs of the USSR Eduard Shevardnadze and the 61st United States Secretary of State James Addison Baker III signed an agreement on the delimitation of Maritime spaces in the Bering and the Chukchi seas. The Resolution of the State Duma of the Federal Assembly of the Russian Federation No. 2880-III SD (adopted in June 14, 2002) says about this agreement: "As a result of the delimitation of Maritime spaces in accordance with the Agreement in the Bering sea the following territories went to the USA: a part of the exclusive economic zone of the USSR with an area of 23.7 thousand sq km, actually transferred by the Soviet Union to the United States of America in 1977; a part of the exclusive economic zone of the USSR with an area of 7.7 thousand sq km; section of the continental shelf with an area of 46.3thousand sq km in the open central part of the Bering Sea, located outside 200 nautical miles from the baselines. At the same time, the section of the continental shelf that has departed in this part of the Bering Sea to the Russian Federation counted for only 4.6 thousand sq. km. On a separate area, the exclusive economic zone of the United States of America due to the unjustifiably ceded area of the exclusive economic zone of the USSR exceeded the distance of 200 nautical miles from the baselines. It is contrary to article 57 of the United Nations Convention on the law of the sea (1982)". The Supreme Soviet of the USSR, and later the State Duma and the Federation Council of the Russian Federation have not ratified this document, rejecting it as infringing on Russia's national interests. The agreement was ratified by the U.S. Congress on September 16, 1991, and the US considers this territory to be its own.
1991– 1992	On May 16, 1991, the parties signed in Moscow the "Agreement between the Union of Soviet Socialist Republics and the People's Republic of China on the Soviet-Chinese state border on its Eastern part". The text finally confirmed that the boundary was drawn along the waterway of navigable rivers and in the middle of non-navigable rivers, plus the parties established a demarcation Commission. The agreement was ratified by the Russian Supreme Council in February 1992 and came into force on 16 March. Damansky and Kirkinskiy islands went to China officially.
2004– 2005	On October 14, 2004, Russian President Vladimir Putin and Chinese President Hú Jĭntāo signed an "Additional agreement on the Russian-Chinese state border on its Eastern part", according to which the PRC transferred the Tarabar Islands and part of the Great Ussuri island. On May 20, 2005, the State Duma of the 4th Convocation ratified this agreement (307 deputies supported, 80 against, two abstained). On May 25, 2005, the agreement was approved by the Federation Council (supported by 157 senators, against-two, without abstention). On July 21, Foreign Minister Sergey Lavrov and his Chinese counterpart Yang Jiechi signed in Beijing a Protocol-description of the Russian-Chinese state borderline in the Eastern part of the Russian Federation. On December 1, 2005, Russia officially handed over the Islands of Tarabarov and a part of the Great Ussuri island to China. The Great Island on the Argun River in the Chita region (now it is the Zabaikalsky Krai) also departed to China. A total of 337 sq. km.
2010– 2011	15 September 2010 in Murmansk, Russian President Dmitry Medvedev and the Prime Minister of Norway Jens Stoltenberg signed the agreement «Treaty between the Russian Federation and the Kingdom of Norway on Maritime delimitation and cooperation in the Barents Sea and the Arctic ocean». The Treaty narrowed the area covered by the sovereign rights of the Russian Federation. The Treaty was ratified by Federal law of the Russian Federation from April 5, 2011 No. 57-FZ «On ratification of the Treaty between the Russian Federation and the Kingdom of Norway on Maritime delimitation and cooperation in the Barents Sea and the Arctic ocean». According to L.I. Kalashnikov, Norway received 90 thousand sq km of water area with the richest deposits of oil, gas and fish resources

lifter. In general, their state of health, the degree of training and level of motivation can be different. In the case of countries, this means inequality in the size of their populations, their age and sex composition, the level of health and education of their inhabitants, the qualifications of workers, the development of their economies, science, technique and technology, culture, traditions and ideology, and their moral and psychological state. The nature and effectiveness of economic and social management are also different.

What to do? Do not answer? However, unilateral concessions and requests will strengthen the attacker's confidence in his strength and impunity, and will not give impetus to the rejection of aggressive actions. The aggressor must be subjected to unacceptable harm to stop the hostilities. And here the symmetric measures for disciplining a stronger opponent is not enough. His damage, as shown in the above example, will be less than the victim of aggression. Therefore, the exhaustion of the victim will come earlier than the aggressor.

The answer should be asymmetric, not equal to the blow inflicted on you and not a mirror. It means that the adversary will be better to hit his weak points, and they are likely to be different from your pain points, which hit the enemy. Weaknesses and pressure points are present in every living creature, in any state, vulnerable, and technical systems.

Irreparable damage is incompatible with our fourth principle of global economic aggression and can stop the aggressor.

Principle 4. The implementation of the developed actions should not cause damage to their initiators (the state, companies, corporations, etc.), the more irreparable.

Global economic aggression is carried out in the hope of obtaining the desired results, the best situation for the aggressor. To achieve the goals, the desired results usually have to sacrifice something, incur losses, produce costs. To fight, to wage war, to resist makes sense when the results are valued above the cost. At the same time, costs and results do not necessarily have the same units of measurement — physically, monetary, labour, human, etc. Not always, and not necessarily, to carry out their physical or mathematical comparison. Human society, its groups and individual members are able and

Table 2

The ratio of GDP of countries that imposed sanctions on Russia to Russia's GDP in 2014 and 2017, in current prices, times

Country	2014	2017
USA	9.4	12.7
Japan	2.5	3.2
Canada	1.0	1.1
EU states that have declared anti-Russian sanctions	9.6	10.9
В том числе:		
Germany	2.1	2.4
Англия и Ирландия	1.6	1.7
France	1.5	1.7
Italy	1.2	1.3
Spain	0.8	0.9
Other countries that have declared sanctions	1.9	2.2
All countries that have declared anti-Russian sanctions	24.4	30.1

Source: author's calculations on the basis of 'Statistics Times'. Retrieved from http://statisticstimes.com/economy/ european-countries-by-gdp.php.

Table 3

Gold reserves in the reserves of the top five countries at the end of March 2018, tons

USA	Germany	Italy	France	Russia
8133.5	3372.2	2451.8	2436.0	1890.8

Source: World Gold Council. Quoted from Gaidaev V., 2018.

know how to juxtapose, compare and evaluate things the incomparable in formal logic and the physical sense. However, the evaluation and comparison criteria are not necessarily the same for all. So, for the sake of freedom and independence, in the name of faith, protection of honour and dignity, people are willing to sacrifice their lives. And the result is the preservation of these values because not abandoning them is above cost.

The result of global economic aggression for its initiators and performers is usually the material, political, economic, territorial, and im-
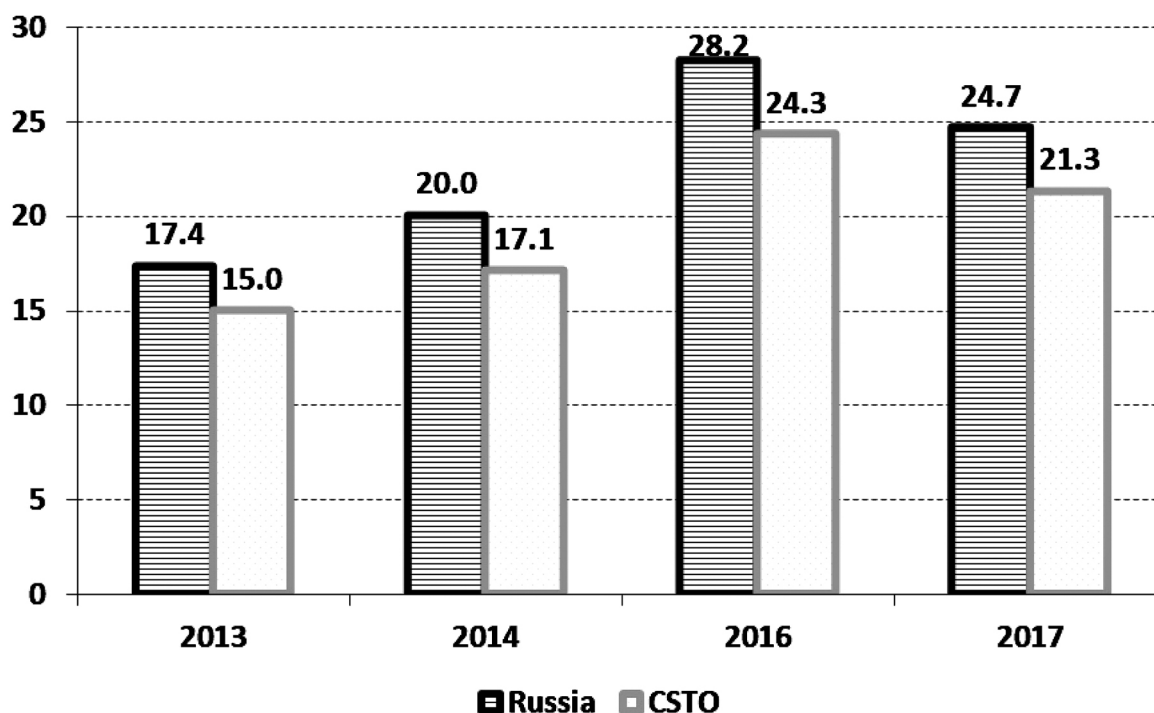
Fig. 1. The ratios of GNP of the member's states of NATO to the GNP of the Russian Federation and the states of the Collective Security Treaty Organization (CSTO), 2013–2017.

Source: author's calculations on the basis of "Statistics Times". Retrieved from http://statisticstimes.com/economy/european-countries-by-gdp.php.

age, benefits. Because of the cost of achieving it, according to Principle 4, it is necessary to minimise, and not to expend their forces before the goals are achieved.

Following this principle, the United States, the European Union and states that have joined their policy of anti-Russian sanctions are trying to harm the Russian Federation' economy, without affecting the most important areas where they make a profit in Russia[5]. So, no restrictions and prohibitions on exports to Russia of foreign software, computers, touch pads, telephones, civil aircraft and automobiles, pharmaceuticals, alcoholic and non-alcoholic beverages, etc.

Principle 5. Do not wait for the immediate receipt of the desired result. It can appear after a long time.

It is clearly fixed in the Records of the National Security Council "U.S. objectives with respect to Russia", August 18, 1948:

"In the first place, there is no time limit for the achievement of our objectives under condi-

tions of peace. We are faced here with no rigid periodicity of war and peace which would enable us to conclude that we must achieve our peacetime objectives by a given date «or else». The objectives of national policy in times of peace should never be regarded in static terms. In so far as they are basic objectives, and worthy ones, they are not apt to be ones capable of complete and finite achievement, like specific military objectives in war. The peacetime objectives of national policy should be thought of rather as lines of direction than as physical goals" (Etzold & Gaddis, 1948).

"The secret plan of President Reagan" was also long-term. He did not expect the early achievement of its strategic goals. Anti-Russian sanctions which are fixed in Countering America's Adversaries Through Sanctions Act are oriented for the long term[6]. The history of the United States of America shows that the Federal and state laws adopted there have not been repealed for centuries. They are amended and supplemented. It gives grounds to believe

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[5] According to Alexis Rodzianko, the President of The American Chamber of Commerce in Russia, «The US sanctions affect areas where trade has previously been small, such as military products» (Spiegel. 2015, June 2).

[6] HR 3364. Countering America's Adversaries through Sanctions Act. (2017). Retrieved from https://www.congress.gov/bill/115th-congress/house-bill/3364/text.

that the statutory global economic actions will be last for a long time.

Principle 6. Simultaneously act (strike, threaten, cause damage, etc.) on several objects (targets).

Basil Liddell Hart wrote in his book "The Strategy of Indirect Approach" published in 1946: "The offensive being waged against a single item, there should be a threat to another point, which, if necessary, should be carried kick… To ensure the capture of one object, it is necessary to create a simultaneous threat to several objects" and "if you create a simultaneous threat to several objects, thereby dissipate the attention of the enemy and force him to disperse the forces" (Liddell Hart, 2008, pp. 279, 425).

When American experts have revealed the highest dependence of the budget of the USSR on the export of energy resources, a strategy was formed to provoke financial and economic bankruptcy of the Soviet state. It provided for two interrelated goals: the organisation of a sharp decline in revenues to the budget of the USSR from foreign trade, combined with a significant increase in the cost of solving problems organised from the outside. For example, the arms race and the Strategic Defense Initiative (SDI), border tensions, information war and social unrest in the allied countries.

Later, the principle of creating threats to several targets was simultaneously used in the anti-Russian sanctions of the USA President Barack Hussein Obama II and some supporting states, and also in Countering America's Adversaries Through Sanctions Act. They provide for the impact on several goals: the credit and financial system of the country, its economy, the military-industrial complex, the welfare of the population, ideology, socio-political situation in the country, the leaders of the state and influential representatives of the business community.

Principle 7. To choose the objects of influence (goals) depending on the time, situation, available opportunities to influence them.

This principle logically follows from the natural change of all living and inanimate in our universe. However, its importance for Russia is small: weaknesses, vulnerabilities and pain points of the country do not change for centuries. This is the desire to adopt everything from the West, a more respectful attitude to foreigners than to their fellow citizens, hope for help from the outside, lagging behind in a number of areas of science, technique and technology, the excessively slow changes of the structure of the country's economy, the insufficiently effective system of economic management, administrative-territorial entities and society, as well as the already mentioned export-raw material model of economic development.

An example of the desire to "learn" from the West, to adopt someone else understanding, as well as excessive credulity, was the involvement of American "experts" in the development of the Constitution of the Russian Federation in 1993, and the inclusion of provisions on the supremacy of international law over Russia's one and the rejection of state ideology.

The last was done despite well-known for centuries for military theorists and practitioners of the exceptional importance of the moral and ideological attitude of troops and population. The importance of the ideological component is demonstrated by the militants of numerous religious terrorist organisations and movements in different parts of our planet[7]. In the modern world, ideological weapons are increasingly being used in the global information and psychological confrontation of ideologies, world understanding, states and various unions, associations and groups[8].

Principle 8. Keep the enemy in the dark about when and what objects (targets) and what means will be struck. Mislead the enemy, make them nervous.

A striking example of the use of this principle is the so-called "Kremlin report" report of the US Treasury Department submitted to the US Congress in January 2018 in pursuance of Countering America's Adversaries Through Sanc-

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[7] Maciej Milczanowski, former consultant to the National Security Bureau of Poland, head of the Institute for National Security Studies at the Graduate School of Informatics and Management in Rzeszow, notes that "religion and ideology are becoming a convenient tool that is used to create conflicts and mobilize societies to participate in them" (Maciej Milczanowski, 2016).

[8] Perhaps the initiative of the Ministry of Defence of the Russian Federation to create the Main Military and Political Directorate of the Russian Armed Forces in February 2018 and its formation in July 2018 will be the first step towards the development and adoption of the state ideology of the Russian Federation.
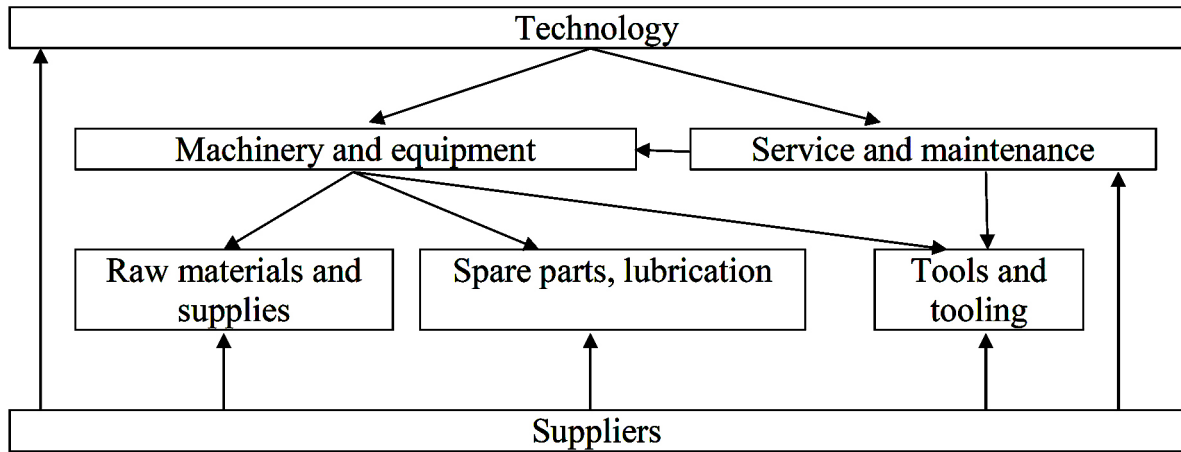
Fig. 2. Links of ingredients of an acquired technology.

tions Act and containing a list of persons, both already under sanctions and those to whom they can still be imposed. It includes employees of the presidential administration, plenipotentiary representatives of the President of the Russian Federation in the Federal districts, members of the government, of the Federation Council and the State Duma, heads of state companies, and the Russian entrepreneurs. Those who have not yet been sanctioned are unaware of when and what prohibitions and restrictions will be imposed on them and their relatives by the leadership of the United States of America.

With regard to the introduction of the enemy in error, then this resort in ancient times (See, for example, Lobov, 2001). So in the treatise, Sun Tzu's "Art of war" (around VI — V centuries BC) read:

"War is a way of deception. So, if you can do something, show the enemy that you cannot; if you enjoy something, show him that you do not use it; if you are very close, show him if you are far away; though you were far away, show him like you are close; reel him in benefits; bring him in frustration and bury him; if he is full of all, be ready; if he is strong, turn away from him; causing in him the anger, bring it into a state of disorder; taking a humble view, call it conceit; if his forces are fresh, weary him; if he is friendly, disconnect them; attack him when he is not ready; perform when he is not waiting" (Sun Tzu).

One of the most important methods of misleading the leaders of a state and its people is to block their awareness of the aggression being carried out against their country. It is largely helped by methods and means of manipulation of public consciousness — huge opportunities to confuse, misinform and keep in the dark, open information technology[9].

Knowing Principle 8, you perceive contradictory expressions and statements of the US President Donald Trump in a completely different way. It is not the features of his character, and direct adherence to Sun Tzu formulated the request to the master war commander:

"Now it is a matter of commander: he must always be calm, and it is impervious to others; he must be very disciplined and to keep the other. He must be able to mislead the eyes and ears of his officers and soldiers and prevent them from knowing anything. He must change his plans and change his plans and prevent others from knowing about them" (Sun Tzu).

Principle 9. Choose methods, techniques and means of influence depending on the object (purpose), their own capabilities, time and situation.

It is quite evident that different types of weapons are generally the most suitable for hitting different targets. Therefore, if you change the goals may change ways and means of its achievement (or defeat). In turn, the transition from one means, approaches and methods to another may require a change of those who are able and able to use them. The transition to the new is also because each tool, each approach,

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[9] "Modern information warfare is an economic and political weapon — deepening information asymmetry; creation of a false image, that is, the ratings and reputations; the introduction of the enemy into confusion; the rejection of all the old moral and ethical values". (Vladimirov, 2007, p. 99).

tool and method has limits of its application and effectiveness of use.

As an example of replacement of some of the means of economic aggression with the other was the transition of a group of states led by the United States from the policy of technological dependence of the USSR on the Western countries to the technological blockade of the Soviet Union. And further, the transition to the policy of scientific-technological backwardness and financial dependence of the Russian Federation and again to the ban on the transfer of knowledge economy, patents, technology and credit constraints.

Indeed, by the Report to the President under the President's Directive of January 31, 1950, it was allowed to sell to the socialist countries new technologies and modern equipment they needed. The hidden motivation for this course was as follows (Bokarev, 2009). By acquiring equipment and technology, customers cannot produce their equivalents, respectively, to conduct research, to build an experimental database, etc. As a result, as the drafters of the report considered it, the USSR, the socialist countries and the countries of people's democracy will keep their scientific and technological gap in the future.

The acquisition of foreign technologies, as a rule, entails the purchase of foreign machinery and equipment. At the same time, the creators of technologies usually work with well-established manufacturers of technological equipment, which they will recommend to the buyer of their technology. Those, in turn, fabricate machinery and equipment, the use of which requires the use of tools, materials, raw materials with strictly defined quality and technical characteristics.

As a result, dependence on foreign technologies is fraught with dependence on supplies and suppliers of foreign equipment, equipment, tools, raw materials and materials, as well as on maintenance of purchased equipment by foreign companies (Figure 2).

For the purchase of equipment and technology in foreign markets and to pay for maintenance services requires foreign currency. To obtain the necessary volumes of foreign currency it will be necessary a) selling raw materials and materials, b) taking loans from foreign banks. Consequently,

the country's development will become export-oriented and dependent on foreign banks.

Since the calculations on the world markets are conducted in US dollars, then, ultimately, the loans came from the USA banks. Also, lagging in scientific and technological development entities (country, company, Corporation) will not compete with developed countries not only in the markets of these goods and services but also in the markets of licenses, patents, know-how, devices, test benches, etc.

The USSR's dependence on the import of pipes for the construction of oil and gas pipelines and on the export of hydrocarbons was used in the new round of "war with the Soviets" initiated by President Ronald Reagan (East-West Relations, 1982). It includes a ban on the transfer to the Soviet Union of some products and technologies necessary for the production and transportation of oil and gas. So, if in 1975 32.7 per cent of the exports items from the USA to the USSR were high technologies, and their total exports amounted to 219 million dollars, then in 1985 these figures fell to 5.4 per cent and 39 million dollars. (Bokarev, 2009, p. 262).

During the implementation of the "Ronald Reagan's secret plan", there were obstacles for the construction of a gas pipeline from Siberia to Western Europe. Also, they stopped the provision of loans to the USSR with the simultaneous coercion of the latter to early payment of interest on loans. Some actions led to a twofold drop in oil prices.

After the disappearance of the USSR from the political map of the world, its geopolitical and geo-economic opponents again changed their strategy. Again, they take the course to turn the Russian Federation into a supplier of raw materials, brains, skilled workers and at the same time an importer of foreign consumer goods. That is, ideologically, financially, scientifically, technologically, culturally and educationally dependent state. Behind the screen of the slogan "Abroad will help us!" the national science, education, culture, ideological foundations of society were destroyed, the flagships of the Russian machine and machine-tool industry, space and defence industry, city-forming and agricultural enterprises were bankrupt and closed, many types of production and logistics disappeared.

Table 4
COCOM member States and States are implementing anti-Russian sanctions in 2014–2018.

Members of the COCOM and cooperating countries, 1982	States implementing anti-Russian sanctions
Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the Netherlands, Turkey, UK, USA,	Albania, Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Moldova, Montenegro, New Zealand, Norway, Poland, Portugal, Romania, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland, the Netherlands, Turkey, Ukraine, USA

Scientific and technological dependence is a natural result of the backlog in education, science, and technology. In turn, "technological backwardness and dependence mean a decline in the security and economic opportunities of the country, and as a result — a loss of sovereignty" (President's Message, 2018).

Dependence in the field of information, communication and the digital technologies — the basis of advanced economies of the world and the economy of the future — well characterised N. Kaspersky, CEO of the InfoWatch group of companies, co-founder of Kaspersky Lab. She said: "We already see examples of how our economy, 'hooked' on the technology of previous digital races of Microsoft, Oracle, Siemens, suddenly turns out to be very dependent and vulnerable in the new era of deterioration of relations with the United States. By order of the Americans large, beautiful, public Western companies, which we believed, as itself, cease to issue updates to our corporations, disable credit cards to our banks, refuse to work in the Crimea? (Shadrina, 2018).

The anti-Russian sanctions of President Barack Hussein Obama based on Act. HR 3364 "Countering America's Adversaries Through Sanctions Act" hit on vulnerable areas of the Russian Federation technological and credit-financial dependence on developed capitalist countries, export-raw orientation of domestic economic entities and, as a consequence, the dependence of the financial well-being and income of the Federal budget of the Russian Federation on energy prices, which the state can not influence.

Principle 10. It is better to act with allies to increase your power, and even better — "to do something with someone else's hands".

The presence of allies usually increases the power of the belligerent. Also, there is an opportunity to share with them the burden of costs and the severity of losses. It was well understood by the leaders of 14 states that were part of two alliances — the Entente and the Central powers with their allies — invaded Russia during the civil war. In the intervention of 1918–1920 engaged troops of Australia, Austria, Hungary, Great Britain, Germany, India, Italy, Canada, China, Ottoman Empire, Poland, Romania, Finland, France and Japan.

The U.S. also attracted other States to the technological blockade of socialist countries and countries of people's democracy. Signed by President Ronald Reagan, the NCS-NSDD-66 Directive contains the following settings: "the U.S. should undertake intensive work within our Allies and within the IEA/OECD to encourage development of these Western alternative and to encourage that adequate safety net measures are adopted to protect against a shutoff of Soviet gas.

A quick agreement that allied security interests require controls on advanced technology and equipment beyond the expanded COCOM list, including equipment in the oil and gas sectors; development of a list of equipment in this category and an effective procedure to control its transfer to the Soviet Union" (East-West Relations, 1982).

This agreement was soon reached at the consultations with the U.S. Allies (Canada, Germany, France, Italy, Japan and the United Kingdom) in Washington conducted by the United States Secretary of State George P. Shultz in November 1982. (Summary of Conclusions, 1982).

The list of countries in which COCOM (Coordinating Committee on Multilateral Export Controls) limited and prohibited the export of the

latest industrial products, high technology and technical information included Albania, Bulgaria, Hungary, Vietnam, East Germany, Kampuchea, North Korea, Mongolia, Romania, Poland, USSR and Czechoslovakia.

The number of COCOM's members exceeds the number of States participated in the intervention in Soviet Russia — 17, plus six countries that cooperated with them. In 2014, the number of participants in the global economic aggression against the Russian Federation increased to 41 (Table 4).

Because global economic aggression done by the states or group of states, it must also be opposed by the government. It is vain to hope the market itself can handle with sanctions, individuals and legal entities themselves will survive. We should not rely on the third law of Newton — "for every action, there is an equal and opposite reaction", etc. Strong can be defeated by force and cunning.

At the same time, the response to aggressive actions should not be a specular reflection. First, the enemy hits our weak points, but they have completely different ones. Therefore, we should not do the same as he does. We ought not to influence (and with the same force) on the same objects that are affected by the aggressor. Pressing on its painful areas is necessary. For example, China refused to import the US oil and Iran refused to import electronic devices from the US in response to the US trade duties imposed in 2018. Secondly, the coalition of countries, including its members, is economically stronger than modern Russia and has a large arsenal of means of influence. Russia cannot respond to them with the same economic strength.

Here is a calculation based on official statistics. For example, the anti-Russian coalition of countries willing to sacrifice for the struggle with Russia to 0.001 per cent of its total gross domestic product (GDP) created in 2017. If the Russian response strikes them with the same force, the total loss of the aggressors will be 0.002 per cent of their total GDP. Russia, however, for such a direct response is equal to the force required to donate 3 per cent of its GDP in 2017.

By the straight symmetric (mirrored) response Russia will deplete resources without causing appreciable damage to attackers. Therefore, it is advisable to use not direct actions, but small 'injections' in the most painful places. At the same time, one should always remember that it will take a long time to fight, and therefore it is better to compare what is better for us: to spend forces and means to cause retaliatory damage or to direct our resources to strengthen our positions to such an extent that the efforts of the aggressors are in vain.

From economic war and global economic aggression, it is necessary not only to protect themselves but also to deprive the opponent of opportunity and desire to fight. For this purpose it is necessary, at least, to protect weak points (it is even better not to have them) and to increase the power of the state.

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Принципы глобоэкономической агрессии

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Аннотация. Для характеристики исследуемых экономических войн и агрессий автор статьи использует приставку «глобо», а не «гео», потому, что, во-первых, непосредственной целью агрессии является экономика, а не территория или политический строй. Во-вторых, потому, что агрессия осуществляется вне зависимости от территориального расположения ее жертвы, и в агрессии, как правило, участвуют несколько субъектов, т.е. она имеет глобальный характер. В-третьих, потому, что термин «геоэкономическая агрессия» уже используется для обозначения теории новой геополитической борьбы. Вынесенное в заголовок слово «агрессия» употребляется в статье на том основании, что войны объявляются, а глобоэкономические действия чаще всего совершаются тайно. Глобоэкономические войны и агрессии ведутся не одно столетие, и нет оснований ожидать их скорого окончания. Уже поэтому полезно знать принципы (гласные и негласные), которыми руководствуются их инициаторы и организаторы. В статье приводится десять принципов ведения глобоэкономической войны и агрессии и дается характеристика каждому из них.
Ключевые слова: принципы; агрессия; непрямые действия; разрушение экономики; стратегия; СССР; Российская Федерация
JEL classification: F49, F51, H56

Analysis of Fundamental Indexation as an Efficient Approach to Active Investing

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Abstract

For many years researchers have been arguing on whether active investing is superior to passive investing by giving theoretical and empirical rationale underlying their beliefs. A desire to over-perform passive investing by utilising fundamentally-justified methodology has led to the development of numerous active and semi-active strategies, such as Fundamental indexation established in 2005 by Arnott *et. al.* In their research, the authors suggested constructing investment portfolios by assigning the weights of each asset concerning the values of its fundamental indicators. This approach has met heavily critique for the lack of theoretical rationale, by not being able to connect the values of selected fundamental indicators to the future performance of the portfolio. In this research, the thesis of passive investing superiority has been challenged by constructing an active investing strategy based on Fundamental Index described by Arnott *et al.* (2005) — Modified Fundamental Index and testing it on the UK stock exchange companies. The resulted portfolio showed superior performance compared to the cap-weighted index while also having lower risks and higher diversification. Also, I suggested some ideas for further research concerning MFI.

Keywords: Fundamental indexation; value drivers analysis
JEL classification: G11

For decades researchers and practitioners have an intense discussion, whether the active or passive approach to investing is superior, giving solid rationales for both sides of the argument. The difference between those is in a way, how investments are managed concerning an overall market or what is called "index". However, during recent years, many argue that active investing is much more inferior regarding performance comparing to simply replicating an index[1]. In other words, there is no point in performing complex financial analysis for investment valuation purposes; one can't do better than the overall market does.

The goal of current research is to check the hypothesis whether active investing is superior to passive investing by developing and utilising fundamental indexation strategy for the retail industry. It utilises a financial analysis of a certain business model throughout the industry to establish a solid theoretical rationale for fundamental index strategy.

The objectives of the current research are as follows:
- To identify the theoretical rationale underlying fundamental indexation and critically evaluate typical approaches, as well as parameters used for fundamental index construction;
- To outline value creation factors as an essence of fundamental indexing;
- To develop a fundamental index for the retail sector by mostly relying on value creation factors;
- Back testing of a strategy developed and checking, whether active investment might be superior over passive.

[1] One of the most popular valuation "guru" A. Damodaran in his recent article "Active Investing: Rest in Peace or Resurgent Force?" has argued that it is not possible for an active investor to beat an index on a constant basis.

Literature Review

"Fundamental Indexing", as a new technique, was firstly introduced by Arnott *et al.* (2005). The underlying logic is to construct a portfolio in which each share from the universe of shares similar to a conventional index is weighted according to a series of fundamental indicators. Fundamental Indexing is a trademark of Research Affiliates, LCC.

The theoretical rationale underlying fundamental index supports the thesis that it is an active strategy. Chen C. *et al.* (2007) stated that market prices are a noisy approximation of fundamental values, and as far as they tend to revert to fundamental values, weighting shares according to fundamental characteristics will generate excessive returns comparing to the cap-weighted index. Siegel (2006) calls this Noisy Market Hypothesis (NMH), which is in contrast with Efficient Market Hypothesis. Treynor (2005) and several other researchers state that conventional cap-weighted indices overweight overpriced stocks and underweights underpriced.

After Fundamental Index firstly appeared, some researchers recognised that it is a value investing strategy. Clifford (2006) states that the Fundamental Index is an active strategy with a value tilt. He also proves the point by pointing out Fundamental Index underlying assumptions. Despite disagreement followed by Arnott, Hsu and Campollo, it is still widely recognised as a value strategy by many researchers and practitioners[2].

The most popular approach to identifying value creation factors or value drivers is a simple decomposition of valuation techniques and claiming each separate indicator a value creation factor.

Different researchers by utilising various approaches come to a different list of value creation factors. Trusova N. (2014) by utilising an EVA-based approach to valuation described by Koller *et al.* (2010) considers ROIC, WACC, Invested Capital and organic growth rate being the main value drivers. With further analysis, she also decomposes those into Sales, COGS components, SG&A, turnover ratios and WACC components. By deepening this approach, Frol-

ova *et al.* (2016) suggest further constituents which form aggregate indicators stated above: price and quantity of product sold, the structure of assets a company possess etc. I agree with both researchers in their findings. What is far more important, both researchers emphasise the importance of the industry aspect on overall value creation factors. However, by utilising the EVA approach, which has been derived from trivial DCF approach, the actual value is a subject for tremendous uncertainties. As Greenwald *et al.* (2001) have stated, "Profit margins and required investment levels, which are the foundations for the cash flow estimates, are equally hard to project accurately into the future". Hence, this makes DCF extremely vulnerable regarding long-term forecasting, as the quality of forecasts is worsening with increased modelling period. As an alternative, I suggest utilising stochastic, rather than discrete models for valuation purposes. However, distribution parameters justification issue would still exist.

Kogdenko and Melnik (2012) divide all the factors into external and internal groups. Macroeconomic, regional, industrial and market factors represent the external group. The internal group consists of financial and non-financial factors, among which are client satisfaction indicators, management efficiency and internal business processes indicators. Zolotukhina (2015) names factors according to the following stages: purchases, production, sales, marketing, finance, management, IT, innovations and PR. Even though I fully agree with those value construction factors, it seems to be a serious issue to quantify and access them freely for most of the companies worldwide. Also, I agree with Zolotukhina that 20 per cent of factors defines 80 per cent of the value (Pareto principle).

Fundamental index technique might be enhanced by replacing conventional pameters with more sophisticated measures of a firm's performance, its capital structure and other areas of possible value creation. Also, in contrast to the approach established by Arnott *et al.*, only a composite index would be established as only by considering all the related issues, true value indicator might bestablished. Rather than just showing "earnings" or "book value" market, this index we can view as the closest approximation to the fundamental values market indicator.

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[2] For example, Blitz and Swinkelz (2008) came to this conclusion in their research.

Methods

The goal of current research is to prove the thesis that an active strategy based on fundamental indexation approach might constantly outperform passive strategy on a risk-adjusted basis. I employed a *Sharpe-ratio* as a measure of return considering riskiness of the investment

Returns of shares and covariance between them are exogenous variables; that is, we can only change weights to change the values of portfolio return and standard deviation and accomplish targets stated. Considering the fundamental indicators should be used for weights identification, the resulting weight vector can be calculated as follows:

$$\overline{w_f} = \begin{pmatrix} f_{11} & \cdots & f_{1j} \\ \vdots & \ddots & \vdots \\ f_{i1} & \cdots & f_{ij} \end{pmatrix} \text{x } \overline{F}^T, \qquad (1)$$

where

$\overline{w_f}$ — vethe ctor of weights in futhe ndamental portfolio,

f_{ij} — the value of jth fundamental indicator for i^{th} company,

$\overline{F}^T$ — is a vector of coefficients which transforms fundamental values for each company into weights.

As a consequence of (1), we might outline two important steps in identifying the weight vector according to each goal:

1. Identification of fundamental indicators for index construction;

2. Identification of appropriate coefficients for a coefficient vector.

As I already stated before, the fundamental index developed in this paper is intended for portfolio construction of retail food equities. Hence, the indicators forming the weights as well as the values for F-vector might be significantly different for other industries or other instruments portfolios, such as bonds. For the model construction purposes, I used the European food retailers' data. I excluded other regions due to the different level of competitiveness and slight differences in its business models. That is, even though the indicators applied might be of use, the F-vector might be significantly different. For the current research, I chose the UK food retail industry due to the availability of information about indus-

try constituents, an actual number of companies trading at the stock exchange and transparency of business model.

The index is intended to be rebalanced on an annual basis as most fundamentals are available with this frequency; so, for a model construction purposes, we can utilise annual data. The period of data to construct an index is from the 1st of January 2005 to the 1st of January 2014. It covers all stages of a business cycle and also includes the crisis period of 2008. From the 1st of January 2014 to the 1st of January 2017 I suppose using the back testing of a model developed would be performed.

Also, there is a limitation implied in this model that the companies cannot be shorted, so the weights in the weight vector can only be positive. However, the possibility of negative coefficients for the coefficient vector still exists.

Usually, regression analysis techniques largely represented the statistical methods. Stochastic models are used for testing the performance of the final model considering various assumptions; for instance, Monte-Carlo simulation is performed for estimating possible results. For modelling purposes, Microsoft Excel software is used with Palisade@Risk add-in preinstalled, allowing stochastic building models. We can use SPSS software for regression analysis and hypothesis testing purposes.

Choice and justification of fundamental variables for portfolio construction are probably one of the most important and challenging issues of current research. As I stated before, initial fundamental index (Arnott *et al.*, 2005) has been based on fundamentals utilised in conventional multiples, such as Earnings, Sales and Book Value of Equity. Even though these fundamentals are assumed to be heavily used in various approaches to valuation, there might be issues regarding the predictability power of these. For instance, the Sales value in 20×1 might not be a good predictor of stock performance in 20×2.

In articles mentioned earlier, undervalue creation factors researchers use established valuation approaches and use its components as a value creation factors. Even though these statements are reasonable, it is still important to mention that only future values of the majority of such indicators contribute to value creation, while present and past values only influence stock's past performance. Hence, to define possible outper-
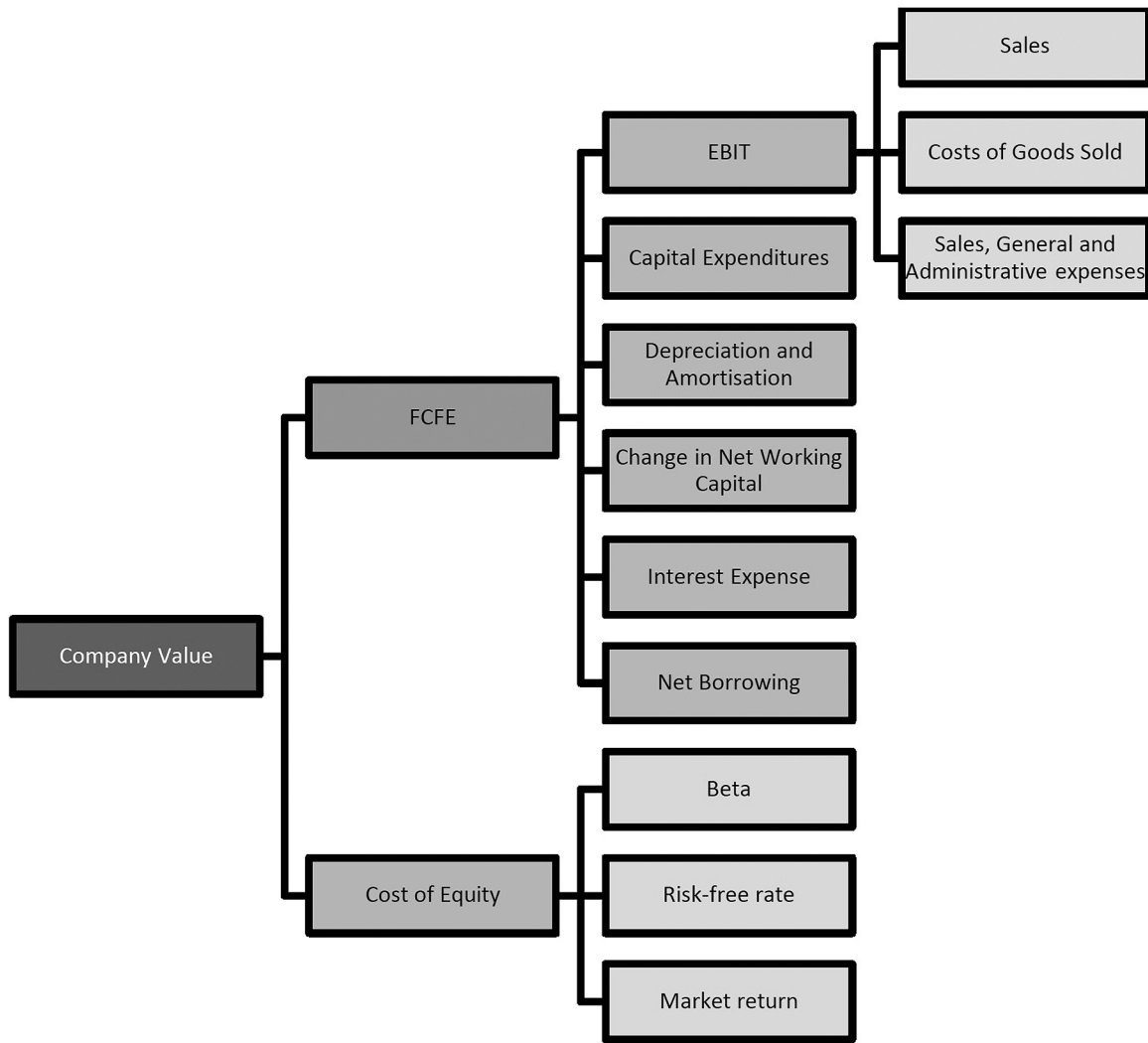
Fig. 1. Value components tree according to FCFE discounting approach.

formers, one should focus on factors that outline possibilities for future growth.

So, to construct a portfolio aiming at better performance, the goal is to find a proxy of future values for value creation factors. For key value drivers identification, I used the DCF approach (FCFE-based modification) decomposition due to the following reasons:

1. It is heavily reliant on fundamentals of the company and to the significant extent ignores current market attitude;

2. The concept of this is closely related to the conclusions about future value creation potential stated above;

3. FCFE approach doesn't allow performing a valuation for a firm with unstable cash flow patterns; however, by focusing on its components rather than an absolute value, we are avoiding absolute values and focusing on company's potential.

The suggestion is to filter the fundamentals already suggested in the scientific literature which are utilised in DCF valuation and find proxies that influence the future values of these fundamentals being its leading indicators. The following filters will apply: (1) the fundamental importance of an indicator considering the business model in a food retail industry and justification of appropriate proxy and (2) constructed multi-collinearity issues of a model.

The first criterium is based on the fundamental importance of a certain indicator in a particular industry. To justify such importance, various business processes of the retail food industry, as well as accounting policies in this respect have been reviewed and analysed to express a reasonable opinion. The first criteria also address the issue mentioned that a certain indicator could not be treated similarly for companies from different sectors and industries. This issue exists

in a conventional fundamental index, where all companies are weighted according to earnings, without any adjustment for the sustainability of these earnings, its quality and efficiency of a company. By addressing this issue, the model is constructed for a specific industry only but is of higher reliability and accuracy. Also, proxies are being justified from a fundamental standpoint to better suit the purposes of fundamentals values prediction.

The second criteria address the issues of multi-collinearity. As a final weight is being constructed using an additive model, there is a possibility of two variables being closely connected. That is, if COGS proxies are closely connected to sales proxies, that would be a mistake to include both of these indicators into the model. The reason is, multi-collinearity appears in cases where a certain factor is accounted for two times. While this holds true, if there are no signs of fundamental evidence of multicollinearity between two particular indicators, this issue would not be addressed.

Value components tree according to FCFE discounting approach is represented below.

The reason for such model is to pick companies according to proxy values of future fundamentals. It is obvious that for companies in the same geographical and business conditions, some factors mentioned above are of the same value; that is, market returns and risk-free rates will stay the same regardless of which company we would pick. So proxies of different values for each company should be picked rather than taking the values of macro indicators.

Larrabee (2012) names different studies that collectively prove that the majority of portfolio performance comes from allocation between asset classes rather than selecting a particular asset. That is, insignificant portion of returns are explained by factors that are unique for each company, while the majority of returns explained by factors that are typical for the whole industry. Even though we cannot eliminate these as those are systematic risks, it is possible to increase or decrease exposure to certain factors by switching the weights of securities in the portfolio.

As a result, there are 14 proxies for future values of free cash flow to equity-based valuation model components that I will use in the current model:

Table 1
F-vector values

F-vector	
Indicator	Value
GM change	3.66
D/E	0.00
Interest rate and Risk-free dif	0.49
Av. Beta	1.95
Remaining Useful Life	–
Revenue growth on the Disposable income growth regression slope coefficient	–
Revenue growth on the Population growth regression slope coefficient	0.04
Trading area	1.61
SG&A expenses to Revenue growth	–
COGS on AI	–
Inventory Turnover Change	–
AP turnover change	–
Fixed assets growth	3.77

1. Revenue growth on Disposable income growth regression slope coefficient;
2. Revenue growth on Population growth regression slope coefficient;
3. Trading area growth;
4. SG&A expenses growth to Revenue growth;
5. COGS growth on Agricultural Index growth regression slope coefficient;
6. COGS growth on Functional currency exchange rate growth regression slope coefficient;
7. Average gross profit margin;
8. The average change in Inventories turnover;
9. The average change in Accounts payable turnover;
10. Fixed assets remaining useful life ratio;
11. Fixed assets growth;
12. Debt to equity ratio;
13. The current difference in the cost of debt and risk-free rate;
14. Average beta.

Then, I constructed the correlation matrix has been for these variables. The only indicators that are in strong correlation are COGS growth on Agricultural Index growth and COGS growth on Functional currency exchange rate growth regression slope coefficients. The possible fun-
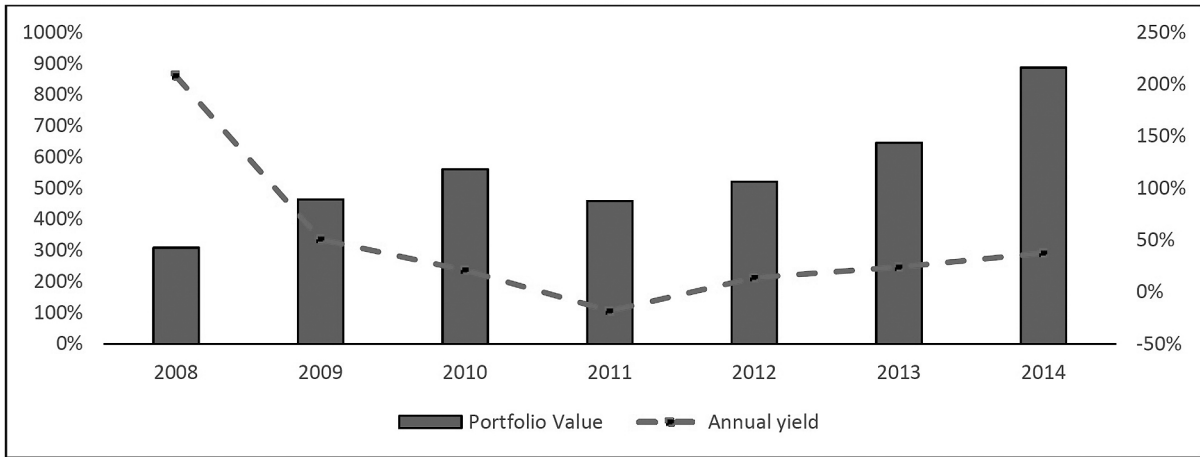
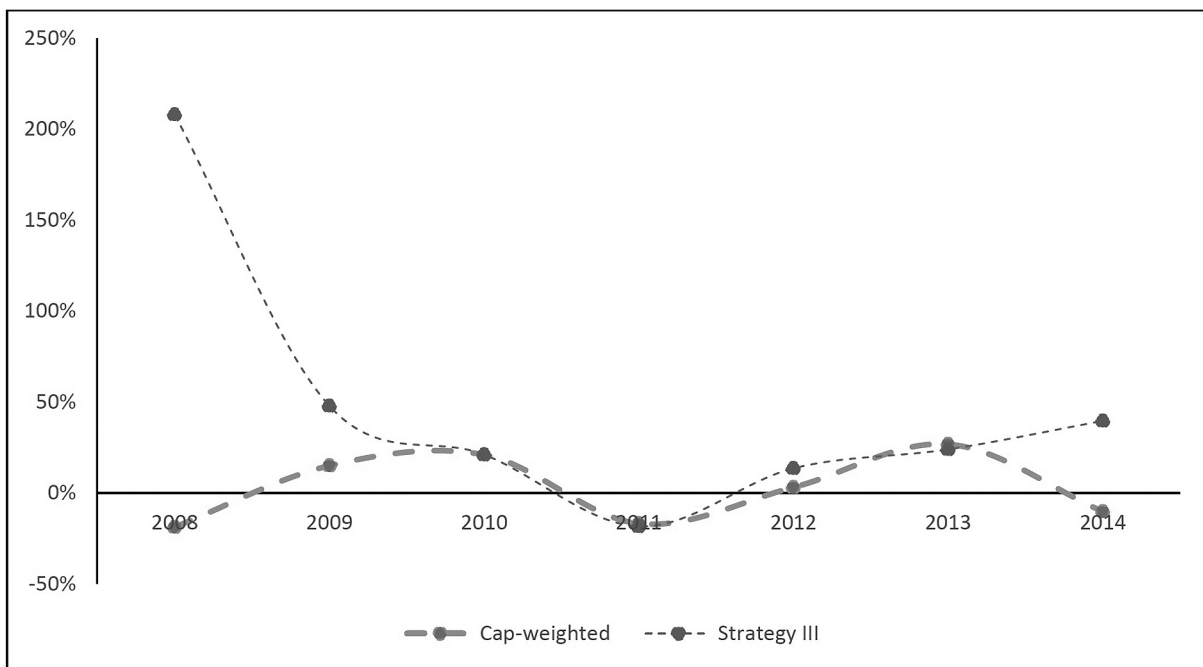*Fig. 2.* Fundamental index portfolio dynamics from 2008 to 2014.

Fig. 3. Strategies return comparison from 2008 to 2014.

damental explanation is that the exchange rate can be linked to the commodities markets, in particular, agricultural commodities. While this might not constantly hold, we might assume that the movements in Agricultural Index influence the exchange rate (Investopedia, 2016), hence, COGS growth on Functional currency exchange rate growth regression slope coefficients will be excluded from the model. Overall, all coefficients have very low correlation coefficients, which means that there are no signs of multicollinearity.

The next step is an F-vector construction by utilising the fundamentals suggested.

From the equation (1), by knowing the matrix of fundamentals for the period from 2007 to 2014[3], and having the goal to achieve the highest Sharpe Ratio, we can define the optimal values for F-vector by utilising the Solver add-in for Microsoft Excel.

The return graph for the strategy using these F-vector values are as follows.

This strategy yields a 36.57 per cent annual return. The standard deviation of this is 0.32, the Sharpe ratio for this strategy equals to 0.72 with 13.36 per cent risk-free rate assumption. The concentration ratio for this strategy equals 0.059.

Overall, the Strategy is viewed to be the most efficient from the point of view of modern port-

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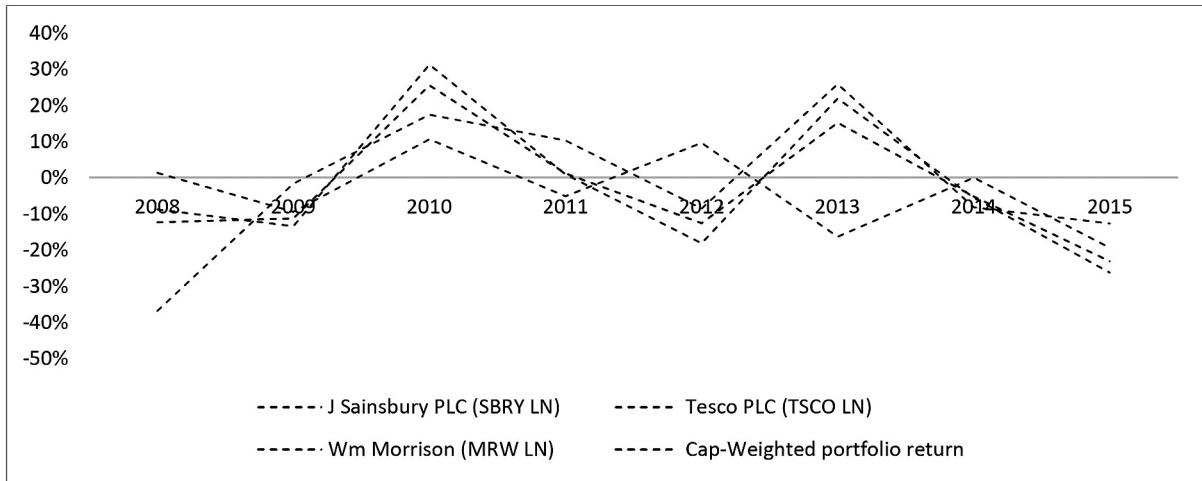[3] 2015 and 2016 were excluded for the purpose of after-forecasting period model backtesting.

Fig. 4. Cap-weighted portfolio annual return dynamics, %.

folio theory as it maximises the Sharpe ratio. Because it has a high standard deviation, it still provides a possibility to combine it with other investment vehicles to adjust risk/return preferences according to one's needs. In the following references, this will be referred to AFI (adjusted Fundamental Index).

To enhance the model accuracy, it is suggested for the model to be rebalanced after each period to better account for stock relations and estimation of the explanatory power of indicators. Overall, the results of back-testing are seemed to be positive, which arise the questions about the further efficiency of the model in a particular market rather than on the general sample of all stocks.

The next step is to apply the Modified Fundamental Index to the universe of food retail public companies operating in the United Kingdom to form a portfolio based on the strategy described above. Than this portfolio performance should be compared to the performance of the common cap-weighted portfolio to see if it yields better results and thus if the hypothesis of the superiority of MFI active strategy over the passive one holds.

Firstly, I will review the UK food retail market to identify the current situation and to analyse companies' comparative position. This analysis will facilitate the application of the strategy from the fundamental standpoint and will contribute to the further evaluation of differences in indicators values for constituent companies.

The largest part of a retail food market in the UK belongs to supermarkets and hypermarkets, which collectively account for more than 65 per

cent of total sales volume[4]. As of 2016, market size exceeds USD 200bn with a CAGR of approximately 1.2 per cent.

Considering the degree of rivalry at the UK market, it can be characterised as high. There are several large chains of supermarket, hypermarket and convenience stores that control most of the market while keeping the competition quite high. The highest competition driver is negligible switching costs for consumers due to the unified nature of products. At the same time, expanding its presence is still limited due to the lack of geographic regions not already covered with its chains and high CAPEX to open a new hypermarket.

Four major players on the market tend to control most of its share, namely:

• Asda Stores Limited
• J Sainsbury Plc
• Tesco Plc
• Wm Morrison Supermarkets Plc

The UK food retail market that is largely represented by supermarket chain companies has only three public companies. Nevertheless, an investor that is interested in including the UK food retail exposure to his or her portfolio has numerous possible combinations of structuring such an investment. So the next step is to analyse the performance of the cap-weighted index out of these companies and to compare it to the portfolio constructed according to the MFI methodology.

At first, we can construct a market capitalisation-weighted index out of these three companies

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[4] MarketLine Industry Profile. Food Retail in the United Kingdom.
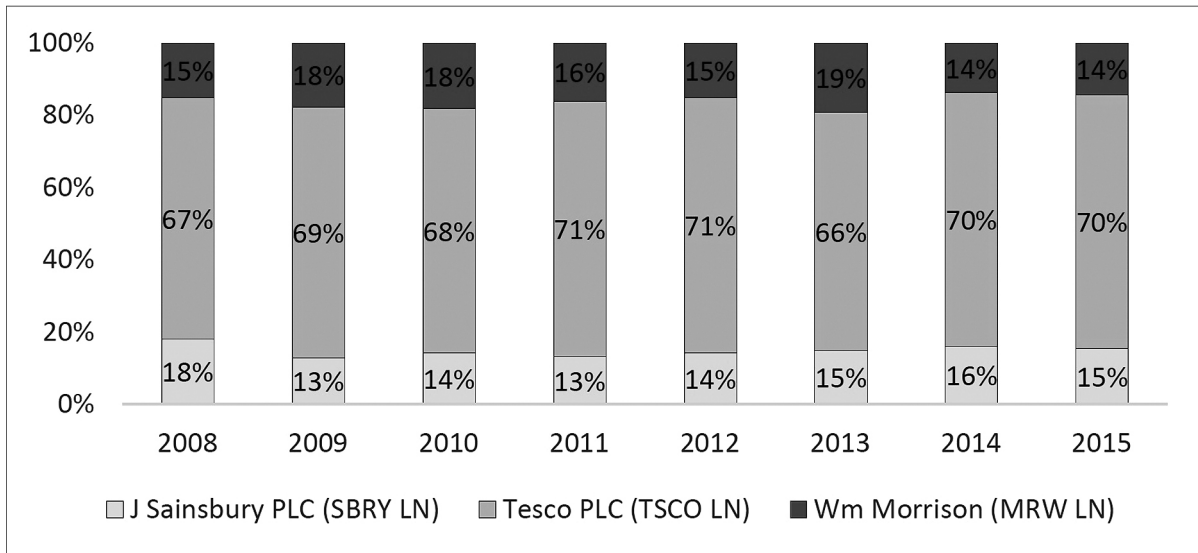
Fig. 5. Cap-weighted portfolio structure per share, %.
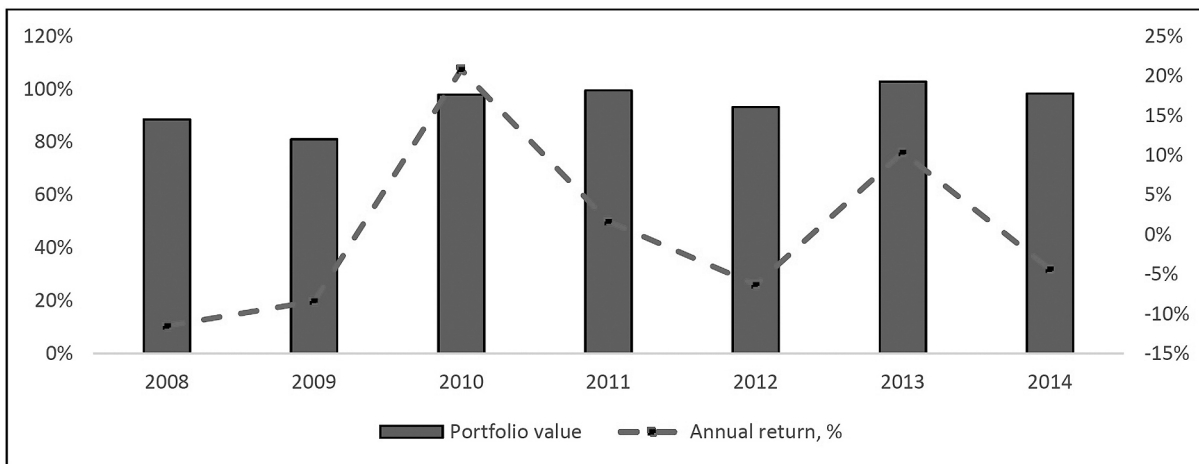

Fig. 6. MFI based portfolio value dynamics, %.

and analyse returns of such a portfolio as well as its structure.

Conventional cap-weighted portfolio of these companies had demonstrated poor performance throughout the whole testing period. Its average annual return equals −11.3 per cent, changing from −23 per cent p.a. in 2015 to +26 per cent in 2010. Considering the standard deviation of returns, its overall Sharpe ratio throughout the testing period equals −0.7, which means that for each pound invested into this portfolio, investor got an additional negative return. Obviously, such an investment cannot be called successful considering its riskiness and demonstrated returns.

Let's than analyse the structure of this portfolio throughout the whole period of testing.

As we can see, the largest part of this portfolio throughout all period has been allocated to Tesco shares, while other companies have collectively only allocated 30 per cent of all the funds. In this respect, we can assume that such a portfolio has a lack of diversification as the excessive allocation of funds in a single asset increases unsystematic risks. Also, from Figure 5, we see that Tesco had the poorest average performance out of three companies which explains poor overall portfolio performance.

Next, we can evaluate the performance of a portfolio based on MFI approach.

Even though this portfolio also has a negative average return of −0.2 per cent, it has much higher results comparing to the conventional portfolio. It also has a close range of return values — from −20 per cent in 2015 to 21 per cent in 2010 that also contributes to a higher Sharpe ratio value of −0.15. Hence, this portfolio demonstrates much higher results comparing to the conventional one
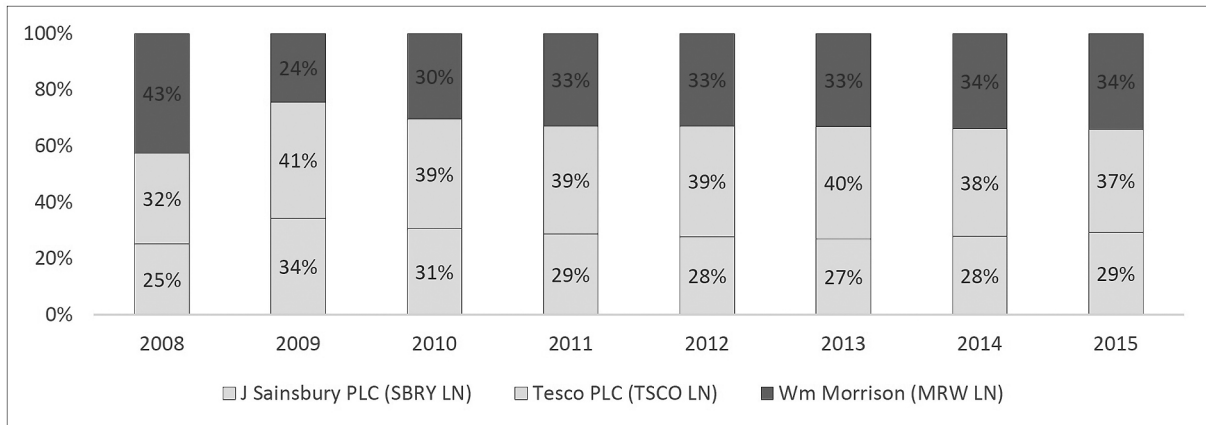
Fig. 7. MFI based portfolio structure per share, %.

while also taking into account the associated risk of the portfolio.

MFI portfolio structure is much more diversified, as each company accounts for about 1/3 of the total portfolio, which provides much higher diversification benefits. The reason is that fundamental parameter values of this companies are not that different, which gives them reasonable share in total portfolio. There is, however, a higher portion of Tesco at the market, which might also be justified considering its high gross profit margins as well as the closer connection of revenue with a disposable income of a population.

In general, there is evidence of MFI-based strategy being superior to the conventional index strategy. The main reason is its higher degree of diversification, which also might vary depending on the values of fundamental indicators used for the construction of this portfolio.

Conclusions

For many years, there was an argument of whether active or passive investing is superior, with each side supporting their opinion with solid empirical and theoretical evidence. Many versions of active strategies, as well as the whole approach to passive strategies, have been changing, leading to the establishment of hybrid approaches, smart-beta strategies etc. In 2005, Arnott *et al.* have developed an approach that has been called Fundamental indexing, in which authors suggest to weight assets in the portfolio according to their fundamental metrics, such as sales, net income, asset base value etc. This approach has been heavily criticised from theoretical, as well as practical standpoint due to the lack of a conceptual base and proven empirical inefficiency. In this research, the thesis of passive investing superiority has been challenged by establishing an active investment approach based on Fundamental Indexing which has been called Modified Fundamental Indexing. It was designed to overcome the weakest point of initial methodology, the lack of connection between fundamental indicators used for portfolio construction and future portfolio performance. Specifically constructed for the food retail industry based on the European company's data, Modified Fundamental Indexation while applied to the UK stock market demonstrates higher average annual return with lower standard deviation which also leads to relatively higher Sharpe ratio and overall superiority over the cap-weighted index which is viewed to be a passive investing approach.

The established methodology has practical and theoretical value. Firstly, its positive testing results together with overall concept prove that active investing can be superior to passive while we consider different aspects of related investment assets. Secondly, the whole approach to deriving fundamental indicators and relative coefficients for this methodology can be used not only to rebalance F-vector and construct a better portfolio but also as an instrument for financial analysis of fundamental indicators concerning their influence on investment performance. Finally, MFI, with necessary adjustments, can be used by investment and portfolio managers as a tool to construct efficient active portfolios based on solid fundamental base. Still, MFI has its weak points and fields for development which are considered to be further researched by the author.

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Анализ фундаментальной индексации как эффективный подход к активному инвестированию

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Аннотация. На протяжении многих лет исследователи спорят о том, является ли активное инвестирование лучше пассивного, давая теоретическое и эмпирическое обоснование, лежащее в основе их убеждений. Стремление переоценивать пассивное инвестирование, используя фундаментально обоснованную методологию, привело к разработке многочисленных активных и полуактивных стратегий, таких как фундаментальная индексация, основанная в 2005 г. Робертом Арноттом, Я. Хсу и Ф. Муром. В своем исследовании авторы предложили строить инвестиционные портфели путем присвоения весов каждому активу относительно значений его фундаментальных показателей. Этот подход был подвергнут серьезной критике за отсутствие теоретического обоснования, поскольку он не позволял увязать значения отдельных фундаментальных показателей с будущими показателями портфеля.

Тезис о превосходстве пассивного инвестирования автор статьи оспаривает с помощью построения активной инвестиционной стратегии на основе фундаментального индекса, описанного в Arnott et al. (2005), — Модифицированный Фундаментальный Индекс (МФИ) — и протестированного на данных компаний, которые котируются на Британских фондовых биржах. Портфель показал более высокие показатели по сравнению с взвешенным по капиталу индексом при более низких рисках и более высокой диверсификации. Кроме того, автор предложил некоторые идеи для дальнейших исследований, касающихся МФИ.

Ключевые слова: фундаментальная индексация; анализ стоимостных драйверов

JEL classification: G11

The Background and Perspective of the Development of the 4ᵗʰ Industrial Revolution

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Abstract

Today the 4ᵗʰ Industrial revolution (also called the Digital revolution) embraces the global economy rapidly, becomes a vital part of almost every sphere of life. In the article, a description of the main aspects arousing the development of the Digital revolution if given; its most vital driving factors, challenges and threats for the present economy are characterised. Also, the ambiguity effect of the 4ᵗʰ Industrial revolution is considered; much attention is paid to the outcomes which can be observed today or with the high degree of possibility will arise in the near future in the most important spheres of life: economic, political and socio-cultural ones. The possible ways of overcoming the risks and reducing the influence of threats caused by the 4ᵗʰ Industrial revolution are described. Overall, the problem of digitalisation is considered from the historical perspective.

Keywords: the 4ᵗʰ Industrial Revolution; industrialisation; digital development; technologies; global economy; globalisation

JEL Classification: O33

The Digital revolution pervades the global economy and impresses us with its scope and rates of development. Since 1960es digital innovations have been spreading all over the world, so today they can be found everywhere: from computers and the Internet to robotics and virtual reality [3].

The following stages of human development can be distinguished: Agricultural, Industrial and Post-industrial periods. Today we are facing the 4ᵗʰ stage — the Digital revolution, which can also be called as "the second computer age" [1], "the 4ᵗʰ Industrial revolution" or "Industry 4.0". This revolution creates a world where both virtual and physical objects interact with each other (sometimes even without human`s help) contributes to vital breakthroughs in such spheres of knowledge as genetics, mathematics, IT, etc.

The ambiguity of the Digital revolution consists in the fact that we are witnessing the wholesale expansion of new technologies, while 17% of the population of the world is waiting for the Industrial Revolution, about 1/3 (4 billion of people) — for the Post-industrial revolution [4]. Consequently, it spans mostly overdeveloped countries, increasing the gap between them and developing countries or the ones with transition economy.

Among driving factors of the Digital revolution are the following ones: uncrewed vehicles, 3D-printing, robotics, genetics, new materials, crypto-currency, digital health care, new forms of business, the Internet of things. The advantages of these innovations are apparent: uncrewed vehicles and drones let people with disabilities move quickly in the city, they can also be used in agriculture; 3D-printing makes manufacturing wasteless, creates individual goods; robotics help in performing routine work, increase productivity. New materials that can control the temperature inside can be used in building

homes. With the use of crypto-currency people or organisations who are on different continents and unfamiliar to each other can make deals and transfer money without fear of a fraud; digital health care means health control using portable devices and mobile applications to contact and communicate with doctors immediately.

During last years new forms of business, such as crowd-funding platforms, social networks, websites offering all kinds of services (from babysitting and shopping to parking a car), online-shops and taxi services were created. The peculiarity of these new forms is that they do not have any stock of goods but merely serve as connectors or intermediaries between customers and producers. They make the cost of a good or service cheaper, combining supply with demand (sometimes even from very distant countries).

What is more, the Internet of things (a connection between objects of physical and virtual worlds by technological platforms) gives an opportunity of creating "smart homes" and even "smart cities". Just imagine a city without traffic jams due to un-crewed cars following the traffic rules and reacting immediately on unexpected events; a home which saves electricity and water, turning it off when they are not used; clothes telling you about your activity during the day and physical condition.

In highly developed countries Artificial Intelligence (AI) almost surrounds us: innovations and new technologies have changed our lives so much, that we can hardly imagine our existence without them. However, it is worth pointing out that all above mentioned fundamental changes can be seen as a mixed blessing do not only give great opportunities but lead to potential threats. It explains the growing interest of many scientists, organisations and committees to the subject. For example, the World Economic Forum in 2015 published a report where 21 Technology Tipping Points forming a new digital world were described [6]. It is remarkable that all these moments may occur in the nearest ten years.

Consequently, we would like to describe the influence of the Digital Revolution on the most important spheres of our life. These spheres encompass economic, political and socio-cultural ones.

The 4ᵗʰ Industrial revolution will affect the world`s economy fundamentally. Due to the application of robotics and innovations productivity will increase, causing economic growth. As a result, the quantity and quality of goods produced will grow to make

prices go down. Moreover, robots can replace people not only in routine jobs (i.e. conveyor worker) but also in the professions of an accountant, a driver, a phone operator, etc. The automated workforce is cheaper, works without breaks and performs practically without mistakes. Such replacement will cause a great amount of unemployed all over the world. Jobless people may protest. Subsequently, problems in the political sphere may occur. To avoid this, special courses for the unemployed should be created, where they will be able to retrain for professions like managers, designers, IT specialists, doctors, that will be still in demand.

One more problem the Digital revolution may bring lies in the economic sphere: it is inequality. Consumers on the one side — they share all advantages of the revolution, such as the Internet, applications which help in calling a taxi or buying goods. Manufacturers, who collide with some problems — on the other side with the decrease in the percentage of labour in GDP, the decline in the price of capital goods [2], replacement of labour with capital. As a result, investors, shareholders and inventors (the suppliers of intellectual and physical capital) gain the most benefits of the Industrial Revolution, while workers, who earn their living by hard manual labour are desperate and can lose their jobs.

The next thing worth mentioning is that with the help of digital technologies, companies will be able to receive more transparent and full information about clients, their needs and preferences. This information becomes corporations` competitive advantage and leads to more customised manufacturing of individual goods. Nowadays an increasing number of firms in many spheres turn from producing goods to providing services. It can be explained, in turn, by a growing amount of people who prefer not to buy a physical object, but to pay for a service of using the object whenever they need (car-sharing, e-books).

The Industrial revolution permits businesses to create a product or service with minimal workforce expenses. What is more, the amount of companies lacking any assets or practically without any capital grows enormously: "WhatsApp" or "Instagram" did not need large sums to start the business, but today they are yielding very high profits. The companies which will be in need for capital and human resources will pay more attention to hiring and retaining highly qualified specialists because personnel become the dominant fact of competitive advantage.

Summing up the influence the Digital revolution on the economy we can admit that it gives an opportunity for enormous economic growth, creating new forms of businesses, usage of innovative technologies, but also causes inequality, unemployment, increases the gap between developed countries and ones with the economy in transaction, leading to tense political relations, conflicts or even wars.

Let us consider the political sphere and the Digital revolution. Undoubtedly, the introduction of digital technologies will lead to better governance: the number of officials can be reduced — replaced by robotics. Consequently, the level of bureaucracy may increase; corruption declines the productivity of work increases meanwhile. It should be kept in mind that according to changes in the economic sphere, many countries will face unemployment, which will lead to people`s discontent and reduce the inflow of money from taxes. Due to this fact, governments will need to interact closely with business, create new workplaces, retraining courses, normative documents and laws to control technological achievements and innovations.

The governments of developed countries should unite their efforts not to let the Digital revolution separate these countries from non-developed ones. Also, the introduction of digital technologies in developing countries will help in predicting natural disasters, saving natural resources, curing infections, etc. The Digital revolution will cause profound influence on international relations and international security. Supposedly, the rate of migration will rise, diminishing cultural differences, national individualities and traditions.

One of the greatest disadvantages of the revolution in the political sphere will be the possibility of usage of digital technologies by criminal groups. With such helpful innovations, they will be able to communicate faster on long distances, produce more harmful and accurate weapon causing international threat. On the other hand, these technologies can provide governments with better weapons and protective clothing, or even robots, drones and automated weapon with Artificial Intelligence that will be able to fight without human interference.

The most vital problem of the Digital age becomes cybernetic war. The more digital data is received, synchronised and kept in the country, the more it is subject to cyber attacks. If governments introduce a system of payments with crypto-currency, the number of cyber thefts and frauds will increase sharply. As a result, authorities of different countries ought to cooperate to create international rules and regulations controlling new technologies in the military and security sectors.

The third sphere we would like to take a look at is a socio-cultural one. As we have previously mentioned, the influence of the Digital Revolution on the economic and political sphere will cause inequality. According to Credit Suisse "Global Wealth Report" in 2017 "while the bottom half of adults collectively own less than 1% of total wealth, the richest decile (top 10% of adults) owns 88% of global assets, and the top percentile alone accounts for half of the total household wealth" [5]. As a result of increasing inequality of income and unemployment, the number of social unrests or even riots can rise.

The positive factor is the 4th Industrial revolution gives access to various kinds of information whenever you need it, an opportunity to communicate with relatives on long distances, find new friends according to common interests, consume electricity and water carefully, recycle waste and even improve the ecological situation. New technologies help people with disabilities to move in the streets, communicate with others, study or work. On the contrary, the Digital revolution creates a self-contained, forever-online society, where everyone is concerned only about his own needs and wants, unwilling to help others or communicate face-to-face, preferring to chat online. Moreover, it is necessary to have access to various types of information, points of view, but we can never know whether to trust the facts or not, is the opinion reliable or is it just dictated by somebody.

A threat of cyber-crime can also be seen in the socio-cultural sphere. The more personal data is kept in digital bases or websites, the more privacy of life is in danger. In our opinion, the most momentous problem of the digital society is ageing. The birth rate almost in every country declines, consequently, the number of the able-bodied population also decreases, so the productivity falls. It has a very harmful effect on economic and political spheres.

Having observed the influence of the Digital Revolution on the main spheres of life (economic, political and socio-cultural), we have concluded that this revolution can be perceived as a mixed blessing: on the one hand bringing with it great opportunities to people, on the other hand causing considerable threats. To this day, technologies have been helping us to perform more efficiently and quickly with minimal effort. But we should remember the potential

risks and threats from the use of these technologies are large-scaled. Some examples of these opportunities, as well as threats of the 4ᵗʰ Industrial revolution, were described in the article.

To overcome the risks mentioned above and reduce possible threats for the revolution authorities, businesses and civil society ought to unite their efforts, integrate and work in close cooperation. Only through international collaboration and confidence in each other we can achieve a sustainable, bright future and solve arising global problems, overcome inequality and unemployment. It is also important to advance one`s intellectual level: competent and

knowledgeable people with a high level of expertise will be successful and powerful because they can compete and surpass the AI.

Today we are at the very beginning of the Digital revolution and can determine the way of its evolution. So let`s be responsible and form the future where innovations and technologies will satisfy our needs, lead to sustainable development and improvement of the level of life. We believe it is in our hands to solve arising problems and introduce necessary changes to preserve traditions, moral values, cultural individualities and even achieve technological and economic growth.

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Предпосылки формирования и перспективы развития четвертой промышленной революции

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Аннотация. На сегодняшний день Четвертая Промышленная революция (она же — Цифровая революция) стремительными темпами охватывает мировую экономику, становится важной частью практически каждой сферы жизни. В данной статье приведено описание основных аспектов, побуждающих развитие Цифровой революции и ее наиболее важные движущие факторы. Охарактеризованы вызовы и угрозы сегодняшней мировой экономике. Рассмотрен эффект двойственности Четвертой Промышленной революции. Особое внимание уделено последствиям, которые можно наблюдать уже сегодня или которые с большой степенью вероятности возникнут в недалеком будущем в наиболее важных сферах жизни: экономической, политической, социально-культурной. Описаны возможные пути преодоления рисков и уменьшения влияния угроз, вызванных Цифровой революцией. Проблема цифровизации рассмотрена автором в исторической перспективе.
Ключевые слова: Четвертая Промышленная революция; индустриализация; цифровое развитие; технологии; мировая экономика; глобализация
JEL Classification: O33

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