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Time-Based Money System

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Absract: The evaluation study is focused on the function of money in management of economic and business processes. We have postulated a daily or yearly time potential of a state as a commodity for its time-based money system. Namely, we have defined a new currency, called a "TBM" (for a Time-Based Money) as a value of the GDP per capita of a specific state divided by the number of minutes per year (525600). We have calculated TBM values for the USA and for the Czech economies in Span of 2011-2015 years. We have found that the TBM is an appropriate tool for comparison of economic performances of individual states and also for evaluating a quality of monetary policy of states and for checking a quality of fulfilling specific tasks by central bank authorities-like the Board of Governors and the Federal Open Market Committee in the USA or the Board of Governors of the Czech National Bank while implementing the monetary policy.

Key words: Fiat money, debt-based money system, value-based money system, fractional-reserve banking, time-based money system, appropriate

INTRODUCTION

Money is a very important tool for management of economic and business processes in various human activities. Money represents/expresses/measures a value of economic entities (i.e., goods, services, resources, labor, debts, etc.), serves as a medium of exchange of valuable entities, it serves for storage of values as a standard of value (or standard of deferred payment) as a unit of account and it has many further important function (Friedman, 2016; Mishkin, 2007). Money has got many forms, like a (physical) commodity money, representative money, paper money, banknotes/gold standard notes, coins, counterfeit money, fiat money (which value is guaranteed by a government order), bank money, alternative/complementary money and other forms (Friedman, 2016). The fiat money (Mishkin, 2007) which is prevailingly used nowadays in economy, business and everyday life is not tied to any "firm" or material value like gold for many years served. Instead, the amount of money in an economy and thus, its value is regulated by governments and central banks or by other monetary authorities on the basis of a declared monetary policy. The main problem is that the modern money systems are prevailingly debt-based instead of value-based. In our previous contributions (Kala, 2014) we have shown that the last global economic crises was caused rather by failure of the managerial and government authorities responsible for the monetary policy implementation than by the lack of theoretical knowledge of modern economic relations and processes. It is obvious that conventional money systems based on a fiat money together with the fractional reserve banking and a central issuance were and still are at the root of recurring economic and social problems (Bernanke, 2009; Classens and Kose, 2014; Anonymous, 2013; Ng and Wright, 2013; Anonymous, 2014; Anonymous, 2014; Anonymous, 2014; Anonymous, 2014; Anonymous, 2014a-f).

We have also picked up some aspects of alternative complementary currencies based on time (Mishkin, 2007), like, so called Time Dollar, Time Credits, Service Credits "Minuto" time vouchers (Anonymous, 2014) and the Occupy money. They showed their viability in a branch of services so far. However, these currencies value mostly everyone's contributions equally: one hour equals one service credit, regardless of the service provided in one hour or how much skill is required to perform the task during that hour. In spite of the fact that we have at disposal nowadays capable ICT technologies for detailed assessing of the values of economic subjects, processes, raw materials and machinery used (including the values of past labor, land, environmental, capital, etc.) in time based units, it would be tedious and very complicated to evaluate all the factors well in a daily monetary practice. That is why, we have designed usage of a "daily" or "yearly" time potential as a commodity for time-based money systems as it is objective, predictable, dynamically evolving and has further prospective positive features.

MATERIALS AND METHODS

The evaluation study is based on the method of qualitative analysis of secondary data and information available on the function of money in modern economy. It has a pre-formative character on thinking about needs and possibilities for creating a stable and objectified monetary and banking system.

Table 1: Population, values of the GDP, GDP pc and the TBM in current US$ for the United States of America and for the Czech Republic in Span of 2011-2015 years

	The United States of America				The Czech Republic			
Year	Population	GDP*	GDP p.c. in US$	TBM in US$	Population	GDP**	GDP pc in US$	TBM in US$
2011	312996873	15518	49781.8	0.0947142	10505445	227313	21656.9	0.0412041
2012	315382827	16155	51433.0	0.0978558	10516125	206442	19640.9	0.0373685
2013	317773895	16663	52660.3	0.1001908	10512419	208328	19813.9	0.0376977
2014	320282544	17348	54398.5	0.1034979	10538275	205270	19502.4	0.0371050
2015	322755353	17947	55836.8	0.1062344	10553843	181811	17231.3	0.0327841

GDP* in trillion current US$, GDP** in billion current US$ Own, using data of the World Bank (2016) and data of the Czech statistical office (CSO., 2016)

That is why, we have defined a new currency called a "TBM" (for Time-Based Money) as a value of the GDP per capita divided by the number of minutes per year (i.e., 525600). We have calculated TBM values for the US and the Czech economies for Span of 2011-2015 years. We used the data taken from the World Bank, International Comparison Program database (World Bank, 2016), the US Census Bureau, the Czech National Bank (CNB., 2016) and the Czech Statistical Office (CSO., 2016).

Time-based money system: The principal issue of our work was defining the "daily" or "yearly" time potential of economic subjects, namely countries/states as a commodity for their time-based money systems. Our reasons for this decision were as follows: everybody has at disposal just 24 h or 86400 seconds total in a day; this feature can be a firm foundation, or "commodity", for a valuable time-steady money system as an hour is 3600 sec today and will be the tomorrow and in future, time (namely the life time) is the most precious value in the world which is not a subject of inflation time and specifically the labor time is a specific commodity whose value is extraordinary per se, an amount of the labor time of a country/state is in a direct correlation with an increase or decrease of its population, this feature can be used as a very useful measure or as a natural regulator for the money supply of a currency of the countries or states, the amount of the labor time total is at disposal to countries/states (or broadly speaking mankind) for managing all the emerging challenges, possibilities, opportunities, threads and other circumstances coupled with the increasing or decreasing number of population; the quality of the time-based currency could reflect/differ/measure a quality of managerial processes, effectivity, efficiency, productivity as well as an influence of geographical, demographical, natural, political and others factors in different places and historical on real economic processes.

In this research, we have tested a usefulness of one of the potential functions of the Time-Based Money (TBM) in an evaluation of economic development, namely the GDP development of the United States of America and of the Czech Republic in Span of 2011-2015 years.

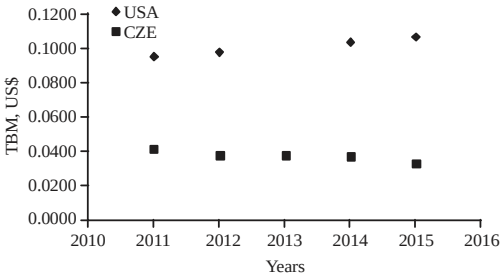

Fig. 1: The tendencies in the development of the TBM in current US$ in the United States of America and in the Czech Republic in Span of 2011-2015 years (Own, using data of the World Bank (2016)

In Table 1, there are given numbers of population, values of the GDP, GDP per capita and the TBM in current US$ for the United States of America and for the Czech Republic in Span of 2011-2015 years. It can be seen from Table 1 that the number of population and the value of GDP in UD$ created yearly in the USA were considerably greater (nearly 30 times in population and more than 80 times in GDP) than in the Czech Republic. Also the values of the GDP per capita in US$ were about 2.7 times greater than those reached in the Czech Republic.

It is also obvious from the Table 1, that 9.47 cents were added to the GDP pc of the USA during every minute of the life of each of the American inhabitants in 2011 and that the value increased systematically to 10.62 cents in 2015. In the Czech Republic the value added to the GDP pc of the Czech Republic budget during every minute of the life of every Czech inhabitant was US¢ 4.12 in 2011 and 3.28 US cents in 2015. The ratio between the values of the GDP pc and consequently between the TBM for the Czech Republic and these for the USA was decreasing in the Span of years 2011-2015, namely, from the 43,5% in 2011-30,9% in 2015.

In Fig. 1, there can be noticed the tendencies in the development of the values of the TMB expressed in current US$ of the United States of America and of the Czech Republic in the Span of 2011-2015 years. The value of the TBM was growing in the USA in that Span

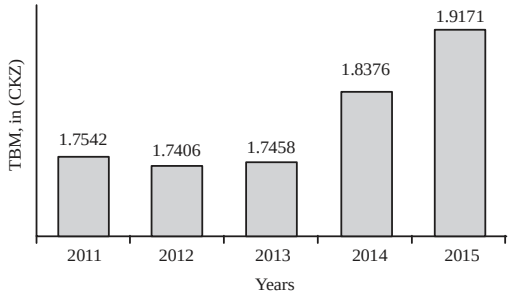

Fig. 2: The development of the TBM in CZK (in the Czech Crown) derived from the production side of the Czech Republic Budget in Span of 2011-2015 years (CSO., 2016)

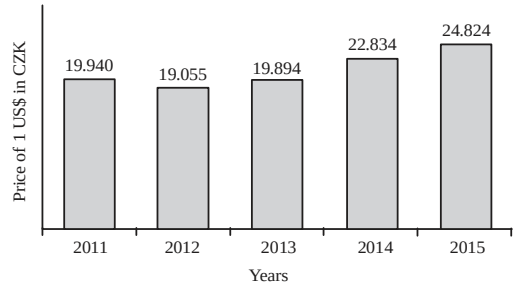

Fig. 3: The development of the US$/CZK Currency Ratio in Span of 2011-2015 years (Own, using data of the Czech National Bank (2016)

of time. On the contrary, the value of TBM decreased in the Czech Republic. The tendencies described seemed to be in conflict with the real Czech economy development in the Span of 2011-2015 years which is displayed in the Fig. 2.

In Fig. 2, there is visualized the development of the TBM in CZK which was calculated from the production side of the budget and a number of population of the Czech Republic in Span of 2011-2015 years. The tendency is completely different than that in Fig. 1 (which was expressed in current US dollars). In Fig. 3, there are introduced graphs which shows the fluctuations of the value of the Czech Crown in relation to US$ in Span of 2011-2015 years.

RESULTS AND DISCUSSION

It can be derived from the data from Table 1 and Fig. 1 and 2 that the increase in the GDP and the growth of population are directly proportional to time in Span of 2011-2015 in the USA. That is why the TBM (in US$) is also proportional to time. In such conditions, the TBM or TBM-US$ could be used readily in practice. Maybe, even for evaluating/checking that the Board of Governors and the Federal Open Market Committee fulfill their tasks, i.e., "to promote effectively the goals of maximum employment, stable processes and moderate long-term interest rates" (BGFRS, 2016), reasonably well.

The extent of the Czech economy and the number of population in the Czech Republic are considerably smaller-in comparison with the USA ones (see the figure in Table 1). The GDP (in US$) and the TBM (in US$) of the Czech Republic was decreasing in the Span of 2011-2015 years (see Fig. 1). These tendencies are is in conflict with the development of real Czech economy. The economy suffered some decrease because of aftermath of the global economic crisis in 2011-2012, however, it recovered considerably during the 2013-2015 years. It is reflected by the development of the TBM (in CZK) derived from the production side of the Czech Republic budget which is shown in Fig. 2.

The picture/tendency of the development of real Czech economy in US$ was distorted in our view by setting the US$/CZK currency ratio by the Czech National Bank Board in Span of 2011-2015 years Fig. 3).

CONCLUSION

Money is a very important tool for management of economic and business processes of human activities. Our temporary money is influenced by a bank practice of the fiat money and of the fractional-reserve banking which create speculative money in exponentially expanding measures and the volatility, particular political interests, corruption, managerial failures and other negative phenomena. It can seriously damage or even destroy the existing global economic system in recurring crises. That is why Money deserves a good modern theory and practice based on actualized resource theories of value.

In this research, we have defined the "daily" or "yearly" time potential of economic subjects (countries/states) as a commodity for their time-based money systems. Namely, we have defined a new currency called "TBM" (for Time-Based Money) as a value of the GDP per capita divided by the number of minutes per year (i.e., 525600).

We have found that the TBM (or the TBM-US$) can be used readily in practice in the USA, also for evaluating/checking the quality of fulfilling the monetary policy by the Board of Governors and the Federal Open Market Committee fulfill their tasks, properly.

On the other hand, we have identified strong distortion of the real Czech economy outcomes expressed in US$ in comparison with outcomes expressed by means of the TBM in CZK. According to our opinion, it was caused by the incorrect setting of the US$/CZK currency ratio by the Czech National Bank Board in Span of the 2011-2015 years.

The monetary policy of the Czech National Bank Officers is in our mind too much focused of the keeping the CZK as weak as possible for creating "amiable" conditions for lagging companies on international market and boosting an inflation rate to a higher level than it is realistic and necessary to ensure full employment, stable processes, moderate long-term interest rates and prosperous Czech economy. It is obvious that this supposition should be extended and tested using adequate set of data and facts.

We conclude with a message: "Time is a prospective base/commodity for a new money system which would be objective, predictable, dynamically evolving and readily introduced in economy, business and everyday life". It is worthwhile to test this idea thoroughly.

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