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**COVID 19 and its Impact
on Money Multiplication and Money Supply**

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Abstract

At the end of 2019 the world was shaken by a virus, named COVID 19, from the city of Wuhan, Hubei, China. This virus was officially categorized as a pandemic by the World Health Organization, because of its uncontrolled spread throughout the world. Until now, COVID 19 spread to 215 countries in the world with more than 15 million cases. All countries have implemented the lockdown.

The pandemic impacts all sectors of economy, including banking. The research investigates the impact of pandemic on money multiplication in the banking system. The pandemic led to 45% decrease in usage of cash and 60% withdrawals in the world. At the same time, an increase in online shopping and online payment by 72% was noticed. The effect was to reduce the cash in the economy. The money multiplier will change by supplying less cash in the economy. When it will increase, the money multiplication will accelerate. The change of spread of this multiplication will increase the money supply in economy. As it is known, for the recovery of economy, more monetary and fiscal instruments should be made available. The accelerated multiplication in real terms will increase money supply. It will affect the economy in the same way as the tools of the Central banks for the accomplishment of the expanding monetary policy.

Keywords: COVID 19, monetary policy, banking, money multiplier, money supply.

JEL Classification: C20, E51, E52, G21

1. Introduction

At the end of 2019, the world had been shaken by a virus, named COVID 19, from the city of Wuhan, Hubei, China. This virus was officially categorized as a pandemic by the World Health Organization, considering the uncontrolled spread

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throughout the world. Until now, COVID 19 spread to 215 countries in the world with more than 15 million cases. All countries have implemented the lockdown.

The COVID 19 pandemic dramatically impacts on human lives and the economies. The extensive spread has become catastrophic to the global economy, causing strong damage to the global production and supply chains. These changes influence the economy of countries such as Bulgaria, because:

- demand for goods, raw materials and services from developed countries is decreasing;
- delays in the delivery of necessary components from more technologically developed countries are disrupting the value chains;
- other factors - restriction of movement of goods, services and people, inability to reach workplace or the financial limitations, which affect the normal production process.

The quarantining measures during the first wave of the pandemic have accelerated an economic downturn, affecting not only global production and supply, but also international trade, foreign direct investments, international financial markets, and international tourism and travels and at national level – monetary supply, budget spending and government debt.

2. Problem Statement

2.1 Specific monetary conditions in Bulgaria by the Currency Board

The monetary institution in Bulgaria is not the Central Bank. In 1997, the Currency Board was introduced. By the Currency Board there is no active monetary policy implemented. The monetary institution loses more of the instruments by such policy. In the case of Bulgaria, it keeps only the minimum required reserves. The changes in money supply depend on the market forces and follow the same as money demand (Assenova, 2013[3]).

The fluctuation of the economic activity is not significant. The more important instrument for influencing the economic growth is a fiscal policy.

Through the works of the Currency Board, the monetary base and money supply depend on the market forces. They adapt to the changes in the balance of payment at any given time. The mechanism of growth of money supply is different in terms of banking system implemented by the Central Bank from that of the Currency Board. Through the works of the Central Bank, in the banking system, the growth of the reserve money is usually associated with an increase in net domestic assets due to the purchase of government debt or lending to commercial banks. The Bulgarian version of the Currency Board differs from the typical one. The differences in comparison with the standard mechanism of money supply under a Currency Board are as follows:

- The main feature of the Currency Board in Bulgaria – one of the Departments in the former Central Bank, provides the coverage for the monetary liabilities with foreign reserves of the Bulgarian National Bank (BNB) except those form the

international financial institutions. The standard approach provides coverage only for the available local currency;

- The control of money supply by the Currency Board in Bulgaria depends on the fiscal policy. It could be omitted by the politics by using intense fiscal reserve, because this element is a significant part in the liabilities of the Issue Department.

2.2 Literature review – COVID 19 and its impact on the economy

The literature on the economic impacts of the COVID-19 pandemic has been growing during the last months. There are few studies about the economic loss due to influenza as the research of Schoenbaum, (1987[17]). Meltzer and Cox (1999[14]) examined the potential macroeconomic impacts of the influenza pandemic in the US. They estimated that the mean total economic impact for the US economy is \$73.1-\$166.5 billion. The research on the economics of COVID-19 just started. There are also many works, based on the previous experience, bringing real-time data, and intuitive and policy perspectives from IMF, BIS, World Bank, OECD, UNCTAD. Only Beck (2020[6]) focuses on finance and banking risks created by the pandemic and argues that the effect would depend on three factors – the extent of the economic effects of the pandemic at global level, the fiscal and monetary policy reactions to the shocks, and regulatory reactions addressing possible bank fragility. Most of authors focus on supply or demand chains and their changes. The money multiplication and money supply are not in the topics until now.

2.3 Monetary measures after COVID 19 pandemic

Table 1. Monetary measures after the COVID 19 pandemic

Country	Rate cut	Current rate %	Credit and liquidity measures	Macro-financial measures
Bulgaria	-	-	-	<ul style="list-style-type: none"> • BGN 7bn liquidity support through banking systems (6% of 2019 GDP); • Allocation of BGN 800mn to provide guarantee/credit to SMEs; • Allocation of BGN 418mn for long-term investment and working capital financing; • BGN 200mn to provide interest-free loans to employees on unpaid leave.

Country	Rate cut	Current rate %	Credit and liquidity measures	Macro-financial measures
Poland	100bp	-	Reduced the required reserve ratio by 300 bps to 0.5%.	<ul style="list-style-type: none"> • Purchased Polish Treasury securities in the secondary market; • Repealed 3% systemic risk buffer for bank capital requirements; • Introduced a funding programme for bank lending to non-financial private enterprises.
Romania	50bp	2.0	Provided liquidity to credit institutions via repo transactions.	<ul style="list-style-type: none"> • Purchased government securities on the secondary markets; • Facilitated operational measures to smooth the functioning of payment settlement.
Russia	50bp	5.5	<ul style="list-style-type: none"> • Sold FX reserves from the National Welfare Fund; • Introduced temporary regulatory facilities for banks to help corporate borrowers. 	<ul style="list-style-type: none"> • A new facility of RUB 500bn for SME lending; • Reduced Deposit Insurance Fund contribution from 0.15 percent to 0.1%.
Turkey	200bp	8.75	<ul style="list-style-type: none"> • Longer-term instruments at discounted rates; • Reduced the reserve requirements on foreign currency deposits by 500 bps. 	<ul style="list-style-type: none"> • Introduced lending facility for SMEs in the export sector; • Purchases of sovereign bonds; • Reduced the minimum payment for individual credit cards to 20%.

Source: adapted from Sarker (2020[16])

3. Aims of the Research

All countries in the world have taken measures which, if implemented successfully, are predicted to minimize the impact of the crisis after COVID 19 and to stabilize the economies. The instruments used could be monetary and fiscal. The monetary instruments are easy to use for the recovery of the economy. The research investigates the changes in the monetary multiplier and money supply in the Bulgarian economy. Because of the reduction in cash and the increase in online shopping, it is suggested that, as in other countries in the world, the money multiplier to be reduced and the money supply to rise, which will ensure short-term recovery of the economy after the COVID19 pandemic.

4. Research Methods

The achievement of key targets and the realization of the main aim of the study are accomplished by a systematic theoretical-empirical approach. In particular, this approach is realized through the following:

- Induction and deduction in the research of the facts characterizing the money multiplier, reserve base and money supply before and after the COVID 19 pandemic;
- Comparative analysis of all main variables above before and after the COVID 19 pandemic.

The chosen instruments for achieving the main objectives of the study are extensive statistical data. The data are illustrated with graphics and text application.

The conclusions of the research are based on the results of calculation of main variables before and after pandemic and feedback analysis.

5. Findings

5.1. Reserves of the monetary institution before and after the COVID19 pandemic

The variable determines the volume and the active put into practice of the monetary instruments depends on the Reserves of the Bulgarian National Bank (BNB). In figure 1 are presented the Reserves of BNB and their structure one year before the pandemic and during the pandemic.

BNB disposes from enough reserves to use all appropriate monetary instruments accordingly, in the opinion of the Government Body of the National Bank, and to make strong efforts for the recovery of the Bulgarian economy.

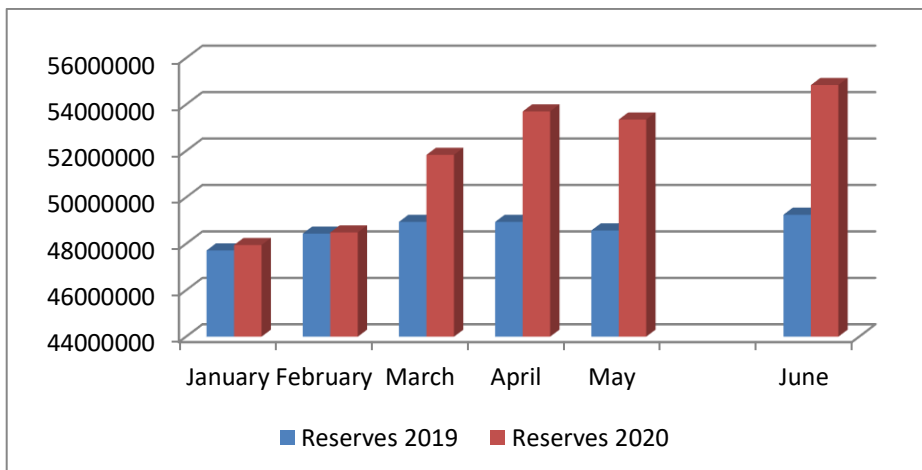


Figure 1. BNB Reserves Balance Sheet 01-06/2019 and 01-06/2020 (thousand BGN)

Source: Monthly Balance Sheets of BNB Issue Department

5.2. Money multiplier and money supply before and after the COVID 19 pandemic

As it is known, the money multiplier depends on three ratios: Cash/Deposits (C/D), Exceeded Bank Reserves/Deposits (ER/D) and Required Reserves/Deposits (rd).

The money multiplier is calculated according to the formula below:

$$\frac{1 + \frac{C}{D}}{\frac{C}{D} + \frac{ER}{D} + rd} \quad (1)$$

The Required Reserves/Deposits ratio in Bulgaria is 10% (BNB, 2016), excluding local and central budget accounts. In this case, it is 0%. The reserve base is the attracted funds of the banks in BGN and foreign currency, with the exception of the funds attracted from other banks and the branches of foreign banks with registered office in the country.

Since September 2019, the BNB applies an interest rate on the excess reserves of banks (BNB, 2016) in the amount of -0.70% due to the reduction in the interest rate on the ECB deposit facility by 10 basis points to -0.50%. The BNB aimed to decrease the maintained excess reserves on BNB accounts. Before the COVID 19 pandemic, exceed reserves reduced sharply. After the onset of the health crisis, the Exceeded Reserves/Deposits ratio increased two times. On the one side, the banks accumulated funds not possibility to invest during the lockdown. On the other side, it shows that some of the measures, introduced from the Government in the banking sector, are not working effectively.

Table 2. Exceeded Reserves/ Deposits Ratio

(%)	01.2019	02.2019	03.2019	04.2019	05.2019	06.2019
	8.16	7.98	8.43	8.30	7.00	6.11
ER/D	01.2020	02.2020	03.2020	04.2020	05.2020	06.2020
	4.73	4.15	8.55	9.13	8.80	10.20

Source: Bulgarian National Bank - Statistics – Brief Monetary Report and own calculations

The pandemic led to 45% decrease in usage of cash and 60% withdrawals in the world. At the same time, an increase in online shopping and online payment by 72% was noticed. The effect was to reduce the cash in the economy. This could change the Cash/Deposits ratio. Below is the same ratio for Bulgaria before and after the COVID 19 pandemic. In Bulgaria, no negative trends in the money/deposits ratios or reduction in cash was noticed. Instead, it impacts negatively on the money multiplier and money supply.

Table 3. Cash/Deposits Ratio

(%)	01.2019	02.2019	03.2019	04.2019	05.2019	06.2019
	19.52	19.38	19.32	19.40	19.68	19.97
C/D	01.2020	02.2020	03.2020	04.2020	05.2020	06.2020
	20.01	19.47	19.78	19.91	19.84	19.91

Source: Bulgarian National Bank - Statistics – Brief Monetary Report

Table 4. Money multiplier

	01.2019	02.2019	03.2019	04.2019	05.2019	06.2019
	3.172	3.196	3.160	3.167	3.263	3.326
m	01.2020	02.2020	03.2020	04.2020	05.2020	06.2020
	3.455	3.553	3.125	3.072	3.101	2.989

Source: Bulgarian National Bank - Statistics – Brief Monetary Report and own calculations

Two of all three ratios, included in the calculation of money multiplier, have changed. As it is written above, they lead to the reduction in the money multiplier. In turn, it impacts on the money supply. Its expanding could be turning the economy to the pre-pandemic level very quickly. This volatility of money multiplier does not have this advantage of monetary instruments.

By the works of the Currency Board, the monetary base and money supply depend on the market forces. The monetary base changed positively compared with the period before the COVID 19 pandemic. The first month after lockdown – March 2020 – it increased sharply by 13.33% and it rises every month. Only in the third month of lockdown, its level was similar to that of previous months.

Table 5. Monetary base

01.2019	02.2019	03.2019	04.2019	05.2019	06.2019
30976349	31025585	31539396	31539396	30696250	30226757
01.2020	02.2020	03.2020	04.2020	05.2020	06.2020
30977665	30260276	34295480	35290938	35315996	36556856

Source: Bulgarian National Bank - Balance sheets of Issue Department

The changes in the money multiplier and monetary base are reflected in different directions. But for the period of lockdown, the money supply raised in a very small pace from 0.68% for the first month of lockdown to 0.13% in June 2020. In the case of Bulgaria, the money multiplier and money supply did not impact effectively on the economy and hamper the recovery of the economy.

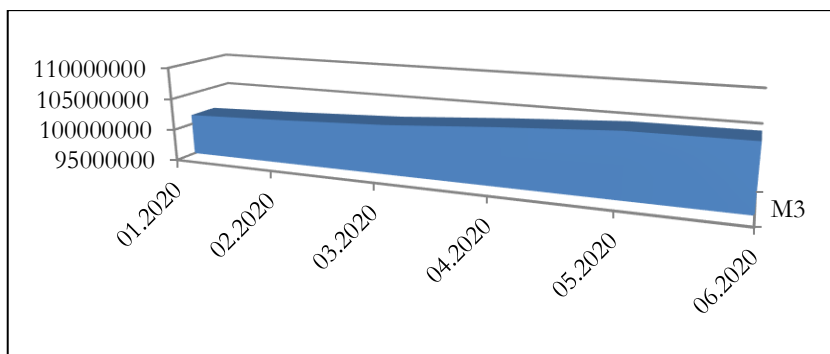


Figure 2. M3 for the period 01-06/2020 (thousand BGN)

Source: Bulgarian National Bank - Brief Monetary Report

6. Conclusions

At the end of 2019 the world was shaken by a virus, named COVID 19, from the city of Wuhan, Hubei, China. This virus was officially categorized as a pandemic by the World Health Organization, because of its uncontrolled spread throughout the world. Until now, COVID 19 spread to 215 countries in the world with more than 15 million cases. All countries have implemented the lockdown.

The quarantining measures during the first wave of the pandemic have accelerated an economic downturn, affecting not only global production and supply, but also international trade, foreign direct investments, international financial markets, and international tourism and travels and at national level – monetary supply, budget spending and government debt.

Since 1997, the monetary institution in Bulgaria is the Currency Board. By the Currency Board there is no active monetary policy implemented. The monetary institution loses more of the instruments by such policy. In the case of Bulgaria, it keeps only the minimum required reserves. The Required Reserves/Deposits ratio in Bulgaria is 10%. The pandemic led to 45% decrease in usage of cash and 60% withdrawals in the world. At the same time, an increase in online shopping and online payment by 72% was noticed. The effect was to reduce the cash in the economy. This could change the Cash/Deposits ratio. In Bulgaria, no negative trends in the money/deposits ratios or reduction in cash was noticed. Instead, it impacts negatively on the money multiplier and money supply.

Before the COVID 19 pandemic, exceed reserves reduced sharply. After the onset of the health crisis, the Exceeded Reserves/Deposits ratio increased two times. On the one side, the banks accumulated funds not possibility to invest during the lockdown. On the other side, it shows that some of the measures, introduced from the Government in the banking sector, are not working effectively. The monetary base changed positively compared with the period before the COVID 19 pandemic. The first month after lockdown – March 2020 – it increased sharply by 13.33% and it rises every month. The changes in the money multiplier and monetary base are reflected in different directions. But for the period of lockdown, the money supply raised in a very small pace from 0.68% for the first month of lockdown to 0.13% in June 2020.

The main goal of the economic policy after the COVID 2019 pandemic aims at the recovery of the economy. It requires that all instruments for influencing on the aggregate supply to be found. This purpose could be achieved with monetary and fiscal instruments. The current research investigates the change in the money multiplier and money supply for the economic growth to be stimulated. For the first months of lockdown in Bulgaria, the monetary instruments were not effective for the quick recovery of the economy up to the pre-crisis level.

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