

ANTI-CRISIS MACROECONOMIC POLICY IN THE CONDITIONS OF COVID-19 IN BULGARIA

Any anti-crisis macroeconomic policy includes monetary and fiscal policy. The construction of anti-crisis macroeconomic policy in the conditions of a small open economy in a currency board and a virus pandemic raises the question of which measures should be the foundation and which measures should play a complementary macroeconomic role. This issue is extremely important because it predetermines both the efficiency and effectiveness of counter-cyclical policy. This study deals with the structuring of the main and complementary role of the fiscal and monetary policy in the general anti-crisis policy of Bulgaria. The focus is on 2020, looking at the impact of aggregate fiscal multiplier and monetary measures on GDP, based on extrapolation. A mathematical analysis is realized, which leads to quantitative results that illustrate the impact of fiscal and monetary policy on GDP development in a predictable short-term period which covers 2020 on a quarterly basis.

JEL: E6; E62; E52

1. Introduction

The socio-economic system of Bulgaria in the second quarter of 2020 entered a "new" reality, which is determined in the conditions of COVID-19. In this situation of ambiguity and uncertainty in the field of health care, an epidemiological emergency was introduced as a result of a political decision. This political decision, which was provoked by the shock in the health system, reproduced an unprecedented supply shock that induced an economic downturn in GDP dynamics. This supply shock is transformed into a decline in consumption and induces a demand shock. Thus, the Bulgarian economy began to move towards an economic crisis that combines systemic, individual, economic, health and political risks that arise in the conditions of global, regional and national generality and uncertainty caused by COVID-19.

The main reason for the economic crisis is the delayed coordination of social distance policy with specific economic policies. The outbreak of the COVID-19 pandemic in China was registered in 2019. It was registered in Bulgaria in mid-March 2020. Therefore, the political

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inactivity and the delay of coordinated and simultaneous actions of health and economic measures led to a supply shock from the delayed restructuring of the economy and adjustment of functioning in conditions of social distance. The economic shock of supply is hitting the Bulgarian economy hard, as the Bulgarian economy is mainly an economy of tourist and restaurant services. Accordingly, sectors that provide a large part of employment are affected. Sectors such as light industry need to be restructured, which is delayed and thus reproduces cyclical unemployment, which is combined with forced unemployment and aggregate consumption is reduced. Thus, demand became the main cause of the economic crisis in Bulgaria.

In these conditions of economic collapse, a strategically correct anti-crisis macroeconomic policy should be built which can correspond to the causes of the crisis. That is why **the main goal** in the present study is to argue quantitatively the rational and effective anti-crisis macroeconomic policy. An anti-crisis policy must include both fiscal policy and monetary measures. It is noteworthy here that the anti-crisis policy to be constructed in Bulgaria will contain fiscal policy and monetary measures, not monetary policy, as in the conditions of a currency board the actions of monetary policy are limited, but it is possible to apply monetary measures, such as targeted lending which does not require the payment of interest for a certain period of time.

It has been historically proven that anti-crisis macroeconomic policies involve a combination of fiscal and monetary policy instruments. In recent years, it has been argued that it is more favourable to use the instruments of monetary policy as the main one, because according to classical theory, the state should not interfere in the economy, while fiscal policy should be complementary. As the monetary policy in case of recession gap takes the form of quantitative reliefs, and in case of inflation gap and in case of economic recovery, it takes the form of the so-called inflation targeting. However, the intuitive economic logic leads to the **thesis** defended in this publication that in an economic crisis caused by government decisions, in which the main problem is to increase demand, then the basis of the anti-crisis macroeconomic policy should be fiscal monetary measures and a complementary and auxiliary instrument and together to participate in the counter-cyclical strategy for overcoming the economic consequences of COVID-19.

The argumentation of the thesis is achieved through mathematical analysis based on extrapolated values of GDP, consumption, imports, government spending, money in circulation, loans, the velocity of money for those missing in the second, third and fourth quarters in 2020. The period covered by the survey is from the first quarter of 2019 to the fourth quarter of 2020, with the emphasis on the period from the first to the fourth quarter of 2020. Data sources are NSI and BNB statistics, which are completely homogeneous.

2. Literature Review

The idea of a targeted counter-cyclical macroeconomic policy to regulate the trade cycle was first developed by Keynes (1991). The regulation of the trade cycle in Keynes's theoretical construction is realized by promoting consumption through investments which are realized by the state and which are the core of the anti-crisis macroeconomic policy. According to

him, the main tool in crisis management is fiscal policy. Keynes (1991) views monetary policy as supporting to and complementary to fiscal policy. He rightly points out that the interest rate, as the main instrument of monetary policy, is effective in conditions of an inflationary gap, but its effectiveness decreases significantly in conditions of recessionary gap. Examining and analyzing the impact of interest rates on the trading cycle, Keynes (1991) does not deny the use of interest rates in a recessionary phase, but argues that lowering interest rates is not enough to stimulate a simultaneous increase in the margin on effective capital and propensity to consumption, which is a prerequisite for controlling and overcoming the recession and depression in the trade cycle. This logical perspective, followed by Keynes (1991), leads to the thesis that monetary policy is complementary to fiscal policy and, respectively, the interest rate is an auxiliary anti-crisis macroeconomic instrument, as its dynamics is predominantly asymmetric to the dynamics of consumer and investment attitudes, especially in economic turbulence. Following the same logic, Keynes (1991) sees the reasons for the emergence and deepening of demand crises, which depend on the propensity to consume and invest. The propensity to consume is associated with the level of employment as an indicator and goal of anti-crisis policy, in addition to economic growth measured as GDP. From this, it is already clear that the stimulation of employment can be realized most effectively with the application of discretionary fiscal policy, which in turn is realized through the mechanism of the investment multiplier, which in Keynes's theory is a relationship between aggregate investment and income, which is measured as real wages. Stimulating employment in times of crisis can be done most effectively through fiscal policy, because it creates real income, not nominal income, which is a prerequisite for maintaining the level of employment at a level that does not create a deepening crisis and does not cause social shocks and catastrophes. Therefore, in his views, Keynes (1991) argues that tax policy, monetary policy, and fiscal policy must interact and reduce inequalities, which are intensify, especially in times of crisis. Of course, the primary anti-crisis measure is the action of the expenditure multiplier, which, however, must be supported by the effects of the tax and monetary multiplier.

Mundell (1962) argues that the instrument of macroeconomic policy must be determined by the macroeconomic goal and the type of crisis. He writes: *"It has been demonstrated that, in countries where employment and balance of payments policies are restricted to monetary and fiscal instruments, monetary policy should be reserved for attaining the desired level of the balance of payments, and fiscal policy for preserving internal stability under the conditions assumed here. The opposite system would lead to a progressively worsening unemployment and balance of payments situation."* (Mundell, 1962, p. 76).

From what has been written, it is clear that fiscal policy is effective when the goal is to achieve a balance between supply and demand in the internal market, and monetary policy is effective when the macroeconomic goal is to balance the balance of payments and achieve external balance. Another conclusion that can be drawn from the developed thesis of Mundell (1962) is that macroeconomic policy, which must be implemented in times of crisis, is a mix of fiscal and monetary policy, the basis of which is fiscal policy, because, in conditions of recessionary gap, the emerging internal imbalances must first be controlled, and the management of external shocks affecting the external equilibrium is a subsequent anti-crisis step.

According to Modigliani (1977), stabilization macroeconomic policy is needed to manage liquidity and preferences, as well as the lack of flexibility in the labour market resulting from rigidity wages. The firmness of prices, even in conditions of flexible wages, would disrupt the synchronicity between supply and demand, because there will be a mismatch between the nominal and real price and wage dynamics as a consequence of declining demand, which will require a new balance of employment and output, which in the short term can be realized only through the implementation of a stabilization policy. Stabilization policy is needed firstly to stabilize prices through monetary policy and, secondly, to stabilize employment through fiscal policy. The author develops the thesis that only the use of monetary policy to stabilize the money supply is not effective and will not be able to regulate the trade cycle, but on the contrary will create conditions for alternating recessionary, inflationary and stagnant cyclical phases. The functioning of the complex mechanism of the economic system, including variable prices, employment, interest rates and money, depends on a complex stabilizing mechanism, which includes monetary and fiscal policy. He states: "*Monetary policy could change the nominal supply of money so as to accommodate the change in real demand resulting from shocks in aggregate demand. Fiscal policy, through expenditure and taxes, could offset these shocks, making full employment consistent with the initial nominal money stock. In general, both monetary and fiscal policies could be used in combination. But because of a perceived uncertainty in the response of demand to changes in interest rates, and because changes in interest rates through monetary policy could meet difficulties and substantial delays related to expectations (so-called liquidity traps), fiscal policy was regarded as having some advantages*" (Modigliani, 1977, p. 2).

Fiscal policy and the mechanism of the investment multiplier are the core of the anti-crisis macroeconomic policy, as well as the tax policy when the effective aggregate demand shrinks. Therefore, if the crisis is characterized as a recessionary gap combined with deflation, provoking inflation would be a positive sign of economic recovery.

Snowdon et al. (2005) analyze the impact of fiscal and monetary policy in a small open economy with a fixed exchange rate. They assume that in addition to a fixed exchange rate, the economy has perfect capital mobility and in the long run income moves around its equilibrium point. The conditions thus described are a prerequisite for the conduct of fiscal policy, which will be highly effective, while monetary policy will be ineffective. They even argue that under these conditions, increasing government spending will not drive out private investment.

Blanchard (1987) argued that monetary policy with a low hardness of nominal variables would allow monetary policy to influence production with some delay. At the same time, however, the information in the standard pricing mechanism reduces the efficiency of monetary policy and creates economic shocks. The problem here is that there is insufficient information for both society and public authorities that have to make macroeconomic decisions. Therefore, in economic turbulence with deep deflationary characteristics, monetary policy would not be effective.

Blanchard (2002) came to the empirical conclusion that an increase in costs leads to an increase in output, but at the same time pushes out investment. Another conclusion reached by the authors is that the increase in taxes leads to a decrease in production, exports and imports. From the conclusions made, it can be deduced that the cost multiplier is effective

and leads to increased household consumption and increased production. Therefore, fiscal policy in certain cyclical phases is effective. It is important to note that tax policy must be very precisely synchronized with the budget policy in order to have an optimal effect on GDP dynamics.

The 2008 crisis is built Blanchard's (2012) views on the content of stabilization policy. He points out that the main goals of the macroeconomic stabilization policy are production, inflation, the exchange rate, and they are achieved with macroprudential instruments, which are reduced to regulating the credit policy of the banking system, increasing the liquidity of the banking system, creating capital buffers. The so-called sterilized intervention on the open foreign exchange market can also be used as a monetary instrument.

The purpose of macroprudential management is to preserve the financial system, through which to finance the real economy in times of crisis and economic risk. It is clear that Blanchard sees the interaction between monetary and fiscal policy, but sees fiscal policy as a tool used only in the most severe economic downturns, which are characterized as crises and depressions.

Krugman (1998) analyzes monetary policy and concludes that it is ineffective in certain cases. The case in which it is inefficient is the state of the economy, called the liquidity trap. This condition can also be caused by the monetary policy itself. The economic stagnation and inefficiency of monetary policy can be overcome with expansionary fiscal policy.

Stiglitz (2010) is a supporter of the mix of fiscal and monetary policy, the so-called policy mix, as tools to counter economic downturns. Supporting the thesis of the characteristic understanding of neo-Keynesianism, he defends the thesis that the simultaneous application of fiscal and monetary instruments and their interaction would be the most effective and optimal option that anti-crisis macroeconomic policy should contain. The author, considering the monetary instruments and linking them to the discretionary counter-cyclical policy, came to the conclusion that it should be relied more on the implementation of targeted credit policy, and not only interest rates. This thesis is largely based on the intuitive logic, which is based on the view that the capital, following the profit, at low-interest rates will be directed to risky market niches. Stiglitz (2011), by placing credit policy as the main monetary instrument and the interest rate as an ancillary one, argues that lending should be predominantly targeted at small and medium-sized enterprises rather than large ones, because otherwise, the effect of credit policy will be neutral. The logic here is that the desired credit multiplication will be possible and effective only when lending directs capital flows to the "engine" of the real economy, namely small and medium-sized businesses. This channel of interaction clearly reveals the simultaneous preservation and drive of consumer and production demand, which, corresponding to the dynamics of employment and income, will have a favourable effect on the real economy, which will control the crisis processes and will start a much faster effective economic recovery.

After analyzing the main authors of Keynesian and neo-Keynesian economic theory, we come to the thesis that the two economic paradigms postulate state intervention in a crisis. According to Kirova (2010), the "old" Keynesians and the neo-Keynesians accept that the state should intervene in the economy, but the extent and emphasis of this intervention differ.

Friedman (1948) examines the two instruments of stabilization policy, namely monetary and fiscal policy. He concludes that discretionary monetary and fiscal policies should not be used as tools to regulate the business cycle. According to him, government spending can increase when there is a reciprocal increase in budget revenues. Monetary policy instruments such as open market participation, central bank government financing and targeted lending should not be used as instruments for regulating the trade cycle. He goes even further, arguing that banking instruments should be reduced to deposit banking operations and that the government deficit should be equal to a previously realized budget surplus. He is particularly critical of the progressive way of taxation because, according to Friedman, there is a large lag gap between the assessment of the tax and its actual payment. The logic here is that costs depend on revenues, and when they are already accrued and there is a rough clarity on how much revenue will be collected, the expenditure part of the budget is made, but for the reason, that collection on the basis of progressive taxation has a lag gap, it is possible to deform the stability of the public sector, as the budget balance may be disturbed. From what has been said so far, the author refers to the fact that he actually believes in an automatic stabilization mechanism that rejects discretionary macroeconomic policy. The automatic stabilization is realized on the basis of a balanced budget balance. In fact, Friedman (1948) limits government intervention in economic dynamics by denying discretionary macroeconomic policy. For him, government intervention, which by increasing government spending, is trying to reduce unemployment in a crisis, is the main reason for provoking negative economic processes. This is the main criticism that Friedman (1948) made about the Phillips curve when stagflation arose in the United States in the 1960s and 1970s. According to Friedman (1992), the increase in money supply is due to the rapid growth of government spending, government policy and the Federal Reserve. His main thesis is to regulate the amount of money supply and it must correspond to the dynamics of GDP. Therefore, the interest rate stands out as a monetary instrument that has an active role in the money supply, but at the same time does not require discretionary monetary and government policies to change the structure of the money supply and proves an acceptable instrument of money supply regulation, together with a balanced budget, balance and deficit. The main weaknesses of the theoretical framework developed by him are that he considers the economic dynamics in the long run and that he does not proceed from the reasons that created the financial and economic downturn, i.e., he does not take into account whether the negative shock is induced by supply or demand. Hence, it is now possible to absolutize that government intervention and fiscal policy always lead to inflation, which, in turn, always leads to a simultaneous increase in unemployment.

Schimmelpfennig et al. (2002) examine the effect of fiscal policy on the economy through the fiscal multiplier. They conclude that, although small, the effect on economic development is positive. The strength of the impact of fiscal policy depends on many characteristics, such as the fiscal position before the crisis, the time when fiscal instruments are triggered, the exchange rate, etc. Despite all these conventions, and although the authors do not claim to have fully clarified the impact of fiscal policy, it is concluded that in a recession, the fiscal multiplier may, under certain conditions, be much more effective than the empirical results.

Abdih et al. (2010) argue that in a recession and a fixed exchange rate, fiscal policy is the most effective tool for stabilizing the economy. Restrictive fiscal policy in a recession acts pro-cyclically and deepens the negative shocks and macroeconomic imbalances. The authors

associate the fiscal policy to specific instruments and therefore view government spending and tax rates as direct fiscal instruments that have counter-cyclical characteristics. From what has been said so far, it is also determined when government expenditures and tax rates are pro-cyclical and when they are counter-cyclical. Intuitive economic logic makes it clear that when government spending increases and tax rates fall in a recession or crisis, a counter-cyclical fiscal policy is in place. And when government spending and tax rates remain unchanged in a recession, pro-cyclical fiscal policy is in place.

Debrun (2010) examines fiscal policy and its relationship to economic instability, placing autonomous stabilizers and fiscal policy change as the basis of stabilization policy. In his reasoning, he came to the following conclusions: the first conclusion is that automatic stabilizers have a strong influence on economic dynamics when its trend does not have high volatility and volatility. The second conclusion shows that fiscal policy, which is related to pro-cyclical or counter-cyclical objectives, does not have a significant impact on the dynamics of production. However, on the other hand, the authors argue that fiscal policy, which has no cyclical goals, affects production and consumption. From these conclusions, it is clear that their view is that discretionary fiscal policy pursued by the government in the short term in order to curb cyclical fluctuations would not have a significant impact on the dynamics of production. On the other hand, they argue that in the long run, fiscal policy that takes the form of automatic stabilizers will be effective. They also argue that the government can contribute to macroeconomic stability in the long run. It is clear that the authors assume that the stabilization fiscal policy registers a strong effect on production and consumption when it takes the form of automatic fiscal stabilizers. And automatic fiscal stabilizers are optimally effective provided that there is an interaction between monetary policy and discretionary fiscal policy, which corresponds to the stability of public finances. In other words, according to Debrun (2010), government intervention should consist of building passive fiscal policies that do not register direct interference in economic cyclicity.

Afonso et al. (2019) examine the effect of the expenditure multiplier and the tax multiplier on economic growth. They conclude that the cost multiplier is much more efficient in the recession phase, while the tax multiplier is more efficient in the boom phase. The conclusion made by the authors clearly shows that they come to the thesis developed by Keynes (1991) about the effectiveness of fiscal policy in conditions of economic crisis and support it.

Baum et al. (2011) examine the shocks in fiscal policy. The main conclusion they draw is that discretionary shocks have a large multiplier effect in conditions of economic recessions.

Djuraskovic et al. (2018) investigate the macroeconomic theory in the context of the global economic crisis through the prism of monetary and fiscal policy. The authors conclude that monetary counter-cyclical policy cannot reproduce the effect of fiscal counter-cyclical policy on economic development. They argue that fiscal policy is very effective in an economic recession, as proved by the proposed fiscal measures by China and the United States. Hence, the authors conclude that Keynes's theory makes its great return both in practical and theoretical aspects.

Another point that is important in the analysis of fiscal policy regarding the impact of government expenditure multipliers on GDP is the issue of expenditure efficiency. Guided by the understanding that budget expenditures are a burden on the economy rather than an

incentive, countries are more likely to rely on limited budget expenditures. According to Minassian (2018), the unconditional treatment of this understanding does not correspond to modern trends. What is crucial here is not the amount of budget expenditure, but the way in which the latter is used. The fiscal regulatory strategies should focus on increasing public investment, which stimulates economic growth and cuts inefficient current government spending.

Yotzov (2018) considers the effect of fiscal policy on economic growth in a small open economy, which is in terms of a currency board. The conclusion reached by the author is that the conventional macroeconomic statement is confirmed, that in conditions of crises, the multipliers increase and their influence decreases over time.

Zlatinov (2014) analyzes the possibilities for macroeconomic policy to limit the negative economic shocks. He examines the various economic theories and makes a comparative analysis of their main formulations regarding the coordination of fiscal and monetary policy. It concludes that in the short run in a recession, fiscal policy is effective and monetary policy has a long-term effect, with the main goal being sustainable economic development.

Analyzing the latest research on the economic challenges posed by the COVID-19 pandemic, several reports stand out.

A study by Yotzov et al. (2020) states that the economic crisis caused by COVID-19 has a special character because it began as a crisis of supply, which then turned into a crisis of demand. It is also pointed out that the main channel of the crisis passes through the real economy and especially from the sectors that use the human factor for their production and service activities. The report also provides an in-depth analysis of the measures that countries will take to overcome the COVID-19 crisis. Counter-cyclical measures are divided into two groups of fiscal measures and monetary macro-financial measures.

Di Mauro (2020) claims that COVID-19 will cause a temporary decline in supply and demand. According to him, the global shock in the world economy begins as a supply shock, which will be characterized by the rupture of production chains. According to the author, the shock in consumption will have several sources. The first source will be the affected sectors such as transport and tourism, which depend on the demand of individual households. The second source will be the subjective-psychological factor that will shrink consumption. The decline in income is the third source that will generate a shock in demand. The fourth source is the measures taken by the authorities, which impose social distance. The author arrived at two very important conclusions, which are directly related to the present study, namely, that the shock in demand comes from the measures imposed by the authorities and that the decline in income, i.e., the shrinking demand will be combined with rising costs. Although Di Mauro (2020) does not focus on government measures and demand as the main determinants of the economic crisis in the context of the virus, he clearly highlights the nature and mechanism of the economic crisis of COVID-19. The author argues that the management of the economic crisis that is emerging and will develop must be realized through monetary and fiscal policy. He makes it clear, following the example of the United States, that the first step is to reduce interest rates to encourage investors to invest in the real economy, but the deepening crisis requires fiscal policy, which he says will be much more effective than monetary policy. Boone (2020) point out that the channels through which COVID-19 will provoke an

economic crisis are supply disruptions, declining movement of people, goods and services and high uncertainty, which will affect the contraction of investment and consumer demand. The authors highlight that the management of the economic crisis goes through the management of a possible medical crisis, so in the first place, the costs must be to ensure a good medical work and financial environment. Then, there should be targeted financial transfers in support of households and targeted increase in liquidity buffers in the banking system to serve companies, as well as relief or even exemption from fixed taxes and credit obligations.

Cochrane (2020) postulates an extremely interesting thesis. He argues that the COVID-19 crisis first leads to a supply shock, which in turn creates a shock in demand. The author formulates the conclusion that the conducted monetary policy should be characterized as stimulating, not limiting the money supply and lending.

Wren-Lewis (2020) sees the social effect of the virus as the cause of the economic crisis of COVID-19, as it instills fear in the health of economic agents. This will have a subjective and psychological effect on consumption by reducing demand. In fact, the author points to demand as the root cause of the economic crisis. Of course, he does not ignore the shock of supply, arguing that if many businesses close, it would lead to a greater shock than the shock of demand. It is clear that the author considers different scenarios, but in all cases, the demand remains important in his theses, because he recommends that the government set up a fund to cover the cost of living of those affected by the virus. The author's logic leads to the rejection of conventional instruments of fiscal and monetary policy. However, it can be said that Wren-Lewis (2020) recommends direct government intervention, which is related to financial transfers, which is related to the conduct of fiscal policy and not to monetary policy.

Wyplosz (2020) examines the moral hazard that arises from measures taken by governments to increase their costs. Therefore, it proposes that the European Central Bank (ECB) guarantee the debts of governments, thus differentiating the moral hazard that would arise in a subsequent debt crisis. Also, according to the author, tackling the effects of the crisis requires coordinated action by EU member states.

Gopinath (2020) introduces three main negative shocks, which are realized as a consequence of the economic crisis caused by the coronavirus, namely: supply shock, demand shock and financial shock from increasing the risk of bad loans. The increase in the financial risk of toxic loans will have a negative effect on supply and demand. For this reason, the author proposes to take the following anti-crisis measures: direct remittances to households and subsidies to businesses, as well as tax relief. Special emphasis is placed on the credit policy pursued by the Central Bank, which must have a targeted credit policy towards small and medium-sized enterprises.

Blanchard (2020), looking at the policy pursued by Italy, which is highly fiscally discretionary, calls on the ECB to make final monetary transactions with the Italian government or to buy Italian government bonds, thus stimulating the Italian economy and protecting the euro area from the possibility of a debt crisis. According to him, at low-interest rates, the increase in Italian debt does not pose a moral risk. The developed thesis of Blanchard (2020) actually advocates a continuing expansionary fiscal policy, because the allocation of direct money or the purchase of government securities by the ECB from the

Italian government is in itself a stimulus to fiscal policy through monetary instruments. In other words, monetary policy plays a supporting role in the operation of fiscal policy.

Galí (2020) proposes to implement the strategy of "helicopter money", which means that the Central Bank makes direct transfers to the government at zero interest rates, which in practice means that the government has no debt to the Central Bank and transfers are gratuitous. This proposal by Galí is a consequence of his understanding that the government must pursue a discretionary fiscal policy, but not to create the conditions for a debt crisis and not to burden the taxpayers in a subsequent period.

Krugman (2020) sees conventional monetary policy as ineffective in tackling the economic crisis of the coronavirus because the world is in a liquidity trap and in response proposes that the government implement a continuing budget deficit to finance investments that will push private investments. Thus, the economic crisis will be overcome.

The analytical theoretical review of the main economic schools and the thesis developed by them on the anti-crisis macroeconomic policy in crisis conditions, as well as the review of the literature, including authors who study the anti-crisis macroeconomic policy in a specific economic crisis in COVID-19, lead to the conclusion that discretionary fiscal policy is at the heart of anti-crisis policy, and monetary policy should play a complementary role.

The aim of this study is to check whether in the case of the current anti-crisis macroeconomic policy in Bulgaria the scientific statements presented so far have confirmed or denied, that the more effective model for dealing with the crisis is based on fiscal policy, and monetary measures are ancillary.

3. Methodology and Features of the Research

The survey covers the period 2019-2020 on a quarterly basis. The main focus of the survey is on the four quarters of 2020. Data sources are the Bulgarian National Bank (BNB) and the National Statistical Institute (NSI). The two institutions work with common European methodologies in compiling statistics, which is a condition for homogeneity and allows them to be used simultaneously. The provision of the missing data for the second, third and fourth quarters of 2020 is realized through a "naïve" forecast of a time series or the so-called "extrapolation". After calculating the forecast values of the missing features of the dynamic sample, the impact and effects of fiscal policy and monetary measures on the business cycle, which is expressed in terms of GDP dynamics, are calculated.

The forecast can be expressed mathematically with the following expression (Brooks, 2014):

$$E(y_{t+1} | \Omega_t) = y_t, \text{ where} \quad (1)$$

E – product

Y_{t+1} – expected forecast value

$t+1$ – future period

t – period

| – the whole available information

Ω_t – the whole time range

Equation (1) represents the extrapolation. It expresses the expected future value of the relevant time series, which is derived from the presented information from past values of the attribute in the statistical population, which covers all the dynamics for the entire time period for which information is available.

In the present study, the predicted values of the time series are sought, which allows the use of a linear regression model, through which the future values of the time series can be found.

The linear model takes the form of the conventional regression equation:

$$y = \alpha + \beta x, \text{ where} \quad (2)$$

Y – dependent variable

α – available parameter

β – parameter of the equation

x – independent variable

To predict y , information must be extracted from the parameters of the equation. Equation (3) illustrates that the parameter α derives its value from the average values of the variables.

$$\alpha = \bar{Y} - \beta \bar{X} \quad (3)$$

Equation (4) also shows that the parameter β subtracts its values from the mean values of the variables. Therefore, the values of the variables Y and X in period t are known, as well as their mean values. From here it is now possible to conditionally predict the average value of the future value of y .

$$\beta = \frac{\sum(X - \bar{X})(Y - \bar{Y})}{\sum(X - \bar{X})^2} \quad (4)$$

The effectiveness of fiscal policy is revealed through the multiplier. The multiplier derived by Keynes (1991) has the following mathematical form:

$$1 - \frac{1}{k} \quad (5)$$

The equation expresses the marginal propensity to consume, which is the basis of the investment multiplier, where k is the investment multiplier. Therefore, methodologically the main determinant that determines the efficiency of fiscal policy is the marginal propensity to consume, which in its original form is written with the following mathematical expression:

$$\frac{dC_w}{dY_w}, \text{ where} \quad (6)$$

C_w – consumption, expressed in units of wages

Y_w – income as units of wages

Δ – the change in consumption and income

The mathematical expressions (5) and (6) express the essence of the multiplier in the conditions of a closed economy. The increase in government expenditures, represented by investment and consumption, leads to an increase in total income.

The basic model of the multiplier can be described by the following mathematical equation:

$$\Delta Y = 1 - \frac{1}{k} \times \Delta VI, \text{ where} \quad (7)$$

ΔY – change in total income

ΔVI – change in investments

$1 - \frac{1}{k}$ – the value of the multiplier

The basic logic and the derived equations from Keynes (1991) lead to the creation of different types of fiscal multipliers in theory and their use in practice. The expenditure multiplier, which shows what change in GDP the marginal change in government spending (8) and (9) will lead to. GDP can be written with the following equations (Spasov, 2008):

$$M = \frac{1}{1 - MPC} = \frac{1}{MPS} = M_G, \text{ therefore:} \quad (8)$$

$$M_G \times \Delta VG = \Delta Y \quad (9)$$

M_G – government expenditure multiplier

MPC – marginal propensity to consume

MPS – marginal propensity to save

ΔY – change in GDP

ΔVG – change in government expenditure

To correspond to the real circumstances, the methodology of the study illustrates the multiplier in a proportional way of income taxation, as in Bulgaria the taxation of income of individuals and corporate income taxation of legal entities is proportional (equation 10).

$$M_t = \frac{1}{1 - MPC(1-t)}, \text{ where} \quad (10)$$

M_t – multiplier in a proportional way of taxation

t – proportional tax rate

Equation (11) visualizes the calculation of the aggregate marginal tax rate that has the greatest impact on income and consumption propensity.

$$T = IT + PIT + VAT, \text{ where} \quad (11)$$

T³ – total marginal tax rate

IT – rate of corporate tax

PIT – rate of personal income tax

VAT – value added tax

Bulgaria's economy is small and open and this requires considering the marginal propensity to import, as imports are the variable that reflects the openness of the economy and affects the multiplier effect.

$$MPM = \frac{VIM}{VY}, \text{ where} \quad (12)$$

MPM – marginal propensity to import

VIM – change in import

VY – change in total income

From the derived equations so far we could derive the aggregate fiscal multiplier. Equation (13) is, in fact, the basic equation used in the empirical study and evaluation of the effectiveness of fiscal policy under COVID-19. Mathematically, this can be expressed by the following equation (Zlatinov, 2016):

$$VY^f = \frac{1}{1 - MPC \times (1 - ta_{t-1}) + MPM} \times VG_{t-1} \quad (13)$$

One expresses the mathematical function by equation (14), which shows that the increase in total income is a function of the increase in money in circulation. The contribution of monetary measures to GDP dynamics is also expressed.

³ Social and health insurance are not included.

$$\Delta Y = f(\Delta VM * V) \quad , \text{ where} \quad (14)$$

ΔM – money in circulation

V – velocity of money circulation

Y – quantity of products

Developing the equation, we obtain the following expression:

$$\Delta Y = \frac{\Delta VM}{\Delta vbl} * V \quad , \text{ where} \quad (15)$$

ΔVM – money aggregate M1

Δvbl – change of interest-free bank loans up to BGN 1,500 and credit for small and medium-sized enterprises, which is divided into the following variables:

$$\Delta vbl = \Delta vBLSMB + \Delta vIFBL \quad , \text{ where} \quad (16)$$

$\Delta vBLSMB$ – the change in loans to small and medium-sized enterprises

$\Delta vIFBL$ – change of interest-free bank loans up to BGN 1,500.

In fact, equation (15) expresses the marginal increase in money in circulation as a result of the monetary measures taken, which allows a more accurate assessment of the monetary measures introduced.

4. Results and discussion

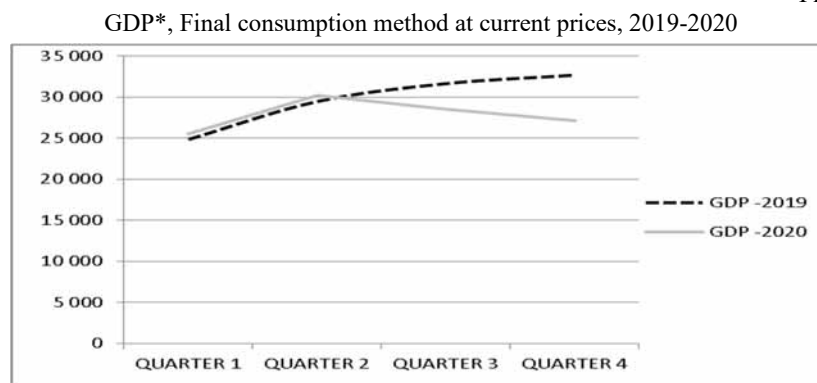
This section presents the results of the performed mathematical operations and accordingly analyzes the effects of the fiscal policy and monetary measures on the created recession shock from COVID-19 in Bulgaria by GDP.

As it can be seen from Figure 1, the economic dynamics in 2020 registered anticipating rates in the first quarter, compared to 2019. These outpacing dynamics continue as an inertial force and sometime in late April 2020 the trend reversed sharply. The reason for this sharp asymmetric reversal of the trend of dynamics of the Bulgarian economy is the political decision to declare a state of emergency in Bulgaria on 13.03.2020, which lasted until 13.05.2020, which is actually caused by COVID-19. In this situation, the fiscal policy is fundamental in order to be able to control and mitigate the economic downturn, which began to manifest itself in full force in the third and fourth quarters of 2020.

The dynamics of aggregate consumption clearly expresses that if adequate fiscal policy and monetary measures are not implemented, by the end of 2020, aggregate demand will decrease compared to the same period of 2019. This trend would be extremely negative for the

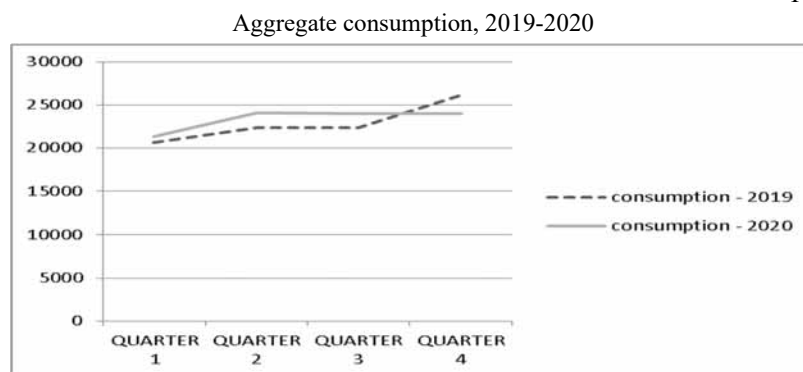
Bulgarian socio-economic system, as the economy is expected to enter the real phase of recession by the end of 2020.

Figure 1



* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.
Source: NSI, Author's calculations

Figure 2



* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.
Source: NSI, Author's calculations

4.1. The effects of the fiscal policy on the dynamics of the Bulgarian economy in terms of COVID-19

The effects of the fiscal policy on the recession gap created by COVID-19 will be seen as directly corresponding to the effect of the 'tax holiday' as well as to the effect of the tax holiday, as the period covering the "tax holiday"⁴ is in fact during the second quarter 2020.

⁴ "Until June 30, the term for payment of the final social security contributions for compulsory social and health insurance of self-insured persons who work as sole traders and farmers who have chosen to

The tax preference will, in fact, introduce for a period of time a specific structural change in the equation used, which will show the effectiveness of fiscal policy and its contribution to GDP at zero tax burden. And the other fiscal measure, which comes down to financial assistance to businesses with measure 60/40⁵ does not require a specific modification of the equation that calculates the contribution of fiscal policy to GDP.

As the data in Table 1 show, the marginal propensity to consume for all quarters of 2020 is higher than the marginal propensity to consume in 2019. This is an argument that leads to the forecast that the implementation of a fiscal counter-cyclical policy would be significantly effective. At the end of 2020, the marginal propensity to consume having a tendency to increase, reaching values of 0.88, which significantly exceed the values of the marginal propensity to consume in the last quarter of 2019. Also, the forecast data for 2020 express a growing marginal propensity to consumption in the fourth quarter of 2020, compared to the first quarter of 2020. The rising marginal propensity to consume, combined with the declining marginal propensity to import, is an indication that consumption is more focused on domestically produced goods and services than on imported goods and services, which means that the fiscal multiplier will reproduce more efficiently. Of course, it should be clarified here that the consumption in Bulgaria is very dependent on imports and therefore maintaining the average marginal propensity to import to the level of 2019 should be considered as a positive effect, because other things being equal, it will increase the contribution of fiscal policy to dealing with negative economic processes.

Table 1
Coefficients of the degree of efficiency of the incurred government expenditures

Coefficient Period	Marginal propensity to consume		Marginal propensity to import	
	2019	2020	2019	2020
Q1	0.83	0.84	0.68	0.65
Q2	0.76	0.80	0.61	0.58
Q3	0.71	0.84	0.58	0.59
Q4	0.80	0.88	0.56	0.61

* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.

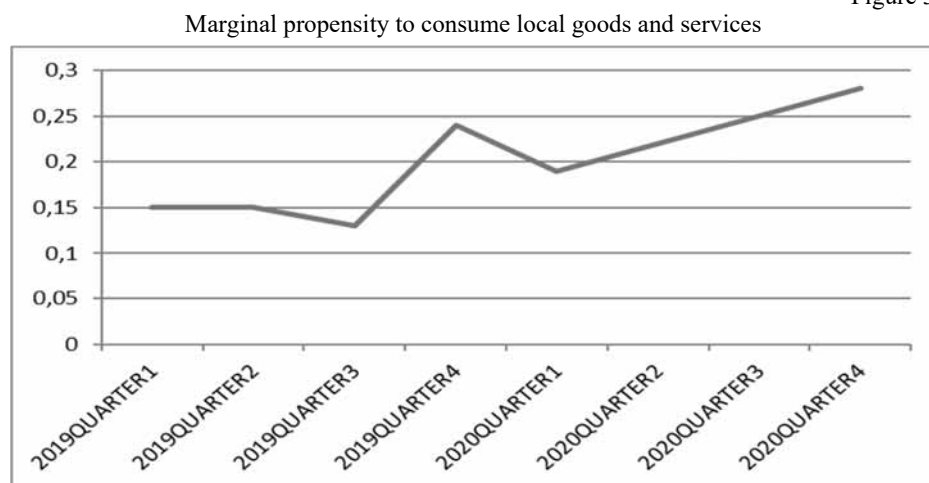
Source: NSI, Author's calculations

be taxed under Art. 26 of the Personal Income Tax Act / PITA /, as well as for sole proprietors who are subject to patent tax under the Local Taxes and Fees Act. Until June 30, the deadline for declaring and paying corporate tax is extended / Art. 92 and 93 of the Corporate Income Tax Act /, the tax on expenses, the tax on the revenues of budgetary enterprises, the tax on the revenues from ancillary and ancillary activities within the meaning of the Gambling Act, as well as the tax on the operation of ships.” (<https://nra.bg/>).

⁵ „The 60/40 measure is a short-term tool for urgent business support to maintain employment, but also to guarantee the income of employees. The amount of compensation will be 60% of the insurance income for the month of January 2020 and of the due contributions of the employer for the same month for each employee for whom the regime of suspension of work has been applied or part-time work has been established. In the event of termination of employment, employers who have received compensation should pay the full amount of remuneration to the persons and the due social security contributions for the respective month. In case of part-time work, the employer pays the full amount of the remuneration, defined as for full-time work, and the due insurance contributions for the respective month.“ (<https://coronavirus.bg/bg/114>).

An important trend in the structure of marginal propensity to consume (Figure 3) is that the marginal propensity to consume local goods and services increases, which mechanically leads to greater efficiency of budgetary incentives. It is extremely important that the projected increase in the marginal propensity to consume goods and services of national production begins to increase and maintains this trend in 2020, certainly, of a forecast nature. It is in the year when the Bulgarian economy will feel the economic recession in full force.

Figure 3



* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.
Source: NSI, Author's calculations

Fiscal policy in the context of economic recession in 2020 registered a much larger contribution to economic growth than in 2019 (Table 2). Only the second quarter, when there is a "tax holiday", registered a lower contribution rate to GDP compared to the second quarter of 2019. This result fully corresponds to the theory that the crisis multiplier is more effective. The impact of the multiplier is almost timely in 2020, but its full effect is realized in the third quarter and then there is a decrease in its strength, which fully corresponds to the short-term stabilization and anti-crisis effect that fiscal policy reproduces. It is also logical to multiply the multiplier effect in the third quarter of 2020, given that the crisis will start to develop in mid-March 2020. However, the short-term effect of the conducted fiscal policy is characterized by a certain stability, because although the multiplier reduces its impact, the multiplication and the cumulative process of positive impulses do not subside immediately, but continue to affect economic activity.

Table 2

Contribution of fiscal policy to GDP

Coefficient Period	Contribution of fiscal policy to GDP without tax preferences		Contribution of fiscal policy to GDP with tax preferences	
	2019	2020	2019	2020
Q1	0.54	0.68		
Q2	1.63			0.80
Q3	0.28	3.22		
Q4	0.34	0.86		

* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.

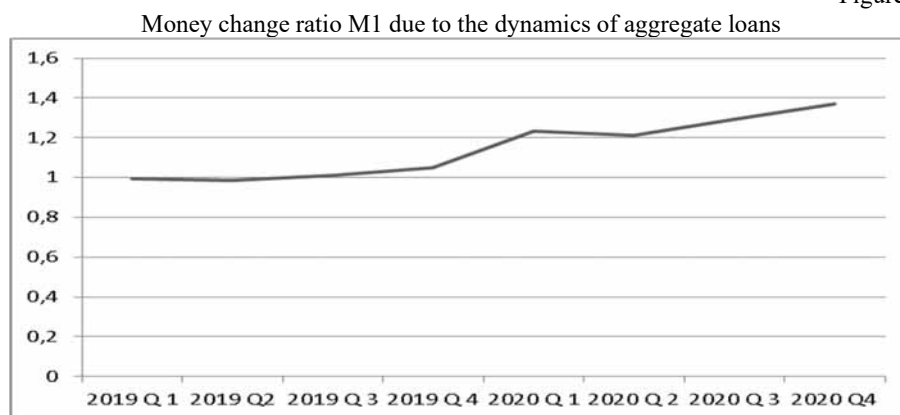
Source: NSI, Author's calculations

The derived empirical results emphasize that the cost multiplier has a much stronger impact than the tax multiplier. The obtained results substantiate the thesis that the effect of the tax measures is manifested with a greater lag delay, as well as that the postponement of the tax payments cannot give an immediate positive effect on the economic dynamics. It is important to note that, in fact, the personal income tax, which starts to be declared and paid from the beginning of the year until April 30, is not reduced, nor is this period extended. It is this detail that turns out to be the characteristic that reduces and slows down the influence of the tax multiplier in the aggregate multiplication, which is the goal of the anti-crisis fiscal policy. It should be noted here, however, that the synthesis of the cost multiplier with the tax multiplier from a theoretical and practical point of view is an extremely correct anti-crisis strategy, which, however, depends on some of their characteristics. The expenditure multiplier quantitatively proves its effectiveness, but depends to a large extent on the size and specific objectives and transfer mechanism of the conducted fiscal policy. This logic also applies to the tax multiplier, which also depends on some of its structural characteristics, such as whether it will be based on preferences affecting direct or indirect taxes or both types of taxes and which taxes and tax rates will be used as regulators, which will form and direct the action of the tax multiplier. In summary, it can be said that fiscal policy will implement in the short term positive regulation of the trade cycle and will provoke the reversal of the phase of the cycle from crisis to recovery.

4.2. The effects of monetary measures on the dynamics of the Bulgarian economy in terms of COVID-19

Since the fiscal policy has been considered so far, this part of the study will consider the effects of monetary measures on the Bulgarian economy. In 2020, the ratio of money in circulation, expressed through the money aggregate M1, registered an indicative increase compared to the four quarters of 2019, due to the change in aggregate lending. This finding proves that this monetary instrument is significantly efficient in terms of the money supply.

Figure 4



* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.
Source: BNB, Author's calculations

The credit monetary measure is characterized by very low contribution coefficients to GDP dynamics (Table 3). The coefficients are especially low in 2020 and their impact is insignificant and in certain lag values deterrent. Therefore, the direct impact of loans on GDP cannot be considered as highly stimulating. This is because the credit policy undertaken delays the repayment of loans, but does not eliminate the obligation, and in case of uncertainty with an unclear deadline, economic agents, whether households or companies, do not show much inclination to assume future debt (which they do not know when and whether will be able to pay off). This is precisely the reason why the direct impact of lending on GDP is insignificant and even restraining. According to the data from the Bulgarian Development Bank as of July 20, 2020, only 100 companies have taken advantage of these credit opportunities and 12,290 individuals, which is a small percentage of the unemployed and companies in need of financial assistance. It is clear that loans indirectly affect GDP through production and consumption, increasing the money supply, but not by being used by unemployed individuals and small and medium-sized enterprises, but by larger and more powerful companies that use loans as leverage to maintain their activities and workers during the crisis. It is clear that loans have an anti-crisis effect on the economic cycle through the transmission variable M1 and through their interaction with other factors that increase money in circulation.

The contribution rate of monetary measures to GDP (Table 4) in 2020 remains high in different quarters, with a value of about one. Monetary measures induce a positive momentum in economic dynamics, and this momentum will cause counter-cyclical processes. It is noteworthy that the contribution rate of monetary measures to GDP is high in 2019, as in the fourth quarter of 2020 is lower than in the fourth quarter of 2019. This shows that the moment when the Bulgarian economy has entered the peak of the economic crisis, the monetary measures will begin to be characterized by declining efficiency. In other words, lending will lose its effectiveness in interacting with other components of the money supply.

In summary, money in circulation as an expression of aggregate monetary measures contributes to regulating the economic cycle by reproducing counter-cyclical effects. Monetary measures, therefore, play an important role in counter-cyclical macroeconomic policy.

Table 3

Credit policy contribution to GDP*

Period	2019**	2020
<i>Q1</i>		-0,00052
<i>Q2</i>	0,01181	0,021739
<i>Q3</i>	0,000807	-0,00031
<i>Q4</i>	0,000316	-0,00033

* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.

** Data for 2019 are available from the second quarter.

Source: BNB, Author's calculations

Table 4

Monetary measures contribution to GDP *

Period	2019**	2020
<i>Q1</i>		1,00
<i>Q2</i>	0,85	0,97
<i>Q3</i>	1,00	1,14
<i>Q4</i>	1,02	0,99

Source: BNB, Author's calculations

* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.

** Data for 2019 are available from the second quarter.

4.3. Results of the study and the anti-crisis macroeconomic policy to overcome the socio-economic consequences of COVID-19

From the considerations made so far, it is clear that both fiscal policy and monetary measures and their coordination and structuring have a constructive and decisive influence on the conducted anti-crisis macroeconomic policy. Bulgaria is a country which operates in currency board, which means that a full counter-cyclical monetary policy cannot be applied. Therefore, the basis of the counter-cyclical macroeconomic policy must be built on the basis of expansionary fiscal policy, and monetary measures must be complementary. Thus argued, the main thesis requires both theoretical and quantitative evidence. Quantitative evidence allows a comparative analysis to be made between the contribution of fiscal policy and monetary measures to GDP dynamics and its cyclical development.

As it can be seen from Table 5, on a quarterly basis, monetary measures register higher values than fiscal policy. In the third quarter alone, the contribution of fiscal policy to GDP was significantly higher than the contribution of monetary measures to GDP in the same quarter. However, considered on an annual basis as a cumulative contribution and an arithmetic mean contribution, fiscal policy registered higher values. The coefficient of the total contribution of fiscal policy to GDP for 2020 is 5.56, while the coefficient of the total contribution of the

monetary measures to GDP in 2020 is 3.99. The coefficient of the arithmetic means contribution of the fiscal policy to GDP in 2020 has a projected value of 1.39, and the coefficient of arithmetic mean contribution of the monetary measures to GDP in 2020 is 1. Therefore, the fiscal policy has a larger contribution in GDP than the monetary measures. It follows that the interaction of fiscal and monetary measures is decisive for the anti-crisis macroeconomic policy, but the main instrument is the fiscal policy, and the complementary instrument is the monetary measures.

However, the quarterly values of the ratios of monetary measures to fiscal policy, however, raise the question of why, considered on a quarterly basis, monetary measures have predominantly higher values than the ratios of the contribution of the fiscal policy to GDP. The answer lies in the following logic. First, more of the financial anti-crisis macroeconomic package goes to monetary measures. Second, monetary measures are chosen as the basis for anti-crisis macroeconomic policy, through the increase in credit liabilities to fiscal measures. Third, the aggregate fiscal multiplier needs time to be activated because it relies on activity from companies applying for the 60/40 measure and the unemployed to register as unemployed, and the principle of operation of the fiscal multiplier in order to be effective is associated with active consumption and targeted investment. Also, the application of fiscal measures does not correspond to the mechanism of the aggregate fiscal multiplier.

Table 5
Comparison of the contribution of fiscal policy and monetary measures to GDP* in Bulgaria – projected trends

Period Coefficient	2020Q1	2020Q2	2020Q3	2020Q4	Aggregate contribution for 2020	Arithmetic mean contribution for 2020
<i>Contribution of fiscal policy to GDP</i>	0,68	0,80	3,22	0,86	5,56	1,39
<i>Contribution of monetary measures to GDP</i>	0,97	1,14	0,99	0,88	3,99	1,00

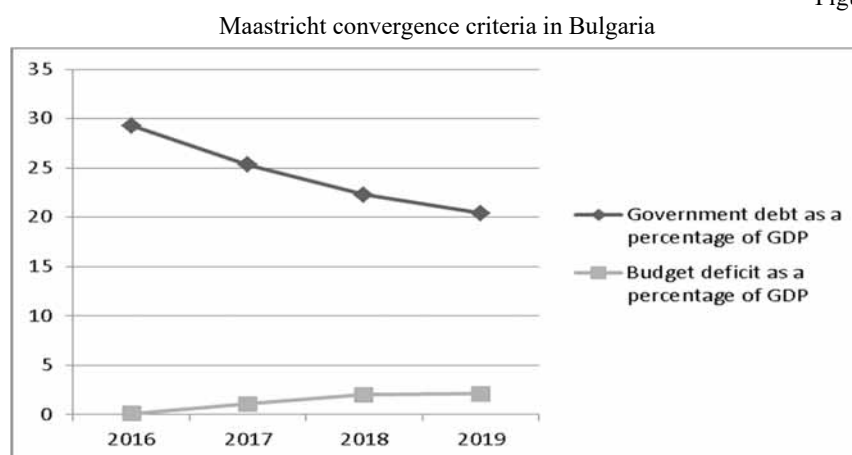
* GDP for the second, third and fourth quarters of 2020 are projected by extrapolation.
Source: NSI, BNB, Author's calculations

From the results, presented in this study, it is clear that in the basis of the anti-crisis macroeconomic policy in Bulgaria is used monetary measures and not fiscal policy. But the anti-crisis macroeconomic policy constructed on the basis of monetary measures and complementary fiscal policy could not realize potential effectiveness in overcoming the negative cyclical trends that have arisen and are developing in the dynamics of the Bulgarian economy. For this reason, counter-cyclical macroeconomic policy should be restructured as fiscal policy as the main one, and monetary measures should be complementary. The specific fiscal policy should be characterized by a much higher amount of realized government expenditures, as well as to cover 100% of the financial needs of the economic agents. The monetary measures that need to be reformed are related to the fact that loans up to BGN 1,500 start to be repaid at the moment when the borrower has started working and his salary allows

him to repay this loan from half of his savings. Thus constructed and regulated, the anti-crisis policy would lead to the necessary economic efficiency to overcome the economic crisis and the social consequences of COVID-19.

The values of the two public indicators – government debt and budget deficit (Figure 5), which are included in the Maastricht convergence criteria in the previous period 2016-2019, are characterized by much lower values than allowed. It is this trend in the development of public finances that allows and argues once again that fiscal policy and the action of the aggregate fiscal multiplier are the basis of a successful anti-crisis policy in the conditions of COVID-19. The arguments also apply with the same force and support the thesis that the size of the government expenditures, which are the basis for the effective and efficient operation of the fiscal multiplier, must be increased.

Figure 5



Source: NSI, Author's calculations

Conclusion

The COVID-19 pandemic has placed the Bulgarian economy in a complex socio-economic situation, which requires the implementation of anti-crisis macroeconomic policy. The structuring of this anti-crisis macroeconomic policy must be based on the cause of the economic downturn and the effectiveness of fiscal policy and monetary measures. The cause of the negative economic shock is the policy taken, and the circumstance that provokes the political action is the pandemic of COVID-19. Therefore, the cause of the economic downturn must correspond to the structure of the anti-crisis macroeconomic policy. It follows that the basis of the macroeconomic policy must be fiscal policy, monetary networks must be a complementary anti-crisis tool. This logic is also argued by the fact that Bulgaria is on a currency board, as well as by the mathematical calculations that lead to the results that the aggregate and arithmetic mean the impact of fiscal policy is stronger than the impact of monetary measures on GDP. And the credit instrument itself has a negligible and rather

restraining effect on the positive dynamics of GDP. The main conclusion that can be drawn is that fiscal policy is more effective than monetary measures in overcoming the economic and social consequences of COVID-19. These conclusions fully confirm the scientific statements exposed in the literature review.

The conducted research on the effect of fiscal policy and monetary measures in the conditions of COVID-19 requires future development and use of an econometric apparatus, which is currently inapplicable, as statistics are very scarce. There are also questions related to the application of specific fiscal and monetary instruments, such as where exactly to invest government expenditures, the rate of which the tax is better to differentiate, whether the required minimum reserves (MRLs) should be used as a tool, etc. All these questions, as well as many others that arise, have not found a place in the present work, but this gives rise to much future research.

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