Index of the cycle of money - The case of Slovakia

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Abstract

This paper studies the cycle of money works in an actual case scenario like this of the economic system of Slovakia. Prior works have examined the case of Latvia, Serbia, Greece, Thailand, and Bulgaria, following the concept of the theory of cycle of money. The index of the cycle of money suggests how an economic system ought to counteract a monetary crisis and examines how well-structured is Slovakia's economy. The estimations of the index of the cycle of money of Slovakia are compared with the global average index of the cycle of money. The estimations reveal that Slovakia is over to the average global value. Then, Slovakia has a well-structured economy and can overpass an economic crisis. The applied methodology uses the analysis of the theory, mathematical, statistical, and econometrical results. The current work presents the strength of Slovakia's economy to a potential crisis. This means that a tax policy should consider that companies with big capital should have tax privileges to invest in manufacturing and high technology services and goods; leaving the rest of the companies to act to better free-market conditions. Otherwise, companies that substitute activities of smaller ones should be taxed higher. The applied period is that of economic crisis, 2012 - 2017, as this period is considered critical because of the economic crisis in the EU.

Key words

the cycle of money, Slovakia, general index of the cycle of money, reuse of money, distribution of money

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Introduction

This paper examines the dynamic of the economy, of Slovakia, using the concept of the cycle of money. The prior results of Latvia's, Serbia's, Greece's, Thailand's, and Bulgaria's results revealed the behavior of these countries to a potential crisis (Constantinos Challoumis, 2021f, 2021b, 2021c, 2021e, 2021d). Then, following similar logic, it is examined the case of Slovakia. 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. Using this theory, the tax authorities should put an additional tax on these kinds

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of companies to decline the losses to the economy. Moreover, 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 (Z. Acs, Åstebro, Audretsch, & Robinson, 2016; Bakaki & Bernauer, 2018; Campos, Braga, & Correia, 2019; Rashid, Warsame, & Khan, 2020; Rumayya, Rammohan, Purwono, & Harymawan, 2020). 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. The cycle of money of Slovakia should be over or 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 Slovakia'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 (Campos et al., 2019; Forson, 2020; Lajas & Macário, 2020; Rumayya et al., 2020).

The countries near 0.5 and above it have an appropriate distribution of money to their financial system. Consequently, Slovakia'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 Slovakia 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, Slovakia 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. 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 (Arabyan, 2016; Jeon, Kim, & Kwon, 2020; Jia, Liu, Lieske, & Chen, 2020; Miailhe, 2017; Wu, Yu, Wei, & Yang, 2019).

These types of big enterprises are factories and know-how technology companies. The mainstream idea is to have an economic 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. Thus, an economic system achieves its best level. The concept 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 Slovakia 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 Slovakia and to answer the question of it's 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 main objective of this research is to determine the index of the cycle of money for the case of Slovakia. The clarification of the cycle of money of the country will reveal its economic structure. In general, countries with values over 0.2 can counteract an economic crisis. The world general index of the cycle of money is 0.5. The countries with a value close to 0.5 counteract depression or economic crisis fast. In the case of Slovakia, is expected to have a value over 0.5. Moreover, the general index of the cycle of money, defines how well-structured countries' economy is. As high values indicate that country has high distribution and reuse of money, meaning that the small and medium enterprises make profits, ameliorating the country's bank system and the country's society. Thus, the companies with high capital spinning to economic sections which do not substitute the smaller ones spinning. The high capital investments should be done to factories and know-how technology companies because the smaller companies cannot offer the same product and services.

1 Literature Review

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. Moreover, the cases of Serbia and Bulgaria revealed that are above the limit of 0.2 and in general close 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 A.L.P. (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 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. 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 (Abdelkafi, 2018; Z. Acs et al., 2016; Z. J. Acs & Szerb, 2007; Arai, Naito, & Ono, 2018; Cai, 2017; Castaño, Méndez, & Galindo, 2016; Forson, 2020; 'Income taxes, public fiscal policy and economic growth', 2014; 'The East Asian miracle: economic growth and public policy', 1994; Ladvocat & Lucas, 2019; Lajas & Macário, 2020; Oueslati, 2015; Pircher, 2020; Tvaronavičienė, Tarkhanova, & Durglishvili, 2018; Ud Din, Mangla, & Jamil, 2016). 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. 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 (Constantinos Challoumis, 2021a).

2 Methodology

The methodology is that used in the case of Greece, Latvia, Serbia, Bulgaria, and Thailand. Thus, "The calculations of the cycle of money are clarified by the following mathematical types of the work "Mathematical background of the theory of cycle of money":

$$c_y = c_m - c_\alpha \tag{1}$$

$$c_y = \frac{dx_m}{dm} - \frac{dx_m}{da} \tag{2}$$

$$i_{cy} = Y * b_d \tag{3}$$

$$g_{cy\ Country} = \frac{c_{y\ coyntry's}}{c_{y\ Average} + c_{y\ coyntry's}} \text{ or } \frac{i_{cy\ coyntry's}}{i_{cy\ Average} + i_{cy\ coyntry's}} \tag{4}$$

$$g_{cy\ Average} = \frac{c_{y\ Average}}{c_{y\ Average} + c_{y\ Average}} \text{ or } \frac{i_{cy\ Average}}{i_{cy\ Average} + i_{cy\ Average}} = 0.5 \tag{5}$$

The c_m is the velocity of financial liquidity, $c_\alpha$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, $i_{cy\ coyntry's}$ or $c_{y\ coyntry's}$ 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).

The proper 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 Greece is above 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. Eq. (1) is the term of the cycle of money which used to define the $c_{y\ coyntry's}$ and $c_{y\ Average}$ of eq. (2). The cycle of money to a quantity value is expressed by GDP, basically is an expression of $\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S+I+X})}$, according to $\frac{dx_m}{dm}$ and - $\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S'+I'+M})}$ hinged on $\frac{dx_m}{da}$. Then, $c_y = d(GDP) = \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S+I+X})} d(\mathrm{S+I+X})$ - $\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S'+I'+M})}\ d(\mathrm{S'+I'+M})$, formed on $c_y = \frac{dx_m}{dm} - \frac{dx_m}{da}$, of eq, (2). 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: $Y = S_T + I_T + (X - M), or\ Y = (S - S') + (I - I') + (X - M) or\ Y = \Delta S + \Delta I + (X - M)$. According to the theoretical background, 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). Then, $c_{ytotal} = \sum_{i=1}^{n}\sum_{t=1}^{m} c_{yi,t} = \sum_{i=1}^{n}\sum_{t=1}^{m}[\frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S+I+X})} d(\mathrm{S+I+X}) - \frac{\partial(\mathrm{GDP})}{\partial(\mathrm{S'+I'+M})}\ d(\mathrm{S'+I'+M})]_{i,t}$. But, because data from an organization for these activities don't exist follows the application of the index of the cycle of money. 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." (Constantinos Challoumis, 2021c)

3 Results - The case of Slovakia

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 Slovakia's index of the cycle of money using the bank deposits of Slovakia's economy and the GDP per capita of Slovakia's economy. The bank deposits of the global average case and the global GDP per capita are used for the comparison of Slovakia'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:

Tab. 1 Slovakia's OLS analysis

Variable	Coefficient	std. error	p-value
Constant	− −1.29162e+06	69368.5	0.0029 ***
Slovakia's bank deposits	31091.2	2667.72	0.0073 ***
Slovakia's GDP per capita	44.5938	5.02037	0.0124 **
Global index of the cycle of money	−0.115125	0.0650536	0.2188

Source: Challoumis, 2021, author's compilation

In 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 in the case of 0.01 significant level.

The indexes reveal Slovakia'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. The fourth row is expected to be above the 0.1 p-value as the global index of the cycle of money is independent of any country's rate, as in most cases, a country has a very small amount to the aggregate value. Based on those estimations and the theoretical background is determined the condition of the economic structure of the country and if Slovakia belongs to the group of very enhanced economies. According to these results, it's plausible to clarify the condition of the cycle of money in Slovakia:

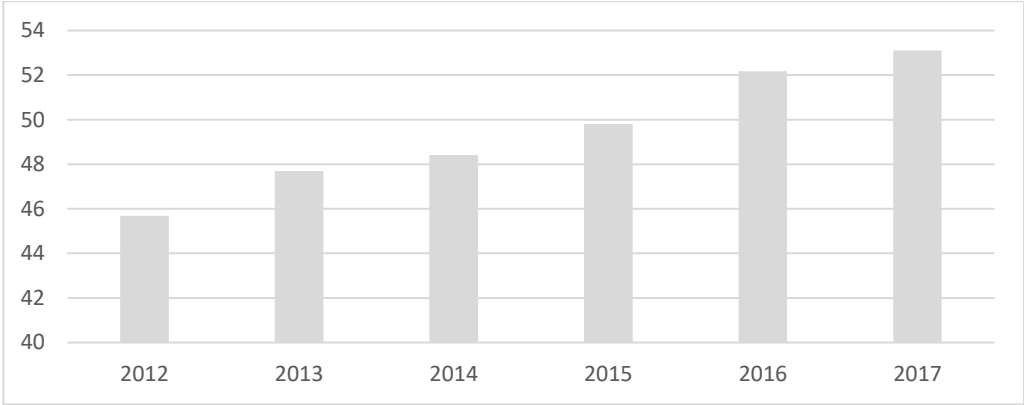
Tab. 2 Slovakia's index of the cycle of money

Year	Bank Deposits Global Average (%)	Bank Deposits Slovakia (%)	Global GDP per Capita ($)	Slovakia's GDP per Capita ($)	Index of Global Average Cy ($)	Index of Slovakia's Cy ($)
2012	52.48	45.69	16,653.01	26,642.48	873,949.96	1,217,294.91
2013	53.96	47.7	17,266.62	26,791.16	931,706.82	1,277,938.33
2014	55.81	48.42	17,159.02	27,472.2	957,644.91	1,330,203.92
2015	59.38	49.81	15,295.71	28,767.6	908,259.26	1,432,914.16
2016	60.77	52.18	15,330.03	29,343.28	931,605.92	1,531,132.35
2017	60.07	53.11	15,082.49	30,189.4	906,005.17	1,603,359.03
RESULTS					**5,509,172.04**	**8,392,842.71**

Source: Globaleconomy.com and Challoumis, 2021, author's compilation

To the next figure is presented Slovakia's bank deposits:

Figure 1 Slovakia's bank deposits

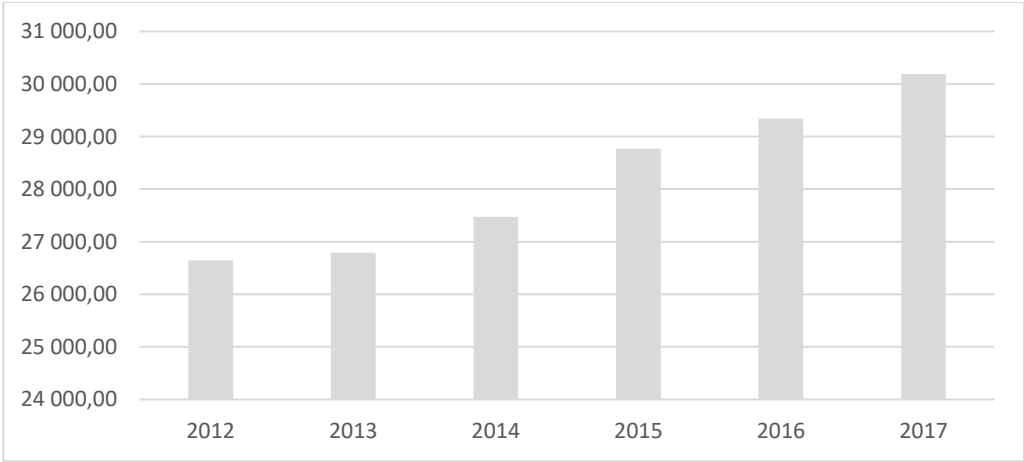


Source: Challoumis, 2021, Globaleconomy.com

To figure 1 shows the situation of bank deposits of Slovakia's financial system, as a percent of GDP, for the period from 2012 to 2017.

The bank deposits are significant for the estimations of the index of the cycle of money, as reflect the distribution and the reuse of money. Then, in the prior scheme, it is obvious that for this period the country bank deposits have increased showing that the distribution and reuse of money have also increased. Then it is expected to have a high general index of the cycle of money. Moreover, the next scheme presented the GDPs of Slovakia:

Figure 2 Slovakia's GDPs per capita



Source: Challoumis, 2021, Globaleconomy.com

Figure 2 presents the condition of GDPs of Slovakia's economy for the period from 2012 to 2017. The GDP per capita of a country's economy is increased for this period. Thus, the amount of money distributed and reused is high.

The expounding of the condition is that both GDP per capita and bank deposits are increased. Hence, the general index of the cycle of money is expected to be high. Also, the next scheme presents the GDPs of Slovakia, for the same period.

According to prior results, the index of Slovakia's c_y is 8,392,842.71 $

We obtain from the prior results that:

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

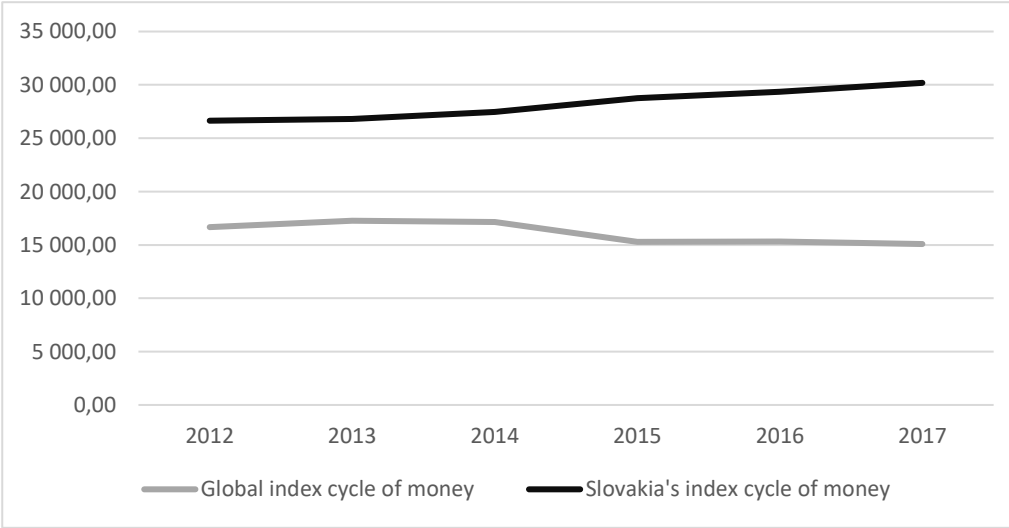
Calculating the general index of the cycle of money for the case of Slovakia and of global view we have that:

The general index of c_y for Slovakia is $g_{cy\ Slovakia} = 0.604$

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

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

Figure 3 Graph of the index of the cycle of money

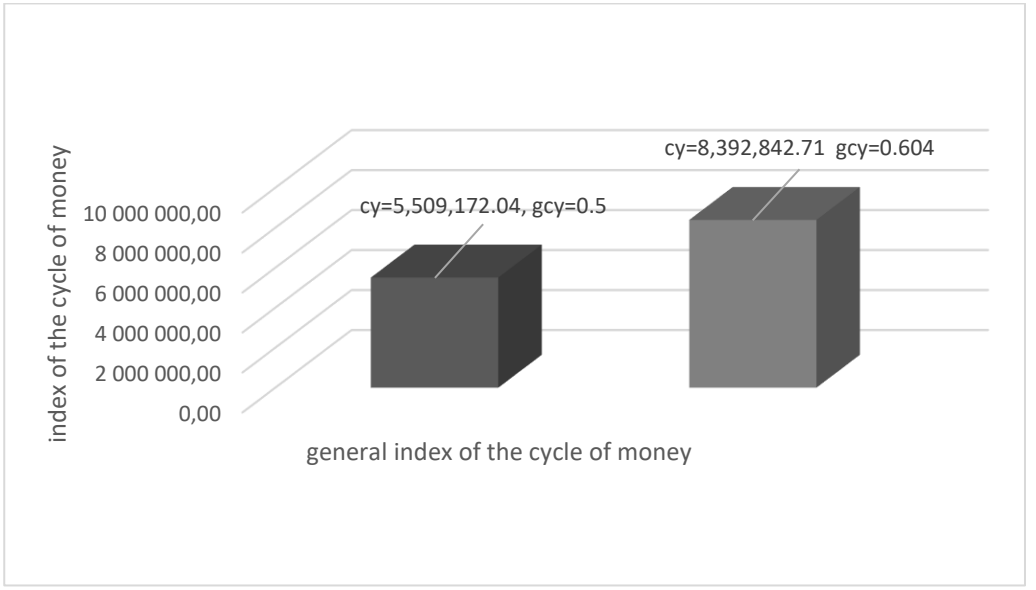


Source: Challoumis, 2021, author's compilation

In pursuance of the prior scheme, it is concluded that the index of the cycle of money of Slovakia's economy is above the global average of the index of the cycle of money, which is 0.5 (considered as a global constant). Slovakia's index of the cycle of money is 0.604. The countries that are near 0.5 have a well-structured economy - standing on eq. (5), according to the theoretical background of the cycle of money. This conclusion means that the economic structure of Slovakia has an upper distribution of money to its economy. Besides, Slovakia could proceed to more reforms, as the international and the bigger companies still substitute the local medium and small enterprises (Challoumis, 2020). 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 transactions of bigger companies (Abate, Christidis, & Purwanto, 2020; Corti, Roldán, & Benito, 2020; Sikka, 2018; Tvaronavičienė et al., 2018).

The general index of the cycle of money appears to the following figure:

Figure 4 The cycle of money indexes



Source: Challoumis, 2021, 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 Slovakia's index. Slovakia is part of the countries which are above the global average index of the cycle of money, both for the simple index and general index. The country's index of the cycle of money, and general index of the cycle of money, is at a very good level, expounding that has a well-formed economic system, with appropriate economic distribution and reuse of money.

4 Discussion

The elucidation of the current results is that Slovakia's financial system belongs to the upper level of the cycle of money, then there has an upper dynamic. But, Slovakia's economy could be improved more. Then, the structure of the economy may be improved, with decrease taxes to the small and the medium companies, and 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. Slovakia's economic system is above the index of common GDP per capita (meaning the value of 0.5), from 2012 to 2017 using the index of average GDP per capita.

The theory of the cycle of money is in the same line with the free competition and the tax policy of the F.L.P. (Fixed Length Principle) among economies. Then enterprises with big capital must invest in factories and know-how goods and services. According to the theoretical background, big capital enterprises substitute products and services that can offer smaller companies. Small and Medium enterprises are the most accurate and quick way to develop the economy of a country, making wider the tax bureau and minimizing allowing in that way to minimize the taxes.

Conclusion

According to the outcomes of the table, Slovakia is above the worldwide average index of the cycle of money. From figure 2 and figure 3 the index of the cycle of money it is revealed Slovakia's distribution of money is to an upper rate. The cycle of money of the country permits a very good distribution of money. The losses of the local banks are to an upper degree. But, the country's economy could be better due to the fact an amount of money is not excluded from the local financial system by worldwide transactions (see table 2). The current model complies with the initial assumption, indicates the distribution of money to Slovakia's economy. Slovakia's economic system has a tendency in the last years to have better reuse of money in the economic system than in the past, as tends to have much better characteristics to a financial system that complies with the idea of the cycle of money. Finally, Slovakia's financial dynamic is over the worldwide average cycle of money, as the value is 0.604 shows that Slovakia's economy tends to have a better distribution of money.

The country's economy is well-formed, then can face any type of economic crisis, in general quickly. But, it is plausible to happen more improvements by an appropriate tax policy. The current decision of G7 for the global minimum tax of 15 % is in that direction, complying with the theory of cycle of money. Along these lines, the companies

which proceed to controlled transactions at least will be taxed by a minum tax, diminishing thusly the lower tax income of the countries, by the reduced spinning of smaller companies by their subbstituion of the big capital and the international companies.

The condition of the A.L.P. follows the concept that companies of controlled transactions can determine the method where they will be taxed. The F.L.P. guarantees that a minimum tax will be paid by companies that proceed to controlled transactions. The F.L.P. of the theory of the cycle of money can be applied also to the tax policy of the country's authorities to the bigger companies which substitute activities oF smaller ones, succeeding in that way higher reuse and distribution of money.

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