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CHALLOUMIS Constantinos K. PhD. In Econ. Sc.
Greece

INDEX OF THE CYCLE OF MONEY – THE CASE OF BELARUS[8]

The purpose of this paper is to apply the theory of cycle of money to the cases of Belarus. Prior works have determined the economic characteristics of the case of Latvia, Serbia, and Bulgaria, according to the concept of the theory of cycle of money. The index of the cycle of money suggests how an economic system should counteract a monetary crisis and studies how well-structured is Belarus's economy. The estimations of the index of the cycle of money of Belarus are compared with the global average index of the cycle of money. The results reveal that Belarus is close to the average global value. Then, Belarus's results show that it is a well-structured economy and can face an economic crisis. The applied methodology stands on the analysis of the theory, mathematical, statistical, and econometrical results. The current work is important as represents the strength of Belarus's economy to a potential financial and economic crisis. This work is from a project for multiple countries. Finally, the recent decision of 15% minimum tax to the international companies complies with the Fixed Length Principle of the theory of cycle of money that developed the last years.

Keywords*: the cycle of money, Belarus, index of the cycle of money.*

ЧАЛЛОУМИС Константинос К., канд. экон. наук
Греция

ИНДЕКС ЦИКЛА ОБРАЩЕНИЯ ДЕНЕГ НА ПРИМЕРЕ БЕЛАРУСИ

Цель данной статьи – применить теорию денежного цикла к экономике Республики Беларусь. Предыдущие работы позволили определить экономические особенности Латвии, Сербии и Болгарии в соответствии с концепцией теории денежного цикла. Индекс денежного цикла показывает, как экономическая система должна противодействовать денежно-кредитному кризису, и изучает, насколько хорошо структурирована та или иная экономика. Индекс денежного цикла Беларуси сравнивался со средним мировым индексом денежного цикла. Результаты показывают, что параметры экономики Беларуси близки к среднемировому значению. Кроме этого, результаты анализа показывают, что ее можно отнести к хорошо структурированным экономикам, устойчивым к экономическим кризисам. Применяемая методология основана на анализе теоретических, математических, статистических и эконометрических результатов. Текущая работа важна, поскольку позволяет получить сравнительную характеристику устойчивости экономики Беларуси к потенциальному финансовому и экономическому кризису. Эта работа является частью проекта для нескольких стран.

Ключевые слова: *денежный цикл, Беларусь, индекс денежного цикла.*

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Introduction. This paper studies the dynamic of the economy, of Belarus, using the concept of the cycle of money. The prior results of Latvia's, Serbia's, and Bulgaria's results revealed the behavior of these countries to a potential crisis. Then, following similar logic, it is examined the case of Belarus. The theoretical background of the cycle of money supports that the dynamic of an economy is based on the idea of the number of times that money is used in an economy. An economy should be considered not as a closed system, but as a system with fragments. An economy with fragments means that the economy interacts with other economies but simultaneously protects its money. An amount of money in many cases is getting out from an economy to external banks, or other economies. The mainstream is that the bigger companies and the international companies in most cases are saving their money to external banks and economic heavens. Therefore, according to this theory, the tax authorities should put an additional tax on this kind of company to decline the losses to the economy. Additionally, the smaller companies and the freelancers should be taxed with lower tax rates. Then, it would be plausible to increase the dynamic of the economy. Also, the factories, the know-how services of big companies, the health care system, and the educational system comprise a special case for the economy, as belong to those cases where the taxes improve the quality of the economy. The factories and the big know-how companies increase the cycle of money, as they do not substitute the activities of the small-medium companies and the freelancers. The educational and health care systems improve the quality of the economy, making the whole economy better. Therefore, this paper sought to make clear how the concept of the cycle of money, works in an actual case scenario like this of the economic system of Belarus. The index of the cycle of money suggests how an economic system ought to counteract a monetary crisis and examines how well-structured is a country's economy. The estimations of the index of the cycle of money of Belarus are used for a comparison with the global average index of the cycle of money. The results reveal that Belarus is close to the average global value and therefore could face an economic crisis, as it is a well-structured economy. The concept of the cycle of money reveals that the taxes return to the economy, in the case of the education and the health care system (these are exclusions from the mainstream where taxes support the economy). But, the mainstream is that the tax authorities should maintain the taxes to the lowest level. For small and medium companies, the government should protect them with very low taxes and contemporaneously should put greater taxes on the larger companies. But, there is a type of big and international companies that should have low tax rates, as these types of companies are not substituting the activities of smaller companies.

These types of big companies are factories and technological know-how companies. Then, the principal idea is to have a financial system, with the best allocation of production. Larger companies should not provide similar products and services, like that of smaller companies, as they can make investments in economic fields that smaller companies cannot support. In that way, an economic system achieves its best level. Additionally, the idea of the cycle of money shows that with the appropriate allocation of production units and of taxes the money is cycled inside the economy achieving the maximum dynamic of the economy. This paper is about Belarus s index of the cycle of money. The research is based on an actual case scenario of a country's economic system. Therefore, the principal hypothesis of this paper aims to estimate the index of the cycle of money of Belarus and to answer the question of its near the worldwide general index of the cycle of money, according to the simple index or the general index of the cycle of money. The cycle of money of Belarus should be close to the worldwide general index of the cycle of money, to be able to counteract a potential depression. The applied approach is based totally on mathematical estimations from the relevant theory. The results confirmed that Belarus's economic system is properly established, as it follows the general international index of the cycle of money (the value of 0.5) which represents the average global case. (Challoumis, 2018) The countries over 0.2 and near to the value of 0.5 have an appropriate distribution of money to their financial system. Consequently, Belarus's economic system is considered as well established, standing on the results of this paper. The question about the way that works the index of the cycle of money to the case of Belarus is answered from the structure of its economy and the way that distributed the money to its economy. Besides, it needs some

improvements to have an even better index cycle of money. Therefore, Belarus should decrease taxes for small and medium enterprises, to achieve better reuse of money in the country's economic system, and to increase taxes to big and international.

Literature Review. The cases of Latvia, Serbia, and Bulgaria revealed that are above the limit of 0.2 and in general close to the average rate of 0.5, concluding that these countries can counteract a potential crisis. The fix length principle can enforce the cycle of money. The case of Latvia presented the condition of the country's economy and how to react to an economic crisis, according to the index of the cycle of money. These results are formed on the theoretical approach of the theory of the cycle of money, where this theory presents that to an economy the taxes return to the society, basically to the case of the education and the health system. But, the main rule is that the authorities should keep the taxes as low as is plausible, for the medium or small economic units (meaning any kind of economic unit e.g. freelancers), and companies (Lerner, 1936; Mirman, 1971; Gihman *et al.*, 1972; Kushner, 1974; Wilson, 1986; Wijnbergen, 1987; Zax, 1988; Meyer and Rosenbaum, 2000; Feinschreiber, 2004; King, 2009; Ross, 2010; (ATO) *et al.*, 2012; United Nations, 2012; Ainsworth and Shact, 2014; Nations, 2014; Boland, 2014; Ossa, 2014; OECD, 2015, 2017; McKay, Nakamura and Steinsson, 2016; Waworuntu and Hadisaputra, 2016; IMF, WB and WTO, 2017; Lindé and Pescatori, 2019; Merle, Al-Gamrh and Ahsan, 2019; Caldara *et al.*, 2020; Choi, Furusawa and Ishikawa, 2020; Goswami and Purkayastha, 2020; Irawan, Kinanti and Suhendra, 2020). The arm's length principle is the principle where the authorities use to apply the taxes to international and to groups of companies. The arm's length principle is the method that the tax authorities to estimate the tax obligations of the companies, which participate in international transactions. The authorities using the arm's length principle are tough to obtain the controlled transactions, as the international companies offer similar data with that of the uncontrolled transactions and they are hiding with a purpose to avoid paying taxes. Therefore, the government needs to apply the fixed-length principle. The fixed-length principle indicates that the companies of controlled transactions manage transactions and

achieve to avoid tax paying. Then, according to the fixed-length principle, international companies should pay plus a fixed amount of tax (IMF, et al., 2017). In that way, the cycle of money is enhanced, because the larger companies generally receive the money out the society and the economy and save them to international banks. Therefore, that money is lost from society, diminishing consumption(Constantinos Challoumis, 2018a, 2019c, 2019b, 2019f, 2019g, 2020a). Then, according to the fixed-length principle, the local companies which save their money to local banks should have lower tax rates.

Concluding, the fixed-length principle serves the theory of the cycle of money, where the small and medium companies are paying lower taxes than the larger companies, which substitute their commercial activities. On the other hand, the arm's length principle estimates the taxes standing on methodologies provided by the companies that make international transactions. In that way, the large companies cover the activities of the smaller companies. Finally, the mainstream is that small and medium companies robust the distribution of money to a country's economy as usually they don't save their money out of the country's economic system, and reuse the money inside the economy(Constantinos Challoumis, 2018c, 2019a, 2020d, 2021d). Therefore, the money distributed inside the economy many times increases the cycle of money. The reason where the money increases the cycle of money is obvious according to eq. (4) of the general index of the cycle of money. The last decision of 15 % minimum tax for the international companies complies with the Fixed Length Principle of the cycle of money; where last years suggested an additional standard tax to these companies as they don't reuse the money to country's economy, but they save them to tax heaves and to international banks.

Methodology. The methodology applied for the current study is presented below, being in the same line with the presented theory. The calculations of the cycle of money are clarified by the following mathematical types:

$$c_y = c_m - c_\alpha \qquad (1)$$

$$c_y = \frac{dx_m}{dm} - \frac{dx_m}{da} \qquad (2)$$

$$i_{cy} = Y * b_d \qquad (3)$$

$$g_{cy\,Country} = \frac{c_{y\,coyntry\prime s}}{c_{y\,Average} + c_{y\,coyntry\prime s}} \quad \text{or}$$

$$\frac{i_{cy\,coyntry\prime s}}{i_{cy\,Average} + i_{cy\,coyntry\prime s}} \qquad (4)$$

$$g_{cy\,Average} =$$

$$\frac{c_{y\,Average}}{c_{y\,Average} + c_{y\,Average}} \text{ or } \frac{i_{cy\,Average}}{i_{cy\,Average} + i_{cy\,Average}} =$$

$$0.5 \qquad (5)$$

The c_m is the velocity of financial liquidity, c_{α} is the velocity of escaped savings and c_y is the cycle of money. The i_{cy} is the index of the cycle of money, Y is the national income or GDP, and b_d is the bank deposits of the country. In addition, $g_{cy\,Country}$ symbolizes the general index of c_y of the country, $i_{cy\,coyntry\prime s}$ or $c_{y\,coyntry\prime s}$ is the index of c_y of the country, and $i_{cy\,Average}$ or $c_{y\,Average}$ is the global index of i_{cy}. Finally, $g_{cy\,Average}$ is the general global index of c_y, and is obtained as a global constant (Constantinos Challoumis, 2021g, 2021a, 2021f, 2021c, 2021e, 2021b).

Therefore, the main hypothesis is to establish the connection between the index of global average c_y, the bank deposits and the GDP per capita, with an econometric approach. Then is confirmed the initial hypothesis that the cycle of money of Belarus is close to the global average index of the cycle of money. The eq. (4) and (5) mean that an economy close to the value of 0.5 can face immediately an economic crisis. Results close to this value represent an appropriate index of the cycle of money, revealing an adequate economic structure of the society and then the fine distribution of money between the citizens - consumers. Equation (1) is the term of the cycle of money which used to define the $c_{y\,coyntry\prime s}$ and $c_{y\,Average}$ of eq. (2). The cycle of money to a quantity value is expressed by GDP, basically is an expression of $\frac{\partial(GDP)}{\partial(S+I+X)}$ and $- \frac{\partial(GDP)}{\partial(S\prime+I\prime+M)}$. Then, $c_y = d(GDP) = \frac{\partial(GDP)}{\partial(S+I+X)} d(S + I + X) - \frac{\partial(GDP)}{\partial(S\prime+I\prime+M)} d(S\prime + I\prime + M)$. Then, S is the savings, I is the investments and X is the exports. Then, S', is about the savings which are oriented to banks out of the country's economy, I', is about the investments which oriented to

banks out of the country's economy, and M are the imports. Therefore, the cycle of money expresses the GDP as the following one: $Y = S_T + I_T + (X - M), or\, Y = (S - S\prime) + (I - I\prime) + (X - M)\, or\, Y = \Delta S + \Delta I + (X - M)$. Theoretically, for the lost money from the economies, the problem of controlled transactions could be administrated, if an organization could identify the money transitions between the economies, by a comparison of the global economies, by ΔS, ΔI, and (X-M).
Therefore, $c_{ytotal} = \sum_{i=1}^{n} \sum_{t=1}^{m} c_{yi,t} = \sum_{i=1}^{n} \sum_{t=1}^{m}[\frac{\partial(GDP)}{\partial(S+I+X)} d(S + I + X) - \frac{\partial(GDP)}{\partial(S\prime+I\prime+M)} d(S\prime + I\prime + M)]_{i,t}$. But, because data from an organization for these activities don't exist follows the application of the index of the cycle of money (Constantinos Challoumis, 2018e, 2018d, 2018b, 2018f, 2019d, 2020b, 2020c). The cycle of money is an expression of the minus between the differential equations of the volume of money that is used in an economy and the volume of money that are lost from the economy. This is the reason why the theory of the cycle of money supports the higher tax of companies that make controlled transactions and the bigger companies because with that way the smaller companies are using an amount of money multiple times. An exemption is for the high technology companies and the factories, where their activities cannot substitute by smaller companies.

Results. Standing on the prior methodology extracted the following results. This table includes the parameters of bank deposits, GDPs, and the indexes of the cycle of money. This section reveals the dependence of Belarus's index of the cycle of money using the bank deposits of Belarus's economy and the GDP per capita of Belarus's economy. The bank deposits of the global average case and the global GDP per capita are used for the comparison of Belarus's economy, its GDP, and the country's bank deposits.

The same conclusions come up and from an econometric point of view, with the dependent variable to be the index of the cycle of money (*Table 1*).

To the prior table, the values with two asterisks symbolize the cases that the coefficients are below the 0.05 significant level, and accordingly, the three asterisks are the case of 0.01 signif-

icant level. The indexes reveal Belarus's distribution of money and the form of its economic structure (see Table 2). The first three rows of the table reveal that the p-value is important, therefore the initial hypothesis was rejected and the model is accurate. Pursue to those estimations and the theoretical background is determined the condition of the economic structure of the country and if Belarus belongs to the very good economies. Should be mentioned that is used the period of 2012 -2017. It is selected that period as was critical for E.U. as many economic formations happened, especially for countries with high debts; affecting and other economies. According to these results, it's plausible to clarify the condition of the cycle of money in Belarus.

Should be noticed that Bank deposits are used as a percentage of GDP because in that way it is plausible to extract conclusions, about the whole economy per GDP and to make comparisons easier with other countries. Belarus's bank deposits.

To figure 1 presents the situation of bank deposits of Belarus's financial system, as a percent of GDP, for the period from 2012 to 2017. In addition, the next scheme presented the GDPs of Belarus.

Figure 2 presents the condition of the GDPs of Belarus's economy for the period from 2012 to 2017. Also, the next scheme presents the GDPs of Belarus, for the same period.

According to prior results, the index of Belarus's c_y is 2,961,364.11 \$

We obtain from the prior results that:

The index of global average c_y is 5,509,172.04 \$

Calculating the general index of the cycle of money for the case of Belarus and of global view we have that:

− The general index of c_y for Belarus is $g_{cy\ Country} = 0.35$

− The general index of c_y of global view is $g_{cy\ Average} = 0.5$

Table 1. – Belarus's OLS regression analysis (Source: author's compilation)

Variable	Coefficient	std. error	p-value
Constant	−535650	31124.0	0.0034 ***
Belarus's bank deposits	18712.9	195.982	0.0001 ***
Belarus's GDP per capita	30.6000	1.90141	0.0038 ***
Global index of the cycle of money	−0.0405437	0.0165628	0.1341

Table 2. – Belarus's index of the cycle of money (Source: Globaleconomy.com and author's compilation)

| Year	Bank Deposits Global Average per GDP (%)	Bank Deposits Belarus per GDP (%)	Global GDP per Capita ($)	Belarus's GDP per Capita ($)	Index of Global Average C_y ($)	Index of Belarus's C_y ($)
2012	52.48	21.99	16,653.01	18.576.73	873,949.96	408,502.29
2013	53.96	23.54	17,266.62	18,760.16	931,706.82	441,614.17
2014	55.81	24.35	17,159.02	19,066.89	957,644.91	464,278.77
2015	59.38	28.47	15,295.71	18,307.52	908,259.26	521,215.09
2016	60.77	31.83	15,330.03	17,822.61	931,605.92	567,293.68
2017	60.07	30.55	15,082.49	18,280.20	906,005.17	558,460.11
RESULTS					5,509,172.04	2,961,364.11
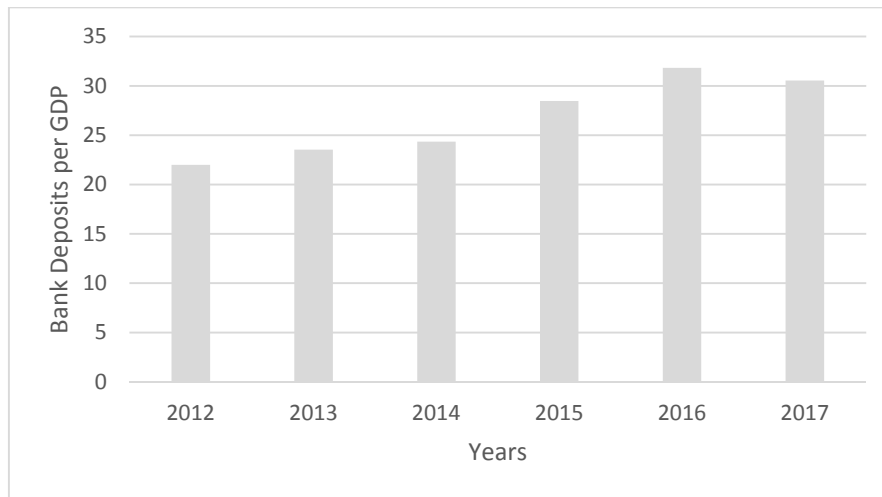
Figure 1. – Belarus's bank deposits (Source: Globaleconomy.com)
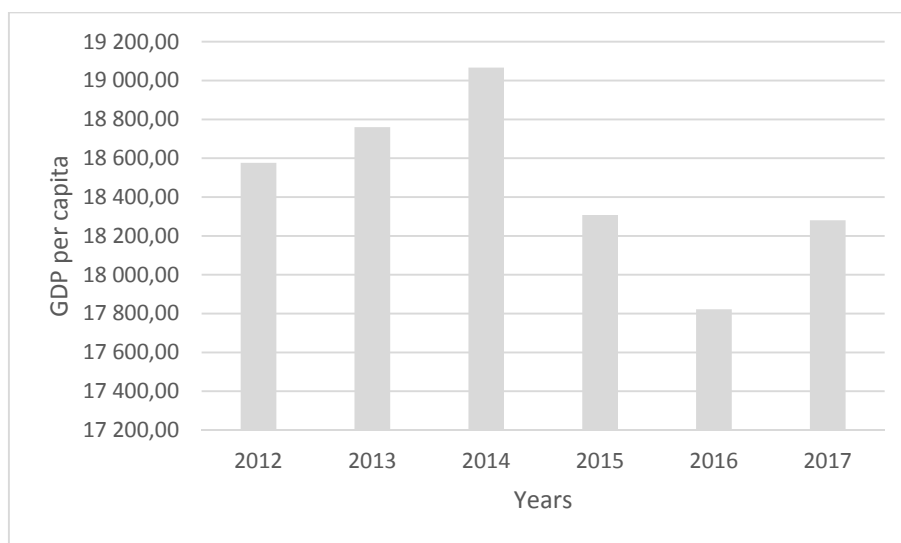

Figure 2. – Belarus's GDPs per capita (Source: Globaleconomy.com)

Therefore, it is concluded that Belarus's index cycle of money is close to the global average cycle of money. Then, the dynamic of Belarus's economy complies with the global average and its structure is near to the initial hypothesis. Then we receive the next scheme:

Based on the prior scheme, it is concluded that the index of the cycle of money of Belarus's economy is close to the global average of the index of the cycle of money, which is 0.5 (considered as a global constant). Belarus's index of the cycle of money is 0.35. Countries over 0.2 can face an economic crisis. As higher is their index, then faster can return to their prior condition. The countries that are near 0.5 have a well-structured economy - standing on eq. (5), according to the theoretical background of the cy-cle of money. This conclusion means that the economic structure of Belarus has a medium distribution of money to its economy. Besides, Belarus could proceed to more reforms, as the international and the bigger companies still sub-stitute the local medium and small enterprises. The authorities should apply the fixed-length principle, then higher taxes should be put on the bigger companies. In that way, the distribution of money inside the economy will be increased, and social welfare will be boosted. The government should protect more the small and medium enterprises to avoid losing money from transac-tions of bigger companies.

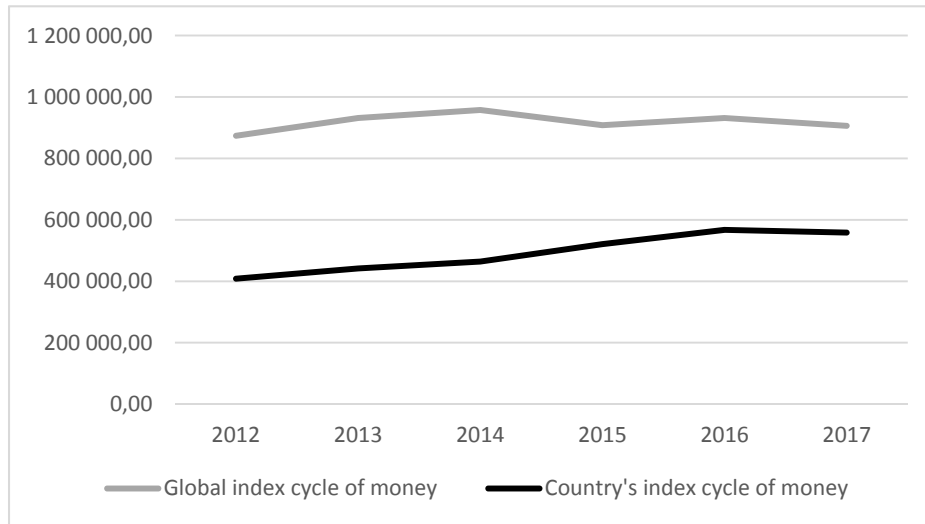The general index of the cycle of money ap-pears to the following figure.

Figure 3. – Graph of the index of the cycle of money (Source: author's compilation)
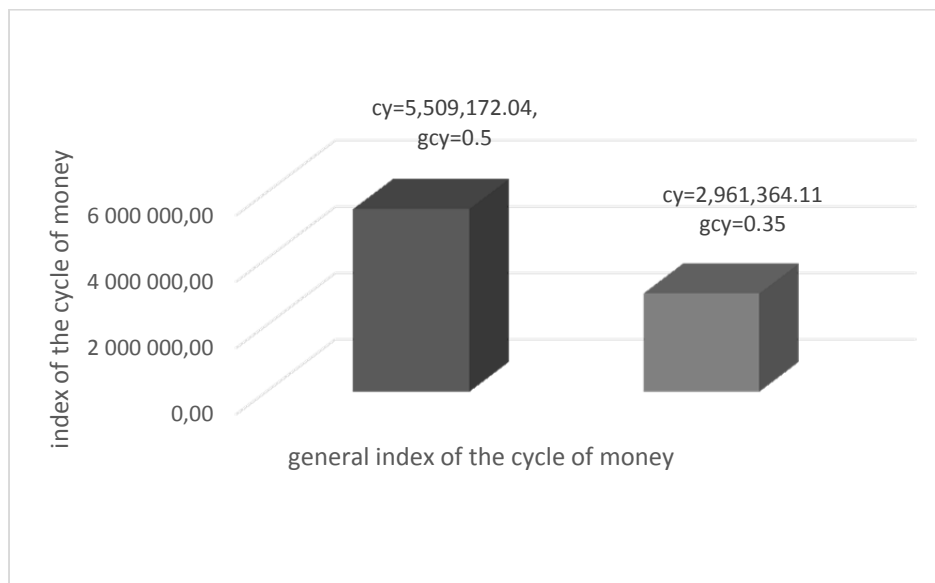

Figure 4. – The cycle of money indexes (Source: author's compilation)

The prior scheme has presented the combination of the index of the cycle of money with the case of the general index of the cycle of money. It is represented the affiliation between the global average indexes and Belarus's index. Belarus is part of the countries which are close to the global average index of the cycle of money, both for the simple index and general index.

Discussion. The interpretation of the current results is that Belarus's financial system belongs to the medium level of the cycle of money, then there has a medium dynamic. But, Belarus's economy could be improved more. Then, the structure of the economy may be improved, with

decreased taxes to the small and medium companies, and an increase of taxes to the bigger companies. In addition, the bigger companies have to provide economic activities that smaller businesses can't support, then the authorities ought to imply low taxes to know-how companies and factories. Consequently, big companies must no longer replace smaller businesses' activities. The investments of a country are boosted by the increase in the distribution of money. A country with a well-based economic system is a country with a good cycle of money and therefore it can face an economic crisis. Belarus's economic system is close to the index of com-

mon GDP per capita (meaning the value of 0.5), from 2012 to 2017 using the index of average GDP per capita. The branches of international banks if are included in the system of the economy are considered as part of this economy, then as international banks are considered the banks which keep the money outside the economic system of each economy (meaning especially banks of tax heavens or international banks which keep money out of the economies as part of black money and huge amounts of money that will not return to the countries' economies). Moreover, if a country has a low rate of bank deposits per GDP, but comply with the theory of the cycle of money, then it is obvious that there is a problem with black money. The black money increases the cycle of money as in some way is reused to the economy but decreases the cycle of money if is deposited outside the economy. So, black money belongs to the grey area, for the economy. But, in any case, the index of the cycle of money reveals if the economy has black money. In addition, the tax policy if it is not able to identify the bigger companies from the smaller companies, means that has a bureaucratic problem, as these identifications should be directly visible for government's data.

The cycle of money supports the free competition and the tax policy of Fixed Length Principle between the economies, and according to them shows the directions that should be followed to the economy is that companies with big capital should be invested in factories and companies of high technological products, not to substitute products and services that can offer smaller companies. Small and medium enterprises are the most accurate and quick way to develop the private sector to a country, making wider the tax bureau minimizing with that way the taxes.

Conclusion. According to the outcomes of the table, Belarus is close to the worldwide average index of the cycle of money. From figure 2 and figure 3 the index of the cycle of money is revealed Belarus's distribution of money is to a medium rate. The cycle of money of the country permits a very good distribution of money. The losses of the local banks are to a medium degree. But, the country's economy could be better due to the fact an amount of money is excluded from the local financial system by worldwide transactions (see table 2). The current model complies with the initial assumption, showing the distribution of money to Belarus's economy. Belarus's economic system tends in the last years to have the same reuse of money inside the financial system as in the past, as tends to have the same characteristics as a financial system that complies with the idea of the cycle of money. Belarus's financial dynamic is close to the worldwide average cycle of money, as the value is 0.35 shows that Belarus's economy tends to have a good distribution of money. Finally, the shadow market is not a problem according to the theory of the cycle of money, as critical is to keep the money to a country's economy and not move them outside it. If money stays in an economy, then it is a matter of time to be taxed or by direct or indirect tax. Then, for this reason, international and big companies should be taxed higher than smaller companies, as they substitute their activities and save their money outside the economy. On the contrary, smaller companies use and reuse their money to the economy and save them to local banks, increasing the cycle of money.

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