

WORKING PAPER SERIES

Kalina Dimitrova

**MONETARY AND FISCAL POLICIES IN BULGARIA:
LESSONS FROM THE HISTORICAL RECORD**

Working Paper No. 13/2010

Monetary and Fiscal Policies in Bulgaria: Lessons from the Historical Record

Kalina Dimitrova
*Department of Economics and Business Administration,
“St. Kliment Ohridsky” Sofia University
South-Eastern European Monetary History Network, Bulgarian National Bank
ICER-Torino*

June 2010

Abstract: There are two aspects through which an economic policy can influence the economic situation– monetary and fiscal. Monetary and fiscal policies have different and sometimes controversial goals to achieve by means of specific instruments. While the mission of central banks is generally price stability, governments usually set their goals in the realm of economic growth and employment. Fiscal institutions, however, often use inflation in order to derive revenues (seigniorage) and finance budget deficits. Hence, inflation is viewed as a public finance phenomenon (Barro, 1979; Mankiw, 1987; Grilli, 1989).

The purpose of this paper is to present a historical perspective on the behaviour of the monetary and fiscal policies pursued in Bulgaria from 1879, when the Bulgarian National Bank was established (soon after the liberation from the Ottoman Empire). Furthermore, historical time series of monetary and fiscal indicators give us the chance to study the link between government budget problems, fluctuations of monetary variables and inflation dynamics in different monetary episodes.

Keywords: monetary and fiscal policy, inflation, exchange rate.

JEL: E31, E63.

1. Introduction

There are two aspects through which an economic policy can influence the economic situation– monetary and fiscal. Monetary and fiscal policies have different and sometimes controversial goals to achieve by means of specific instruments. While the mission of central banks is price stability, governments set their goals in the realm of economic growth and employment. Fiscal institutions, however, often use inflation in order to derive revenues (seigniorage) and finance budget deficits. Hence, inflation is viewed as a public finance phenomenon (R. Barro 1987, G. Mankiw 1987, V. Grilli 1989).

In central bankers' language, the “long-term target” of this paper is inflation and how it is influenced by fiscal policies. The study does not dare to oppose the fact that inflation is a monetary phenomenon. It would rather apply this statement as a necessary condition. The interaction between fiscal and monetary institutions, however, reflects itself on price development. Hence, taking into account the role of monetary policies in setting prices, the present paper will try to estimate the influence of fiscal policies on money creation, and hence on inflation.

The monetization of budget deficits resulting in inflation is known in literature as “fiscal dominance” (King-Plosser 1985). It is, however, sometimes considered a historical coincidence rather than a theoretical rule (Walsh 2003: 151). Then, how should it be considered when history repeats itself? Bulgaria is an example of this, keeping recent memories of the devastating consequences of fiscal dominance on the monetary policy in the first period of its transition which resulted in hyperinflation and the introduction of the currency board in mid-1997. Therefore, it is important to know our history well and to interpret it with a modern economic language, applying a quantitative analysis approach.

The time span of the present study covers the monetary history of Bulgaria from the establishment of the Bulgarian National Bank in 1879 to 1947, when the nationalization of the economy took place. The time boundaries of this study are logically determined by the set-up of the Bulgarian National Bank, which closely followed the

establishment of the political independence of Bulgaria from the Ottoman Empire in 1878, while since 1947 when the centrally-planned economy was established budget balances were reported for a 5-year period and prices were administratively set not reflecting the demand and supply factors. Moreover, the banking system was a mono-bank one and the BNB functioned as a central and trade bank, financing various government structures without limits (Avramov 1999).

The present paper starts with a brief review of the literature which argues that inflation could also be classified as a “fiscal phenomenon”. The third part introduces the historical background of this study, the legislation defining the relations between the central bank and the government institutions, and the research studies of that time providing evidence for the presence of a strong influence of fiscal policy on money creation. In section four, an empirical analysis is conducted and econometric estimations are derived in order to draw some conclusions and policy implications on the interaction between monetary and fiscal policies under different monetary regimes.

2. Review of the literature

As mentioned in the introduction, the starting point of this paper is the theory which views inflation as a monetary phenomenon (Quantitative theory of money). Given that the output and velocity of money are constant in the long run, one can recall that in the context of the quantitative equation of money the price level is determined by the money supply in the economy¹. It is interesting, however, to establish what determines the money supply and if the fiscal policy has any influence on this.

Several theoretical streams have attempted to answer these questions analyzing the intertemporal budget constraint. In brief, the logic of this constraint is that the sum of all government budget balances should be equal to zero at their present value. For example, a government with an issued public debt should attain budget surpluses in the future. The surplus could be generated by future extra revenues from seigniorage or increase in taxes. Two representatives of the optimal seigniorage theory argue that the

¹ $M*V=P*Y$, where M is money supply, V is velocity of money, P is the general price level and Y is national output (income).

seigniorage coming from money creation is conditional upon the balance between budget expenditures and budget revenues (G. Mankiw 1987, V. Grilli 1989).

Robert Barro studied the impact of government expenditures on money growth and found that temporary changes in government purchases raised money growth and inflation when the Gold Standard was suspended (R. Barro 1987). A positive correlation between money growth and budget deficits, however, can take place in the absence of fiscal impact on money creation (R. Barro 1979, E. Joines 1985: 331). If governments were to target real as opposed to nominal values of government debt, nominal debt would rise in proportion to the price level; so long as money growth and inflation are positively correlated, deficit and money growth should also be positively correlated in the absence of debt monetization by the central bank.

King and Plosser coined the term “fiscal dominance” in their seminal paper of 1985, implying the potential influence of fiscal policies over monetary policies. In other words, fiscal dominance is a situation in which the fiscal policy is set a priori, while the monetary policy generates enough seigniorage to satisfy the intertemporal budget constraint. Leeper (1991) generalized the case to one of active fiscal and passive monetary policies. Long-term historical studies provide different categories of evidence as to the presence of fiscal dominance over money creation in Italy (Fратиanni-Spinelli 2001), and in Spain (M. Sabate et al. 2004) from the time when the Bank of Spain was granted note issue monopoly to the Second World War (WWII).

At the very opposite pole of the quantitative theory of money is the so called “Fiscal theory of prices”. It comprises a number of studies attempting to constitute inflation as a pure fiscal phenomenon excluding the intermediation of monetary policies (Chr. Sims 1994, M. Woodford 1995, 2001). This theory focuses on a variety of prices satisfying the money market equilibrium, and on the fiscal authority as the one which sets the “equilibrium price”. In contrast to other theoretical streams, the fiscal theory of prices interprets the intertemporal budget constraint as a framework rather than as a constraint which has to be fulfilled at any given price level. Yet, it has to be met only at the equilibrium price and the nominal government debt plays a crucial role in setting the price level.

This approach has its critics, which seriously object to the argument that the intertemporal budget constraint is met only at equilibrium (B. McCallum 2001, W. Buiter 2002). The increasing number of papers dedicated to the fiscal theory of prices, however, raises interesting questions not only in the field of monetary theory, but also concerning monetary policies.

3. Bulgarian historical background and legislation

Bulgaria attained independence from the Ottoman Empire in 1878 and in less than a year the Bulgarian National Bank (BNB) was established as a state trade bank responsible for the financial intermediation of the foreign trade and for the stability of the national currency – the Lev. According to its statute, the BNB was subordinated to the Ministry of Finance and most decisions concerning monetary policies were subject to agreement or permission by the Minister himself (R. Avramov 1999). Before the BNB was granted the privilege to issue banknotes in 1885 (only gold-backed banknotes), different foreign currencies were allowed to circulate and the Ministry of Finance was responsible for the coinage of the Bulgarian Lev.

Although Bulgaria legally introduced a bimetallic system of the Latin Monetary Union type (1880), a silver standard was de facto in practice due to the enforced high value of silver money and particularly of the Russian Silver Ruble (N. Kiosseva, 2000). As a result of the money market which was flooded with silver coins, a difference between the legal and the market price of silver coins appeared – an agio, varying between 4% and 9 %. The BNB efforts to manage money in circulation were vain; it accumulated losses since it was obliged to respect the legal parity of silver to gold at the ratio 15.5:1 and did not have any instrument to limit the silver coins minted by the financial authority upon budget needs (Dimitrova-Fantacci 2010a). Several years after its neighbouring countries, Bulgaria demonetized the Russian Silver Ruble in 1887 and prohibited the circulation of foreign coins which almost led to the disappearance of the agio.

In 1891 the BNB got the legal right to issue silver-backed banknotes in order to have a better control of the money in circulation, but instead of activating this privilege, the Ministry of Finance preferred to put a new volume of Bulgarian silver coins into

circulation. Only in 1899 the BNB was de facto allowed to start issuing silver-backed banknotes against providing more credit to the government.

As stated in the Law dating back to 1885: “The BNB credit to the government could not exceed more than 1/5 of its capital”, which equaled 1 824 thousand levs expressed in absolute term. Until 1889 the government obtained money from the BNB sporadically and against government securities (BNB 1929: 132). At the outbreak of the economic crisis at the end of the XIX century, Bulgarian fiscal authorities began to receive regular direct credits from the central bank for its short-term needs. The treasury, however, at the same time kept some deposits at the bank for some fiscal transactions.

Since 1902 the BNB loans to the government increased and became a permanent item on the asset side of its balance sheets, apart from the credits received from abroad. This was a period of huge construction of public goods, such as railway and motorway building, financed both by local and foreign resources (BNB 1929: 138). In spite of the fact that the Law in 1906 did not put any qualitative constraint on central bank financing of the budget, it stated that the central bank could extend credit to the government only for short-term (up to 3 months) needs. A new amendment of the Law in 1911 clarified that the BNB was allowed to provide financial support to the budget for “less than its nominal capital”, i.e. 20 000 levs.

From 1912 until 1922 the BNB did not have any limit on the credits provided to the government for war financing as Bulgaria entered a long period of wars - the Balkan wars and First World War (WWI). As a consequence, the public finances were completely destroyed. Moreover, being defeated in WW-I, Bulgaria faced the heavy burden of war debts and had to provide huge sums for debt services. This resulted in the inability of the MF to put public finance in order for almost a decade.

In 1924 radical efforts for monetary stabilization - among which harder budget constraints on the public finance - were enforced. The BNB direct credit to the government was stabilized at a certain limit since according to the new Law “the overall credit to the government should not exceed 4.700 million levs”. The extra fiscal needs, however, were met by credits from abroad and negotiated with the League of Nations. In 1926 Bulgaria obtained the so called Refugees’ Loan, which was provided to cover the expenses for Bulgarian refugees from neighbouring countries at the change of the

boundaries after WW-I. Two years later the government was granted the Stabilization Loan for the implementation of the monetary stabilization, in compliance with the international agreements. Although the stabilization in Bulgaria started de facto in 1924, it was legalized in 1928 when the Gold exchange standard was introduced (R. Avramov 1999, 152).

According to the new statute, the BNB should have acted as an independent central bank. It was only a short time, however, before the first signs of the Great Depression appeared. The world liquidity crisis worsened the budget balance and the government was in need of more extra financing (seigniorage). There was a legislative provision at the end of 1928 stating that the government should repay its debt to the central bank, but it was never put into practice and was dropped out of the Law shortly after with the permission of the Financial Committee of the League of Nations. Furthermore, the amendment stated that “the BNB net profit and seigniorage should not be used to pay back the government debt to the central bank, but for current expenses of the Treasury”.

At the outbreak of WWII the government did not provide any sums in the budgets to repay its debt to the BNB. The new Law dating back to 1937 seemed to put some obligations on the budget to repay its debt to the central bank by requiring that the Treasury should buy back government securities from the BNB at the value of 1 billion levs. At the same time the government was allowed to get direct credit from the monetary authorities. Therefore, this was simply a balance sheet transaction between two components of the government debt to the central bank resulting in no decrease of its total stock. Moreover, there was no limit for the BNB to credit the budget.

One of the latest amendments of the BNB Law for the period under study said that “the BNB will extend an additional amount of money not exceeding 140% of the capital and reserves against government securities provided by foreign companies for government purchases, which have to be cleared in less than 7 years” (1940). These purchases were mostly from German companies in the period of the clearing agreements and compensation deals in the 1930s².

² For more details on the exchange rate control in Bulgaria in the interwar period see Nenovsky and Dimitrova (2007).

4. Evidence of fiscal influence on money creation

Our analysis of the long-term record of the fiscal influence on money creation in Bulgaria and hence on inflation will incorporate an interdisciplinary approach. First, we will provide a descriptive evidence from the literature of the interaction between fiscal and monetary authorities. Then, we will proceed with empirical evidence showing the development of the indicators of interest in different periods of time characterized by specific monetary arrangements. Finally, the last piece of evidence will be generated by the application of econometric tools to the respective variables.

4.1 Evidence in the literature

Central bank dependence on fiscal policy has been the focus of Bulgarian economic critics. There are a lot of studies which provide evidence for the influence of the fiscal policy on inflation and the role of the central bank in budget financing.

Prof. Yordanov provides a critical research of the BNB balance sheets, arguing that - since its establishment - the central bank financed the government in various ways and did not keep proper records of this financing (D. Yordanov 1910). His thorough analysis was based on weekly balance sheet data, resulting in the finding that for some periods of time the item "current account of the government" (which usually had a credit balance) was merged with the item "current non-interest bearing accounts" (ending with a debit balance); thus, the BNB balance sheets did not allow to make a precise evaluation of the overall credit to the government. Moreover, he found out that among the credits extended to companies and individuals, some "were guaranteed by the Ministry of Finance or the Minister of Finance himself". (D. Yordanov: 1910: 26).

Another study provides a longer record of the influence of fiscal policy over money creation (St. Bochev 1924). The author made an evaluation of the overall credit to the government based on information from the text of the annual report, analyzing the purposes of various credits extended by the central bank. It turned out that his figures were quite different from the ones reported in the balance sheets, because apart from the direct credit, they also included financing of various public funds, financing provided for public foreign debt service among others. Stoyan Bochev concludes his study on the

BNB as an emission institute with the argument that “the state financial policy dominates BNB emission policy” (St. Bochev 1924: 29).

In his “Course on banking in Bulgaria” at the Economic Department of Sofia University, Prof. Assen Christophoroff stated that George Knapp’s book “State Theory of Money” played a crucial role in the collapse of the Gold Standard and the emergence of fearful inflation in the world (A. Christophoroff 1946: 26). Studying different episodes of the Bulgarian banking system with the BNB playing the central role, he argued that the central bank almost constantly financed the government, reaching its extremes in the war years. Even in periods of time when the BNB was forced to limit its function of banknote emission (during the stabilization), the government enhanced coinage in order to provide the necessary extra revenues from the seigniorage (K. Nedelchev 1940); hence the fiscal policy again interfered in money creation, which was no longer under the control of monetary authority.

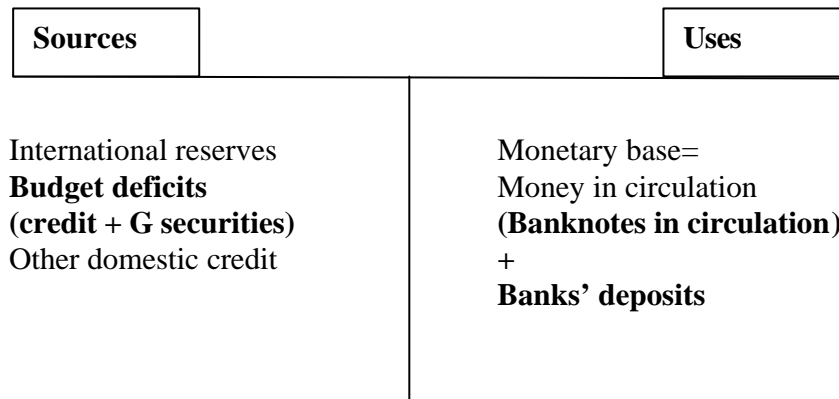
Summarizing various studies dedicated to the interaction between Bulgarian monetary, banking and financial institutions on one hand, and the governments on the other hand, a recent fundamental book argues that the creation and development of the financial system in Bulgaria has been dominated by the state, fiscal policy and communal, municipal needs of financing (R. Avramov 2007).

4.2 Empirical evidence

As mentioned by some contemporaries, there were various ways in which fiscal policy interfered in the money supply and thus determined the rate of inflation. If we look only at the monetization of budget deficits and public debt through the central bank, apart from the conventional direct credit to the government and purchases of treasury bonds, there were also credits extended to state institutions and funds. Moreover, there were credits granted to companies and even individuals which were qualified as “guaranteed” by the Ministry of Finance (D. Yordanov 1910). Last but not least, we should also mention the high share of the BNB profit (around 70% on average) generated predominantly from seigniorage and devoted to the fiscal authorities³.

³ The share is calculated on the basis of information from various issues of BNB Annual reports.

Chart 1. Monetary base decomposition into uses and sources



Looking at the central bank's balance sheet, among all the channels of budget financing elaborated we can construct a series of the BNB financing to the government consisting only of direct credit to the government and treasury bonds. Being aware of the fact that this will not be exhaustive as there are other channels of budget financing independent from the central bank's financing, we will have to consider an alternative indicator for government financial needs. However, studying the government component of the monetary base decomposition into uses and sources (chart 1), which is similar to the money growth accounting analysis employed in the book by Cagan (1965), requires taking into account as many channels of fiscal interference on money creation as possible. Therefore, we should also analyze the overall budget deficit (including extra budget revenues and expenditures) as a major source of fiscal influence on the monetary policy.

In the framework of the monetary base analysis (chart 1), the classification of the uses of the monetary base is not very simple since the BNB acted simultaneously both as an issuing and a commercial bank. Until 1927 there was no requirement for banks' reserve in place and they were not reported separately from the overall demand deposits. Therefore, the monetary base comprises banknotes in circulation until 1927 and banknotes in circulation plus banks' demand deposits since 1927, when trade banks started to maintain accounts at the central bank as a part of the stabilization package.

The first piece of empirical evidence of the relationship between fiscal and monetary policies - considering both the overall credit from the central bank to the government and its impact on inflation - is supposed to be underlying in the development of the respective variables (table 1). Studying the annual growth rates of the monetary base uses (on the liabilities side), credit to the government (on the asset side), and inflation as a resulting variable, we can observe similar behaviour of the three indicators over different periods of times. The overall budget deficit during the Bimetallic standard does not seem to be significant, which might be due to the fact that this balance incorporates extra revenues stemming from the seigniorage of silver coinage. The monetary base and particularly the credit to the government experienced high average growth rates of 65.6% and 83.7% respectively, due to their very low starting levels in absolute terms. Inflation was also comparatively low on average (1.3%), speeding up at the end of the period.

Table 1. Public budget balance, monetary base, credit to the government and inflation

Indicators/periods	Budget balance	BNB credit to the government	Monetary base	Inflation
Bimetallic (1879-1905)	-0.1	83.7	65.6	1.3
Gold standard (1906-1911)	2.6	15.1	20.9	3.6
Inconvertibility and war years (1912-1923)	-7.2	80.7	39.0	30.3
Stabilization (1924-1930)	-7.9	-4.9	1.7	-5.4
Exchange control and WW-II (1931-1945)	-1.2	15.2	79.9	16.1
Whole period	-2.9	44.7	34.1	9.3

Note: Data on monetary base, credit to the government and inflation are reported as annual growth rates (%). Public budget balance is reported as normalized with budget revenues, (%).

During the short-lived Classical Gold Standard, which started to function in 1906 and ended with the outbreak of the Balkan wars in 1912, the budget balance was on average on surplus for the period as a result of provided foreign financing. The credit to the government and monetary base grew at a lower rate as the replacement of coins with fiduciary means of payments (banknotes) resulted in inflation of 3.6% period average. With the outbreak of the Balkan wars in 1912, Bulgaria entered a long period of wars and

inconvertibility. As a result of the extra budget war expenditures, the public budget balance ended with a huge deficit of -7.2% of revenues average for the period. This inevitably required extra financing (80.7%) from the BNB as the foreign capital markets were not accessible. Banknotes in circulation speeded up at 39% period average and resulted in the highest inflation period under study (30.3% period average)⁴.

Stabilization was a very painful period of deflation for the economy, characterized by monetary contraction resulting in 1.7% growth rate on average and leading to a negative inflation of 5.4%⁵. The efforts to put hard budget constraints on the government were obvious in the 4.9% decrease of the overall BNB credit to the fiscal authorities. The inability of the government to serve its huge war debt burden and to put the public finance in order resulted in a negative balance - bigger than the one recorded during the period of inconvertibility.

Soon after the legalization of the monetary stabilization in late 1928, Bulgaria started to experience the first symptoms of the Great Depression and opted for an exchange control regime. The overall budget balance was not extremely negative and the credit to the government grew at the rate of 15.2%, close to the one recorded during the Gold standard. The monetary base, however, grew at quite a faster rate (79.9%) due to the fast accumulating foreign assets held in German currency in blocked accounts, as a result of the clearing agreement with Germany. After overheating the economy, the high devaluation of the German Mark left empty assets on the BNB balance sheet and resulted in high inflation of 16.1% period average in Bulgaria⁶.

Summarizing the development of the indicators for the whole period, it is easy to see that monetary base and the BNB credit to the government grow with somewhat close rates of 44.7% and 34.1% respectively. In other words, we can argue that both were in close relation and that a big amount of the budget financing was carried out through the BNB. There were, however, some periods when the fiscal interferences were not captured by the direct financing provided by the central bank to the government, and when the budget deficit would serve as a better proxy for the finance needs of the public finance.

⁴ The hyperinflation in 1922 recorded 55.3% annual average rate of inflation.

⁵ Nenovsky and Dimitrova (2006) provide more details on the stabilization in Bulgaria.

⁶ In 1945 the annual average inflation was 65%.

The average growth rates, however, are static estimates which do not necessarily characterize every point in time under study.

Another piece of evidence can be found in the application of statistical correlations. Although the cross-correlation matrix (table 2) provides us with comparatively low degrees of correlation for the development of all three variables, we can still rank them. If we look at them closely, we can see that the correlation between the budget balance and monetary base is the highest of all (0.21), followed by the correlation between the monetary base and the BNB credit to the government (0.17), and thirdly by the correlation between the budget deficit and the direct financing provided by the central bank to the fiscal authority (0.15).

Table 2. Correlations of monetary base, budget balance and BNB credit to the government

Correlation coefficient	Budget balance	Monetary base	BNB credit to the government
Budget balance	1	0.21	0.15
Monetary base	0.21	1	0.17
BNB credit to the government	0.15	0.17	1

Note: All variables are normalized with budget revenues, as monetary base and credit to the government represent the first difference of the normalized values.

One explanation for the overall low correlations might be the fact that we consider only banknotes in circulation for the period until the bank deposits appear as a separate item in the BNB balance sheets, while the fiscal impact on money creation is reflected also by the development of coins in circulation. The seigniorage of coinage and particularly of silver coins was a main source of extra budget revenues until banknotes got proper circulation in 1906 (Dimitrova-Fantacci, 2010b).

Furthermore, the limited coverage of the monetary base constrained to the banknotes in circulation and bank deposits might further produce the weak correlation, since the mixture of functions of issuing and trade bank most probably resulted in transfer of resources from other accounts. There are supporting statements for this deduction in some studies which argue that, for a certain period of time, the central bank extended

credits to the government from individuals' deposits at its disposal (D. Yordanov 1910, St. Bochev 1924). Unfortunately, the BNB balance sheets before 1927 do not allow us to study the different components of the aggregatedly reported demand deposits.⁷ On the other hand, as we mentioned above the variable indicating the BNB credit to the government, i.e. direct credit to the government and treasury bonds, is not exhaustive.

Summarizing, the ranking of correlations suggests that the indicator of budget financing carried out through the BNB is really not representative enough for the financial needs of the budget and that the overall budget balance would serve better as a proxy of the fiscal interference in money creation. Although this piece of evidence has the characteristics of the dynamic statistical analysis, the correlation is not strong enough to draw the conclusion that there is a strong fiscal influence on money creation and hence on inflation (E. Joines 1985, p.331).

4.3. Econometric estimation

The econometric estimation of the influence of fiscal policies on inflation through the monetization of public deficits starts with the determination of the direction of causality between the budget balance and the monetary base. Determining the causality relationship is important to ensure that there was fiscal interference in the monetary policy. Otherwise, we can observe positive correlation between government deficits and the growth of the monetary base in the lack of any effect of fiscal dominance (R. Barro 1979). We will apply the Granger test according to which the causality relationship implies that A causes B, if lagged values of A improve the forecast of B (C. Granger 1969)⁸.

⁷ Since 1927 demand deposits have been reported into three components: bank deposits, government deposits and private deposits with average shares in the aggregate indicator of 35.7%, 23.3% and 50% respectively.

⁸ To ensure the validity of the test all variables should first meet the stationarity tests, i.e. both variables are taken as normalized with budget revenues and the monetary base represents the first difference of its normalized values.

Table 3. Granger causality test

Null Hypothesis	F-statistics	Probability
MB does not Granger cause BB	0.15440	0.8573
BB does not Granger cause MB	4.40503	0.0174

The Granger causality test allows us to estimate the causality relationship between both variables simultaneously. According to the rule of thumb, the first row tells us that we cannot reject the null hypothesis that the monetary base does not cause budget deficit. At the same time, we have a rough estimate for the causality relationship from the budget balance towards the monetary base (the second row) as the null hypothesis can be rejected at 1% level. Having estimated this relationship, we can now proceed with providing an estimate of the coefficient of fiscal influence on money creation.

The last piece of evidence is provided by an econometric estimation of the interaction between fiscal and monetary policies. For that purpose we will apply Ordinary Least Squares (OLS) regressions to estimate the simple equation:

$$MB = b_0 + b_1BB + u_t,$$

Where MB stands for monetary base (first difference of normalized values), BB is the overall public budget balance (normalized values), b_0 and b_1 are coefficients, and u_t stands for the residuals. The coefficient of interest is b_1 , which characterizes the relationship between fiscal balance and money creation (table 4)⁹.

The econometric results confirm the existence of fiscal impact on the increase of monetary base for the whole period and, hence, on inflation. The coefficient is high enough (0.66) to argue that there was fiscal dominance over the monetary policy conducted in Bulgaria. The comparatively high adjusted R-squared also suggests that there was a considerable monetization of fiscal debts and that the central bank was dependent on fiscal authorities (R. Avramov 2007).

⁹ The variables are the same as the ones to which the Granger causality test was applied.

Table 4. Econometric results

Period	b_1
Whole period (1889 - 1947)	0.66
t-statistics	4.18
Adj. R-squared	0.78
Bimetallism and Gold Standard (1889-1911)	-0.06
t-statistics	-1.64
Adj. R-squared	0.64
Wars and Interwar years (1912-1945)	0.73
t-statistics	6.28
Adj. R-squared	0.82

For the first sub-period of bimetallic and gold monetary standards, the regression generates a negative and negligible, although statistically insignificant (t-statistics < 2), coefficient of -0.06, suggesting that the fiscal policy was not a determinant of the development of the monetary base, and therefore not an inflationary factor. A possible explanation for this might be the comparatively small sums received by the government through the central bank under these monetary arrangements (A. Christophoroff 1946, 34). Another contending explanation for this negative relationship between budget financing and money creation could be the limited money creation through banknote emissions. In fact, 74% of all the money in circulation until 1914 was represented by silver coins. Coinage, however, was a privilege of the fiscal authorities, hence not presented in the central bank's liabilities, and it was often exercised to derive 50% seigniorage on average to finance the budget directly (Dimitrova-Fantacci 2010b). A persistent agio (a difference between the market and the official silver-to-gold ratio) appeared as a result of this high supply of silver coins, together with the high supply of silver-backed banknotes since 1899 (Dimitrova-Fantacci 2010a). It was not until 1906 that the gold standard was de facto introduced and the banknotes in circulation became a true means of money creation.

As expected, the highest coefficient (0.73) is attained during the war years. War years are usually characterized by a stronger interaction between fiscal and monetary authorities and experience extreme degrees of fiscal dominance (Fратиanni-Spinelli 2001).

For the sake of having a high enough number of observations, the time series also covers the inconvertibility, interwar years (stabilization) and exchange control regime. Integrating the inconvertibility period is justified by the experience of a heavy war debt burden as a consequence of the wars which required financing from the central bank. The exchange control regime covers the years of the Great Depression in Bulgaria when foreign financing was inaccessible, and the strong economic and later political relations with Germany before the outbreak of the Second World War. Only the stabilization period presents a different development of the indicators under study. Although it is a deflationary period, it is short enough and smaller by degrees relative to the rest of the period to change the relationship from positive to negative.

5. Conclusion and policy implications

Applying different research approaches - historical, statistical and econometric - we have found various kinds of evidence – descriptive and empirical - for the fiscal impact on money creation, and hence on inflation. The general outcome of the study indicates that there was a fiscal influence on money creation, which was translated into price increases through the channels of a transmission mechanism.

Studying the interaction between fiscal and monetary policies in different periods characterized by specific monetary arrangements, this impact turned out to be higher during and after times of wars and financial instability, and negligible - if any at all - during the metallic standards. Our results suggest that different monetary regimes allow the presence of fiscal interferences in money creation to different extents. Not surprisingly, the fiscal impact on the monetary base (taking only fiduciary money) is weaker during the Bimetallic and Gold Standard, and during the monetary stabilization in the 20's when the international monetary system was based on rational currencies fixed either to the gold parity or gold exchange ratio. Assuming the parallel between the Gold Standard mechanism and currency board arrangement as appropriate (Desquilbet-Nenovsky 2004), we could argue that the latter one is a regime generating the low 'fiscal' inflation by putting hard budget constraints on government financing.

Although it is still disputable whether and how the fiscal dominance concept can be presented as a theoretical postulate (C. Walsh 2003), it has been put into practice for a long time. Unfortunately, it does not belong only to the past. Fratianni and Spinelli (2001) argue that the whole monetary history of Italy, up to its joining the euro area, is characterized by the constant monetization of budget deficits. Blanchard (2004) provides recent evidence from Brazil as to fiscal dominance under inflation targeting regime. Bulgaria also experienced the consequences of fiscal dominance over money creation at the beginning of its transition period, forgetting its monetary history of the pre-centrally-planned economy. The result was hyperinflation, which was solved by introducing the currency board, enabling the central bank to act as an independent monetary institute and with the hard budget constraint as a first principle.

6. References

- Avramov, R. 1999: 120 Years Bulgarian National Bank, Sofia: BNB.
- Avramov, R. 2007: Komunalniat kapitalizam (Communal capitalism), volumes I, II and III, Sofia: Bulgarian science and culture Foundation (in Bulgarian).
- Barro, R. 1979: On the Determinants of the Public Debt, in: *Journal of Political Economy*, vol. 87, pp. 1095-1117.
- Barro, R. 1987: Government Spending Interest Rates, Prices, and Budget Deficits in the United Kingdom, 1701-1918, in: *Journal of Monetary Economics*, vol. 20, pp. 221-247.
- Blanchard, O. 2004: Fiscal Dominance and Inflation Targeting: Lessons from Brazil, NBER Working Paper No.10389 (May 2004).
- BNB 1929: Jubileen sbornik 1879-1929 (Jubilee Book 1879-1929), Sofia: BNB.
- Bochev, St. 1924: Balgarskata narodna banka kato emisionen, kambialen I krediten institut (Bulgarian National Banks as an emission, exchange rate policy and credit institute) Sofia: AL. Paskalev Publication (in Bulgarian).
- Buiter, W. 2002: The Fiscal Theory of the Price Level: A Critique, in: *The Economic Journal*, vol. 112, pp. 459-480.
- Cagan, P. 1965: Determinants and Effects of Changes in the Stock of Money, 1875-1960, New York: Columbia University Press.
- Christophoroff, A. 1946: Kurs po Balgarsko bankovo delo (Course on banking activities in Bulgaria), Sofia: n.a. (in Bulgarian).
- Desquilbet, J/N. Nenovsky 2004: Credibility and Adjustment: Gold Standards versus Currency Boards, BNB Discussion Paper No.39, Sofia: BNB.
- Dimitrova, K./L. Fantacci 2010a: The establishment of the gold standard in Southeast Europe: convergence to a new system or divergence from an old one?, in: Baubeau P./A. Ögren (eds.): *Convergence and divergence of national financial systems during the gold standards, 1871-1971*, London: Pickering & Chatto Publishers Ltd (forthcoming).
- Dimitrova, K./L. Fantacci 2010b: Financial stability, monetary autonomy and fiscal interference: Bulgaria in search of its way 1879-1913, in: *Economic and Financial Stability in Southeastern Europe in a Historical and Comparative Perspective*, National Bank of Serbia Conference Proceedings' Volume, Belgrade: NBS (forthcoming).
- Fратиани, M./F. Spinelli 2001: Fiscal Dominance and Money Growth in Italy: The Long Record, in: *Explorations in Economic History*, vol. 38, pp. 252-272.
- Granger, C. 1969: Investigating Causal Relations by Econometric Methods and Cross-spectral Methods, in: *Econometrica*, vol. 37, pp. 424-438.
- Grilli, V. 1989: Exchange Rates and Seigniorage, in: *European Economic Review*, vol. 33, pp. 580-587.
- Joines, D. 1985: Deficits and money growth in the United States 1872-1983, in: *Journal of Monetary Economics*, vol. 16, pp. 329-351.
- King, R./C. Plosser 1985: Money, Deficit, and Inflation, in: *Carnegie-Rochester Conference Series*, vol. 22, pp. 147-196.
- Kiosseva, N. 2000: Istorija na parichnite krizi w Balgaria, 1879-1912 (History of the monetary crises in Bulgaria, 1879-1912), Sofia: Economic University Press (in Bulgarian).

- Leeper, E. 1991: Equilibria under 'Active' and 'Passive' Monetary and Fiscal Policies, in: *Journal of Monetary Economics*, vol. 27, pp. 129-147.
- Mankiw, G. 1987: The Optimal Collection of Seigniorage: Theory and Evidence, in: *Journal of Monetary Economics*, vol. 20, pp. 327-341.
- McCallum, B. 2001: Monetary Policy Analysis in Models Without Money, *Review of the Federal Reserve Bank of St. Louis* (July/August), pp. 145-160.
- Nedechev, K. 1940: *Parichnoto delo v Bgaria, 1879-1940* (Monetary activities in Bulgaria, 1879-1940), Sofia: Knipegraph Printing House (in Bulgarian).
- Nenovsky N./K. Dimitrova 2006: Exchange Rate and Inflation: France and Bulgaria in the Interwar Period, in: Avramov, R./S. Pamuk (eds.): *Monetary and Fiscal Policies in South-East Europe. Historical and Comparative Perspective*, Sofia, BNB.
- Nenovsky, N./K. Dimitrova 2007: *Exchange Rate Control in Bulgaria in the Interwar Period: History and Theoretical Reflections*, BNB Discussion Paper No. 61, Sofia: BNB.
- Sabate, M./M. Gadea/R. Escario 2004: Does fiscal policy influence monetary policy? The case of Spain, 1874-1935, in: *Explorations in Economic History*, vol. 43, pp. 309-331.
- Sims, Chr. 1994: A simple model for the study of the determination of the price level and the interaction of monetary and fiscal policy, in: *Economic Theory*, vol. 4, pp. 381-399.
- Walsh, C. 2003: *Monetary Theory and Policy* (Second edition), London: MIT Press.
- Woodford, M. 1995: Price Level Determinacy without Control of a Monetary Aggregate, in: *Carnegie-Rochester Conference Series on Public Policy*, vol. 43, pp. 1-46.
- Woodford, M. 2001: Fiscal Requirements for Price Stability, in: *Journal of Money, Credit and Banking*, vol. 33, pp. 669-728.
- Yordanov, D 1910: *Balgarskata Narodna Banka 1879-1908* (Bulgarian National Bank, 1879-1908), Sofia: Liberalni klub Printing House (in Bulgarian).