

MACROECONOMIC POLICY COORDINATION APPROACH UNDER CURRENCY BOARD ARRANGEMENTS IN BULGARIA

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Introduction

Since the introduction of the Currency Board Arrangements (CBA) in Bulgaria in 1997, the options for implementing macroeconomic stabilization policy has been severely limited due to the imposed monetary policy constraints to the Bulgarian National Bank (BNB) and the need a prudent fiscal policy to be pursued so as not to be jeopardizing the functioning of the monetary regime. After joining the EU the fiscal rules imposed by the Stability and Growth Pact, the EU Macroeconomic Imbalances Procedure and at local level by the Public Finance Act also restrained the policymakers. In such a monetary regime framework, where the BNB can only change the minimum reserve requirements from the conventional monetary policy instruments the fiscal policy should be committed to low budget deficits and sustainable government debt levels (Zaimov&Hristov, 2002). Therefore, the coordination of monetary and fiscal policy in Bulgaria is a prerequisite for a stable functioning of the CBA. The combined effect of fiscal and monetary policy instruments on the Keynesian multiplier is also an important prerequisite for their coordination and shows that the effects on the real sector directly depend on the synergy between the two policies (Ignatov, 2016).

The global financial and economic crisis of 2007-2008 has also changed the views on and the ways of implementing and coordinating macroeconomic policy. Under low inflation and continuously maintained low interest rates, monetary policy turned out to be significantly limited, which called for large-scale fiscal grants worldwide. The danger of falling into a situation of insolvency and debt crises in some countries generated the necessity for maintaining fiscal and monetary buffers as an important prerequisite for conducting macroeconomic stabilization policies (Blanchard, Dell'Ariccia & Mauro, 2010). Such buffers are fiscal reserves, not excessive public debt and not very low interest rate that can be further reduced if economic activity slowed down. Meanwhile, the goals of macroeconomic policy predominantly based on monetary policy dominance

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proved to be too limited to provide real economy effects (Blanchard, 2011), which require its rethinking and recognizing the potential of fiscal policy to be used for income stabilization (Romer, 2011).

Recognizing the growing importance of coordinating macroeconomic policies, both nationally and globally, we offer an original approach for evaluating the interaction of fiscal and monetary policies under CBA. The approach makes it possible the required level of coordination between fiscal and monetary policy to be determined not only in terms of stimulation of real and external sectors of the economy (macroeconomic stabilization function), but also from the point of view of stability of fiscal and monetary sectors themselves. The method is tested empirically for Bulgarian economy in 2009-2016 and the results are commented on so as to allow for making recommendations for conducting national macroeconomic policy. The approach proposed can be used both for the purposes of conducting macroeconomic policy by the government and the central bank, as well as for its analysis and evaluation.

An approach for coordination of macroeconomic policies under Currency Board Arrangements

The essence of the approach is in determination of the values of the budget balance and minimum reserve requirements that make it possible for the fiscal and monetary policy targets for economic growth and inflation to be carried out without changing other variables of budgetary constraints on economic sectors. We assume the budget balance to be an appropriate indicator for conducted fiscal policy which reflects the net effect of changes in government revenue and government spending. Although structural budget balance is more suitable indicator for conducted fiscal policy, we use budget balance because its simpler derivation from the cross-sectional macroeconomic identities described in the European System of Accounts 2010, more simplified estimation and short-run aspects of analysis. We also use the minimum reserve requirements that is the only conventional instrument of monetary policy in Bulgaria under CBA.

Let us assume that the cross-sectional macroeconomic identities of the economic sectors, i.e. fiscal sector (FS), monetary sector (FM), foreign sector (FF) and real sector (FP), are based on economic and financial accounts by institutional sector in accordance with the European System of Accounts 2010. We also assume that the goals of fiscal and monetary policy are real GDP (\bar{Y}_t) and inflation ($\bar{\pi}_t$), which are set exogenously by the government and the central bank. Within these limits cross-sectional macroeconomic identities, expressed as a function of the budget balance (BS_t), minimum reserve requirement ratio (rd_t), real GDP (\bar{Y}_t) and inflation ($\bar{\pi}_t$) may be presented in analytic form in the following way:

$$FS: A_1 BS_t = A_2 rd_t + A_3 (1 + \bar{\pi}_t) \bar{Y}_t + A_4$$

$$FM: B_1 BS_t = B_2 rd_t + B_3 (1 + \bar{\pi}_t) \bar{Y}_t + B_4$$

$$FF: C_1 BS_t = C_2 rd_t + C_3 (1 + \bar{\pi}_t) \bar{Y}_t + C_4$$

$$FP: D_1 BS_t = D_2 rd_t + D_3 (1 + \bar{\pi}_t) \bar{Y}_t + D_4$$

where A_1 , B_1 , C_1 and D_1 are parameters that include all variables of budget constraints of economic sectors that depend directly on the government balance; parameters A_2 , B_2 , C_2 and D_2 include variables of budget constraints of economic sectors whose value depend on the minimum reserve requirements; A_3 , B_3 , C_3 and D_3 are parameters unifying variables that depend on real income and inflation in budget constraints of economic sectors; A_4 , B_4 , C_4 and D_4 are all other variables in the cross-sectional macroeconomic constraints which do not depend on the tools and goals of fiscal and monetary policies.

Using the presented form of the cross-sectional macroeconomic identities we aim at determining the macroeconomic policy mix in terms of real and foreign sectors (macroeconomic policies stabilization function) and fiscal and monetary sectors (stability of both sectors) that have met the exogenously set targets for real income and inflation by the government and the central bank. The values of budget balance and minimum reserve requirements that satisfy the exogenously set goals for economic growth and inflation without changing other variables of budgetary constraints on economic sectors define a model budget balance (BS_t^*) and a model minimum reserve requirement ratio (rd_t^*). Based on comparative statics approach the model budget balance (BS_t^*) is determined by the exogenously set goal of the government for real GDP (\bar{Y}_t) and the exogenously set goal of the central bank for inflation ($\bar{\pi}_t$) and actual minimum reserve requirement ratio (rd_t), as well as all other variables included in the already presented versions of the budget constraints of the economic sectors as a system of simultaneous equations. Similarly, the model minimum reserve requirement ratio (rd_t^*) are also determined by the targeted real GDP by the government (\bar{Y}_t), the central bank goal for inflation ($\bar{\pi}_t$), the budget balance (BS_t) as reported by the statistics and all other values of the variables in the budget constraints of economic sectors.

This allows us to examine what the fiscal policy should be at fixed targets for economic growth and inflation if the parameters of monetary policy are set exogenously and it is not possible for the government to affect central bank decisions. Such an assumption is realistic under the framework of the CBA in Bulgaria and the prohibition of monetary financing of budget deficits in the European Union. Similarly, we can assess what the monetary policy should be when exogenous goals of macroeconomic policy are set, i.e. what the value of

the minimum reserve requirement ratio should be, if the central bank adopts the current budget balance for a target of fiscal policy.

By applying such an approach, it is possible to define the macroeconomic policy mix that enables the government and the central bank to achieve their goals for real GDP and inflation. The same can be done from the perspective of the real and external sector by identifying what level of interaction (i.e. budget balance and reserve requirements) needs to be established between the government and the central bank so that their stabilization function to the economy is achieved in the preset values of the variables of the budget constraints of the real and foreign sector. Therefore, the approach can be used as a guide for the desired level of coordination of fiscal and monetary policy. In analytical type this opportunity becomes visible by:

- system of linear equations for solving the model values for budget balance and minimum reserve requirement ratio that comply with the goals of the government and the central bank for economic growth and inflation without any changes in values of the variables of the cross-sectional macroeconomic identities of the fiscal and monetary sector:

$$\begin{aligned} FS: A_1 BS^*_{t-1} &= A_2 rd^*_{t-1} + A_3 (1 + \bar{\pi}_t) \bar{Y}_t + A_4 \\ FM: B_1 BS^*_{t-1} &= B_2 rd^*_{t-1} + B_3 (1 + \bar{\pi}_t) \bar{Y}_t + B_4 \end{aligned}$$

- systems of linear equations for solving the model budget balance and minimum reserve requirement ratio that comply with the exogenous goals for real GDP and inflation without any changes in variables describing economic agents behaviour (households and corporations):

$$\begin{aligned} FF: C_1 BS^*_{t-1} &= C_2 rd^*_{t-1} + C_3 (1 + \bar{\pi}_t) \bar{Y}_t + C_4 \\ FP: D_1 BS^*_{t-1} &= D_2 rd^*_{t-1} + D_3 (1 + \bar{\pi}_t) \bar{Y}_t + D_4 \end{aligned}$$

It is worth noting that we use a lagged values for budget balance and minimum reserve requirements that allows the time needed the measures of the two policies to be transmitted to be taken into account. Moreover, the different values of the instruments of fiscal and monetary policies from the two systems of equations in pursuit of same macroeconomic goals for real GDP and inflation allows the *dual nature of fiscal and monetary policy* to be taken into consideration – once depending on whether their achievement is related to the fulfillment of the stabilization macroeconomic function to the real and the external sector and second, whether the stability of fiscal and monetary sectors is preserved.

The assessment of macroeconomic policy using the proposed approach is based on the evaluation criteria on their expansionary, neutral or restrictive nature. To determine the macroeconomic policy type we apply a modified approach of the fiscal and monetary policies indices used in the study of systemic banking crises in 1970-2007 (Laeven&Valencia, 2008). Based on the above-mentioned specifics

of the approach concerned, we use the budget balance and minimum reserve requirement ratio differential from their model values one year before. Therefore, the criteria for assessing the type of macroeconomic policies is as follows:

- if $BS_{t-1} - BS^*_{t-1} > 0$, where BS_{t-1} is the budget surplus as reported by the official statistics and BS^*_{t-1} is its model value according to the approach we employ, it is necessary a looser fiscal policy to be conducted;
- if $BS_{t-1} - BS^*_{t-1} < 0$, a more restrictive fiscal policy is recommended;
- if $BS_{t-1} - BS^*_{t-1} = 0$, a change in the fiscal policy is not recommended and:
- if $rd_{t-1} - rd^*_{t-1} > 0$, where rd_{t-1} is the value of the minimum reserve requirement ratio set by the central bank one period ago and rd^*_{t-1} is its model value, an expansionary monetary policy in the previous period should be conducted;
- if $rd_{t-1} - rd^*_{t-1} < 0$, the central bank should pursue a more restrictive monetary policy;
- if $rd_{t-1} - rd^*_{t-1} = 0$, monetary policy in the previous period was neutral.

The described approach allows for a normative assessment of fiscal and monetary policies when comparing the budget balance reported by the official statistics and the minimum reserve requirement ratio with their model values for each of the economic sectors. That's how we can outline what the interaction between the two macroeconomic policies should be so as to strike a balance between their fundamental economic goals of economic growth and inflation and maintaining sustainable fiscal and monetary development.

Testing of the approach and macroeconomic policy mix recommendations

The proposed approach is tested in 2009-2016 when comparable data are available for all the variables included in the budget constraints of the economic sectors in Bulgaria. This period is also suitable because it covers both the manifestation of the global financial and economic crisis of 2008-2009 and the following economic recovery in Bulgaria. We assume that fiscal policy should target 4% real GDP growth, which is about 2 times higher than the average economic growth in Bulgaria in 2010-2018 and nearly 4 times higher than the average economic growth of the euro area for the same period. Although this target for economic growth is still low for a sustainable convergence to the euro area, we assume it is realistic having in mind the economic slowdown in the years following 2008 and 2009 and the limited potential GDP growth as reported

in Zlatinov (2019). We assume that the target of monetary policy is an inflation rate of 2% which coincides with the goal of the European Central Bank for price stability in the euro area. For the successful implementation of the approach and calculation of model budget balance and model minimum reserve requirement ratio we estimate econometrically 27 behavioral coefficients, 32 parameters of the budget constraints of economic sectors and 16 simultaneous systems of linear equations using the Least Squares Theorem. The estimation techniques and the values of behavioural coefficients and parameters are presented in Zlatinov, D. (2015), Interaction between fiscal and monetary policy under floating exchange rate and CBA.

Table 1. Model values of budget balance and minimum reserve requirement ratio according to the approach for coordinating macroeconomic policy in Bulgaria

Year	Registered BS (% of GDP)	Registered rd (%)	BS* (% of GDP)	rd*	Differential (BS-BS*)	Policy type			Differential(rd-rd*)	Policy type			BS* (% of GDP)	rd*	Differential (BS-BS*)	Policy type			Differential (rd-rd*)	Policy type		
			Fiscal and monetary sector									Foreign and real sector										
2009	-4,1	10	-1,4	6	-2,7	R	4	E	-4,3	12	0,2	E	-2	R								
2010	-3,1	10	0,6	8	-3,7	R	2	E	-4,0	7	0,9	E	3	E								
2011	-2,0	10	1,2	4	-3,2	R	6	E	-3,1	11	1,1	E	-1	R								
2012	-0,3	10	0,5	3	-0,8	R	7	E	-2,4	4	2,1	E	6	E								
2013	-0,4	10	0,7	2	-1,1	R	8	E	0,5	2	-0,9	R	8	E								
2014	-5,4	10	2,3	12	-7,7	R	-2	R	-0,8	2	-4,6	R	8	E								
2015	-1,7	10	1,3	14	-3,0	R	-4	R	-1,5	8	-0,2	R	2	E								
2016	0,2	10	4,5	15	-4,3	R	-5	R	-0,9	9	1,1	E	1	E								

Note: The positive difference between the registered budget balance and its model value suggests that it is recommended for the government to pursue a more expansionary fiscal policy and vice versa; a positive difference between the reported minimum reserve requirements rate and its target value suggests the central bank to pursue a looser monetary policy, and vice versa. Conducting

expansionary policy is marked "E", restrictive policy is marked with "R", and a neutral policy with "N".

Before the manifestation of the global financial and economic crisis of 2008-2009 in Bulgaria, a budget surplus was maintained as a priority, combined with an increase in minimum reserve requirements in 2006 to 12% which was subsequently reduced to 10% in 2008. After the crisis, the Bulgarian government began to keep a budget deficit gradually reduced by 2012 that rose sharply in 2014 due to one-off effects of financial sector fragilities. The monetary policy was a neutral one as the minimum reserve requirement ratio of 10% was maintained constant since 2008. Thus we can conclude that the macroeconomic strategy under the CBA in Bulgaria in 2009-2016 was a combination of restrictive fiscal policy with a consistent reduction of budget deficit and neutral monetary policy.

The approach we employ shows that in 2009-2016 a more expansionary fiscal policy was pursued in Bulgaria than the preserving of budget sector stability required whereas the monetary policy was too restrictive in 2009-2013. This indicates that in the period of still fragile economic recovery the central bank acted preventively. Meanwhile, the constant reserve requirement ratio in 2014-2016 should be increased taken into account the problems in the financial sector following the bankruptcy of the Corporate Commercial Bank.

In order stability of public and monetary sector to be preserved in Bulgaria in 2009-2016 a more restrictive fiscal policy had to be pursued, combined with a greater utilization of capabilities of monetary policy. However, the government conducted counter-cyclical fiscal policy in order to offset BNB pro-cyclical monetary policy, which prioritizes much more the retention of the monetary regime than direct economic stimulus, especially around the turmoil in the financial sector in 2014. Hence, the limitations imposed by the CBA on monetary policy in Bulgaria puts the fiscal stability at risk when the government targets higher economic growth and tries to offset the neutral monetary policy.

When assessing fiscal and monetary policy implications on the real sector of the economy, we find that fiscal policy was predominantly restrictive in 2009-2012 while monetary policy should be looser after 2012. However, the recommended combination includes expansionary fiscal policy and neutral monetary policy (alternating restrictive and expansionary monetary policy according to the approach proposed) until 2012 and restrictive fiscal policy and expansionary monetary policy since then. This shows that the recommended macroeconomic policy mix depends on the business cycle phase. It also demonstrates the dual function of macroeconomic policies and the importance of their coordination despite the CBA limitations. The approach suggests fiscal policy should not be only committed to preserve the monetary stability but it should be also occupied with measures to stimulate economic growth which may put the fiscal stability at risk when supportive monetary policy misses. Moreover, the threats to fiscal

stability are assessed equally negatively by the proposed approach for both fiscal sector and real sector of the economy and results in a recommendation for more expansionary monetary policy since 2012.

Therefore, the BNB should take a much more active role in conducting macroeconomic stabilization policy and partially offset the necessary restrictive fiscal policy. However, it would obviously risk financial sector stability where the approach we employ shows restrictive measures were needed. In this situation the BNB abstained from changing the minimum reserve requirement ratio probably due to the commitment the stability of the currency regime to be maintained as well as by the lack of monetary policy instruments to suppress possible adverse effects on the economy. Nevertheless, Velushev (2018) confirms the need for a more active role of the BNB in the economic life despite the CBA constraints. The approach we test also signals a much larger role the BNB should play and give reasons for seeking a bigger place for financial sector in overcoming the negative economic and social impact of the global financial and economic crisis through reducing the minimum reserve requirement ratio by the BNB and expanding the credit activity of commercial banks.

Conclusion

The empirical results from testing the approach for assessing the interaction between fiscal and monetary policies in Bulgaria in 2009-2016 shows that Bulgarian authorities are recommended to pursue a monetary policy more committed to fostering economic growth which would not be in contradiction with the principles of the CBA. The very idea of monetary policy options under the CBA should be changed and the notion that under current monetary regime Bulgaria is totally deprived of monetary policy instruments for macroeconomic stabilization should be overcome. This would result in greater coordination between fiscal and monetary policies and joint responsibility for the convergence of the Bulgarian economy with the countries of the euro area.

We take into account that frequent changes in monetary policy measures may risk the stability of the monetary regime and may present a hazard for established CBA. The lack of additional monetary policy instruments to mitigate such effects as well as insufficient theoretical arguments about the effectiveness of changes in the minimum reserve requirements would also be grounds for a limited manipulation by minimum reserve requirements by the central bank. However, catching-up economic development is also within the mandate of the central bank when real GDP per capita in Bulgaria is 50% of the EU average in 2018. More decisive steps are needed the big income differences with the euro area economies to be overcome and the BNB should also commit itself to this aim. Thus, Bulgarian economy will be better equipped to join the euro area.

Last but not least, the approach suggests a balance between maintaining fiscal discipline and the accumulation of enough buffers for the sustainable functioning of the CBA should be achieved. Such a balance would allow untapped potential and accumulated liquidity in the banking sector to be absorbed (the total savings in the economy amount to about 70% of GDP in 2018), the required restrictive nature of the fiscal policy under CBA to be maintained and Bulgarian economy to move closer to the euro area.

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Abstract

The paper presents the logics and empirical results from testing an original approach for assessing the interaction between fiscal and monetary policies in Bulgaria in 2009-2016. Methodologically the approach is based on combinations of the budget balance and the reserve requirement ratio that satisfy pre-defined cross-sectional macroeconomic identities. Applying it we find that the monetary policy in Bulgaria is predominantly oriented to preserve the stability of the currency regime than stimulating real economy, while the government should find the delicate balance between maintaining the public sector stability and promoting economic development.

Key words: macroeconomic policy coordination, policy mix, Currency Board Arrangements, cross-sectional macroeconomic identities, goals of fiscal and monetary policies

JEL: E61, E63, C5