Investigating the Cyclical Behavior of Fiscal Policy in the Republic of Macedonia during the Period of Transition

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Abstract

The main aim of this research is to investigate the cyclical behavior of fiscal policy with respect to output gap fluctuations in the Republic of Macedonia during the period 1991-2009. We use two different fiscal policy measures: 1) the cyclically unadjusted primary budget balance and 2) the cyclically adjusted primary budget balance as a proxy indicator of the fiscal policy stance. This analysis also aims to explore whether there was a substantial change in the fiscal policy behavior prior to 1996 due to the turbulent initial period of transition and the switch in monetary policy strategy. We additionally control for other factors that also seem to have had a significant impact over the fiscal policy behavior, such as the armed conflict in 2001 and the impact of public debt as a proxy indicator of budget financing constraints. The estimated results with respect to both measures, the cyclically unadjusted and cyclically adjusted budget balance,

indicate differences in the fiscal policy behavior prior to and after 1996. More precisely, the results imply that the fiscal policy behavior prior to 1996 was procyclical, whereas afterwards the fiscal policy became countercyclical. These results are robust to different measures of the output gap and different frequency of the data sets.

Keywords: fiscal policy, cyclically adjusted balance, output gap, monetary policy change

JEL classification: C35, D10, I31, P20

1 Introduction

Although the cyclicality of fiscal policy is explored quite extensively for developed and developing economies, the existing literature for the case of Southeastern European economies is rather limited. Hence, this research, that examines the behavior of fiscal policy in the case of the Republic of Macedonia (RM), may contribute to the literature in this respect. It explores whether fiscal policy authorities have taken the appropriate policy measures in reducing economic fluctuations. This may provide important answers on how fiscal policy is conducted, whether it has had a stabilizing role over the business cycle in Macedonia and how the turbulent initial period of transition and the different monetary policy regime may have affected the fiscal policy behavior.

For assessing the fiscal position vis-à-vis the economic cycle, we use the cyclically unadjusted primary budget balance and the cyclically adjusted primary budget balance as indicators of the fiscal policy stance. Additionally, we explore the differences in the fiscal policy prior to and after 1996, controlling for the turbulent initial transition period, the unstable macroeconomic environment and the different monetary policy regime applied prior to 1996. Moreover, we include other control variables that also seem to have had an influence over the

fiscal policy behavior, i.e., the armed conflict in 2001 and budget financing constraints (by using the initial stock of public debt as a proxy).

The added value of this research is as follows: first, this is one of the first empirical analyses that investigate the cyclical behavior of fiscal policy in the RM, as far as we are aware. Second, it controls for the unstable transition environment and the different monetary policy regime applied prior to 1996, as well as other factors, such as the armed conflict in 2001 and budget financing constraints.

The major finding of this research is that there has been a substantial change in the fiscal policy behavior after 1996. More precisely, the results point to a procyclical fiscal policy behavior prior to 1996 and a countercyclical one afterwards. This may suggest that the uncertain macroeconomic environment as well as the type of monetary policy regime applied may have had a significant influence over the type of fiscal policy employed. This finding may also be generalized for other Southeastern European economies, especially those that have also had a shift in their monetary policy strategy towards a *de facto* fixed exchange rate and/or currency board such as Croatia and Bulgaria for example. Furthermore, the results indicate that additional significant control variables over the fiscal policy behavior in the RM are the one for the armed conflict in 2001 and for the budget financing constraints measured through the stock of public debt.

This paper is structured as follows: Section 2 surveys the literature. In Section 3, we provide some stylized facts about the Macedonian economy and the fiscal policy. The model and the estimation method, as well as the data description are presented in Sections 4 and 5, respectively. The assessment of the results is provided in Section 6, whereas the summary of the findings is given in the final section.

2 Literature Overview

The role of fiscal policy in stabilizing the economic cycle is the subject of numerous theoretical and empirical studies. According to the normative approach, fiscal policy should react in a countercyclical manner in order to reduce output gap fluctuations (Mackiewicz, 2008). For instance, a countercyclical fiscal policy in expansionary phases (positive output gap) would tend to increase the budget surplus or reduce the budget deficit and vice versa during recession periods (negative output gap). The theoretical background for this normative recommendation can be found in the "standard" Keynesian approach. More precisely, the Keynesian approach principally argues for countercyclical budget expenditures that would smooth economic fluctuations, as there is no possibility of automatic return of the economies to their equilibrium. On the other hand, the "tax smoothing" hypothesis of Barro (1979) points to the need to maintain a constant relationship between taxes and income, i.e., to maintain constant effective tax rates and a balanced budget in the medium and long term.

The stabilization function of fiscal policy is achieved through: 1) the automatic reaction of budget revenues and expenditures to the economic cycle (automatic stabilizers) and 2) a discretionary component. Automatic stabilizers represent parts of the revenues and expenditures that automatically adjust to cyclical changes in the economy. For example, in times when output is falling, declines in income induce lower tax revenues, while the expenditures for unemployment benefits grow (Baunsgaard and Symansky, 2009). Thus, we can say that automatic stabilizers are structural features of the taxation system and budget spending which alleviate fluctuations in disposable income, affecting consumption and investment over the cycle. In addition, most of the literature indicates a need to limit the cyclical fiscal policy response solely to automatic stabilizers, while highlighting the weaknesses of the discretionary part of fiscal policy. The disadvantages of discretionary fiscal policy mainly refer to: 1) long time lags of the fiscal policy implementation and 2) the fact that discretionary measures are

not automatically withdrawn, which increases the probability of continued high budget deficits.

In practice, for many developing countries there is empirical evidence that fiscal policy is procyclical. Gavin and Perotti (1997) provide evidence for procyclical fiscal policy on a sample of Latin American countries and a countercyclical fiscal position in industrialized countries. Additionally, they provide some indications of asymmetric fiscal response in industrialized countries at different stages of the economic cycle, i.e., the countercyclical fiscal behavior is more pronounced in bad times, and less expressed in good times. In contrast, for the group of countries in Latin America, the authors come to the opposite conclusion, indicating greater fiscal response in expansionary times and lower in times of recession.

Lane (2003) empirically explores the cyclical behavior of fiscal policy in OECD countries, within the period of 1960-1998. He examines the cyclical reaction of different budget spending components. The results point to a relatively mild countercyclicality of total current spending, but also to a procyclical reaction of public consumption, which implies that built-in automatic stabilizers in the social transfers component may drive the countercyclical behavior of current spending. Strong procyclical behavior is evident for public investments, while for total spending the results point to an acyclical response. This study additionally contributes to the existing literature by emphasizing different responses in the individual countries (both in terms of the intensity and the direction of the responses), meaning that both pro- and countercyclical fiscal policy behavior may exist within the group of developed economies.

Talvi and Vegh (2005) examine different types of fiscal policy behavior between developed and developing economies. The results for G-7 countries indicate close-to-zero correlation between public consumption and GDP, implying an acyclical fiscal policy reaction. In contrast, the results for a sample of 36 developing economies point to a procyclical fiscal policy response. They identify that the different volatilities in the tax base are the cause of divergent fiscal policy

reaction functions in the two groups of economies. The large tax base fluctuations in developing countries imply large surpluses in expansions and large deficits in recessions. However, this may not hold in reality, as very often the large surpluses, under political pressures, are used for spending and not for repayment of debt. Hence, during expansions, fiscal authorities in developing countries frequently reduce the tax burden, leaving the excess funds to the private sector.

Kaminsky, Reinhart and Vegh (2004) estimate the cyclical response of capital flows, monetary and fiscal policy on a sample of 104 countries. With respect to fiscal policy, they test the hypothesis for countercyclical or acyclical behavior in OECD countries and procyclical behavior in developing economies. Their research is in line with the hypothesis that in economies other than OECD countries, fiscal policy follows a procyclical pattern. A consistent conclusion is provided by Ilzetzki and Vegh (2008). The study, based on a sample of 49 countries for the period of 1960-2006, using various econometric methods, offers strong evidence for procyclical fiscal policy in developing countries. What is more, in contrast to the existing literature, this study offers evidence for procyclicality in high-income countries. Abdih et al. (2010) analyze the cyclical properties of fiscal policy on a sample of 28 countries in the Middle East and Central Asia in the last four decades. They also try to disentangle a possible change in fiscal behavior before and during the latest crisis in 2009. They provide evidence for a procyclical fiscal pattern prior to the crisis and a countercyclical behavior during the crisis.

In general, the results of the various studies assessed in this section indicate a countercyclical fiscal policy behavior in developed economies and a procyclical behavior both in developed and emerging economies. Nonetheless, empirical literature that analyzes fiscal policy behavior in the transition economies of Southeastern Europe is quite scarce. Hence, this study, by analyzing fiscal policy in the case of the Republic of Macedonia, should enrich the empirical investigation for this group of economies.

3 Stylized Facts: Fiscal Policy in the Republic of Macedonia

Fiscal policy in the RM has played a very important role in establishing and maintaining macroeconomic stability. Consolidation of fiscal finances was one of the crucial factors for taming the hyperinflation present in the early phases of transition to a market economy. Expenditure pressures stemmed from a need to introduce new functions of the independent state, implement structural reforms and raise social expenditures due to the falling economic activity. On the other hand, budget revenues declined in an environment of economic contraction and widespread tax evasion. In 1993 the central government budget[1] reached a record-high deficit of 13.4 percent of GDP, in large part due to the social funds deficit, and was mainly financed by accumulation of arrears.

The consolidation of fiscal finances started in 1994 within the framework of the Stabilization Program adopted by the Government and supported by the International Monetary Fund and the World Bank (for details see IMF Staff Report, 1994-2008). Thus, the various implemented fiscal measures led to a significant reduction in the central government budget deficit to 2.7 percent of GDP in 1994 (see Appendix 1), while the core government budget balance was positive[2] (1.7 percent of GDP). Since then, the fiscal position has been kept prudent with the budget deficit below the Maastricht criteria of 3 percent of GDP. Exceptions were 2001, the year in which the internal armed conflict occurred, and 2002, when fiscal effects of the internal conflict were still felt.[3] On average, from the country's independence until 2009, the central government deficit was 2.5 percent of GDP, whereas the core government budget deficit was 0.8 percent of GDP, and primary core government balance was in surplus (0.6 percent of GDP). In line with the relatively low budget deficits and sizable privatization

1 The central government budget refers to core government and extra budgetary funds.

2 The presented data are not fully consistent with the official Ministry of Finance statistics and IMF Government Statistics for the RM, as the computation is done by the authors, according to GFS for the whole period.

3 The budget expenditures related to the armed conflict amounted to 5.9 percent and 2.2 percent of GDP in 2001 and 2002, respectively.

revenues, the public debt level remained below the Maastricht criteria of 60 percent of GDP.[4] The highest level of public debt was reached in 2000 (57 percent of GDP, see Appendix 2) when the Government issued a bond for so-called "frozen foreign currency deposits", i.e., for household deposits that had remained in ex-Yugoslav banks. After that, public debt was on a declining path, with the exception of 2005 when the first eurobond was issued. On average, public debt amounted to 42 percent of GDP, and it was dominantly external.

In the 19 years under analysis, central government revenues on average amounted to 36 percent of GDP (see Appendix 1), though there was quite a wide variation in their size, reflecting reforms of the tax system, cycles in the economic activity and use of the tax policy as a macroeconomic instrument. Excluding social security contributions, revenues on average amounted to about 22 percent of GDP. The gap between the central government and core government revenues was even larger at the beginning of transition, while it was significantly narrower in later years. Tax revenues (including social security contributions) on average amounted to 33 percent of GDP, and the value-added tax (VAT), which was introduced in 2000, substituting the sales tax, was one of the main sources of budget revenues. The tax burden was generally more in favor of indirect taxes, while the taxation on incomes was lower, and has narrowed recently as a result of imposed tax reforms.

The spillover effects of the global crisis were felt in the fiscal sector of the Macedonian economy through a substantial decline in corporate profits and profit tax revenues. A contraction in personal consumption also led to lower VAT and import taxes. Despite the automatic adjustment of revenues, the Government also implemented discretionary revenue measures in order to mitigate the negative trends in the real sector.

Central government expenditures in the period of 1991-2009 on average amounted to around 39 percent of GDP (see Appendix 1). The size of budget expenditures was quite variable (from 32 percent to 53 percent of GDP), reflecting

4 Data on public debt prior to 1999 are not publicly available.

the external and internal political and economic shocks that hit the Macedonian economy, expenditure policy reforms and the use of expenditures as one of the main macroeconomic instruments. Core government budget expenditures were lower, on average 24 percent of GDP. The highest ratio of central government expenditures to GDP was registered during 2001-2002, driven mainly by expenditures related to the armed conflict. During the recent crisis in 2009, the increased government spending acted countercyclically through the anti-crisis measures taken by the Government. More precisely, an increased share of current expenditures in GDP in 2009 was to a great extent offset by a reduction in the share of capital expenditures, and consequently the overall level of expenditures remained stable.

For the analyzed period, the expenditure structure was not favorable as it was dominated by current expenditures that on average accounted for 36 percent of GDP (or 93 percent of total expenditures). Transfers, largely including social transfers, accounted for almost two thirds of total expenditures, implying low discretionary room for fiscal policy. Capital expenditures were low, around 3 to 7 percent of GDP, even though the level of infrastructural development was modest and there were rising needs for public investments. However, since 2000 there has been an increasing trend of capital expenditures that can be partly explained by the Government's program to use privatization inflows for financing capital expenditures.

Overall, fiscal policy in the RM was focused on achieving and maintaining macroeconomic stability as a precondition for long-term sustainable growth. The need to have a coordinated macroeconomic policy mix in support of price and exchange rate stability, in principle, limits the possibility of using fiscal policy as a tool for short-term economic stabilization. Thus, when assessing the role of fiscal policy in stabilizing the output gap, it is essential to analyze this policy reaction as an integral part of the whole macroeconomic policy, in particular with respect to the type of exchange rate regime, as well as the financial borrowing constraints.

In respect to the monetary policy framework, in October 1995 the central bank started to implement a monetary strategy of a de facto fixed exchange rate regime. This strategy in principle means subordinating monetary policy to the exchange rate stability and, in order to be successful, requires support from fiscal policy. This is especially important for small and open economies, such as the Macedonian economy, where government spending could have a significant effect on the balance of payments. In this light, the control of government expenditures is one of the most important instruments for maintaining exchange rate stability. Thus, in the beginning of the implementation of this strategy (up to 1999), when the level of reserves stayed below 3 months of imports coverage, the main burden was on fiscal policy. However, with the accumulation of foreign reserves, there was more room for fiscal policy in the stabilization of output fluctuations.

An additional important factor for the fiscal policy stance were the relations of the RM with the International Monetary Fund (IMF). Fiscal discipline was reinforced by the arrangements concluded between the Government and the IMF, starting from 1994. For the major part of the analyzed period (11 out of 19 years) macroeconomic programs were mutually defined with and monitored by the IMF. Given the monetary strategy of a *de facto* fixed exchange rate and the standard set of IMF measures applied under such a regime, targets of low budget deficit were predominantly set. During the IMF program period, the average central government budget balance was -0.6 percent of GDP (compared to -2.5 percent of GDP for the whole analyzed period), and in 6 years the budget recorded little surplus.

The fiscal policy stance was also affected by the availability of financing sources and repayments of debt. This is particularly true for the first years of the transition period, when the level of accumulated internal and external arrears was especially important. The process of regulating relations with foreign creditors started in 1994 and paved the way for access to external financing, initially from the IMF, World Bank and other international financial institutions, and in later years, from private creditors on international capital markets. The development of

the domestic government securities market began in 2004 with the issuance of treasury bills (3-month and 6-month T-bills), but given the prudent fiscal policy of low budget deficits, the issued amount of government securities was rather small. Despite the opened alternative for additional financing through the development of the domestic securities market and better access to financing on the international financial market, fiscal policy remained rather prudent.

4 Presentation of the Model and Estimation Method Used

In order to investigate the cyclical behavior of fiscal policy in the RM, we use the general-to-specific approach. The most general (unrestricted) model used in this analysis for the cyclically unadjusted fiscal indicator has the following "standardized" form (Fatas and Mihov, 2001; IMF, 2005; Strawczynski and Zeira, 2007; Badinger, 2008; Bogdanov, 2010):

$$\text{Model 1: } G_t = \beta_0 + \beta_1 Ygap_t + X_t'\beta_i + \varepsilon_t , \quad (1)$$

where:

- *G* is the dependent variable for the fiscal policy and represents the cyclically unadjusted primary budget balance of the core government[5] as a ratio of GDP. The rationale for using the primary budget balance instead of the overall budget balance is discussed in Section 4. The explanation for using the primary budget balance as a ratio of GDP instead of some other measure such as budget expenditures as a ratio of GDP, as argued by Mackiewicz (2008: 6), is because the former is seen as the most comprehensive measure of the fiscal policy stance because it

5 Although the standard prescription in the literature for assessing the cyclical fiscal position is to use a more comprehensive definition of government, due to certain data limitations, we restrict our analysis to the core government definition. This research may be extended in the future by comparing the results presented in this analysis with the results based on a wider definition of government. As suggested by one of the anonymous referees, we provisionally compare the results discussed in Section 6.2 with the results based on the provisional data series available for the general government by running the same regressions. The estimated results are consistent with the ones reported in Section 6.2 but, due to the methodological inconsistency in the data series for the general government, we refrain from reporting those results. They are available from the authors upon request.

"… covers possibly all the government's operations." In contrast, the ratio of expenditures to GDP indicator is considered an incomplete measure of the fiscal policy stance because it "… does not give the full picture of the impact of fiscal policy on domestic demand. It is also a poor measure of fiscal discretion, since it ignores the revenue side of the budget …" (Mackiewicz, 2008: 6). Considering these arguments, we decided to use the ratio of primary budget balance to GDP as a dependent variable. Detailed methodological notes on how the fiscal policy indicators are calculated are presented in Appendix 3;

- β_0 is a constant;
- *Ygap* is the output gap;
- β_1 is the parameter that has to be estimated according to which we will be able to assess the cyclicality of the fiscal policy behavior in respect of output gap fluctuations;
- *X* is a matrix of other independent control variables such as: 1) dummy variable for the armed conflict in the country in 2001, 2) variable for the stock of public debt and 3) slope dummy variable controlling for the initial period of transition and the monetary policy regime prior to 1996;
- β_i is a vector of parameters that need to be estimated;
- *t* represents the time dimension of the data;
- ε_t is the error of the model.

The specification presented in Model 1 is based on the implicit assumption of unitary elasticity between the two variables (fiscal indicator and output gap). This could over- or under-estimate the fiscal policy reaction to output gap variations depending on the size of the public sectors, and thus may affect the size of the β_1 coefficient. Nonetheless, estimates about the direction of the government's reaction to business cycle fluctuations (whether it is positive or negative, i.e., the sign of the β_1 coefficient) are still consistent, which is the main area of interest of

this analysis (Mackiewicz, 2008). Moreover, as argued by Kiss and Reppa (2010) and Kiss and Vadas (2006), there is no uniform solution to this problem and unitary elasticity is often assumed in empirical work, especially "… if the tax and welfare system are relatively simple …" (Kiss and Reppa, 2010: 52), which is the case in the RM. The suggested alternative way of measuring the fiscal policy reaction to variations in output is to use the rate of change of GDP instead of the output gap (Mackiewicz, 2008). Nevertheless, this approach again does not solve the problem of the implicit assumption of unitary elasticity between the fiscal indicator and the variable measuring business cycle fluctuations because, as indicated by Mackiewicz (2008: 7), the estimates are "… still sensitive to the problem of different sized public sectors." Furthermore, this way of measuring business cycle fluctuations, instead of using output gap estimates, has an additional weakness because it "… can remove only the linear trend from the variables …" (Mackiewicz, 2008: 7), but it does not remove "… any other form of trend typically present in the GDP …" (Mackiewicz, 2008: 7). This could be done with the filtering method(s) that is(are) employed in this analysis (see Section 4). Consequently, due to these arguments, we decided to use the measures of the fiscal policy indicators and the economic cycle as in Model 1 because the alternative way has additional drawbacks and does not seem to solve the implicit assumption of unitary elasticity.

The parameter of greatest interest in Model 1 is the β_1 coefficient. According to its significance and estimated sign, we are able to determine the cyclical behavior of fiscal policy in respect of output gap fluctuations.

Table 1: *Interpretation of the β_1 Coefficient – Cyclical Behavior of the Cyclically Unadjusted Balance*

Primary Budget Balance		
β_1 coefficient is statistically significant with positive sign (+)	=>	the fiscal policy has countercyclical behavior
β_1 coefficient is statistically significant with negative sign (-)	=>	the fiscal policy has procyclical behavior
β_1 coefficient is statistically insignificant	=>	the fiscal policy has acyclical behavior

The same specification as presented in Model 1 is also used for determining the cyclical behavior of discretionary fiscal policy by using the cyclically adjusted primary budget balance (presented in Model 2). For the cyclical adjustment of the fiscal indicator we apply the "aggregated" approach that is preferred by the IMF, Organization for Economic Cooperation and Development (OECD) and the European Commission (Kiss and Vadas, 2006). More details are given in Appendix 3.

In Model 2, similar as before, the parameter of greatest interest is the α_1 coefficient, but now, unlike previously, not only are its statistical sign and significance important in determining the cyclical behavior of discretionary fiscal policy, but also its size (magnitude) compared to the β_1 coefficient estimated with Model 1.

$$\text{Model 2: } G_t = \alpha_0 + \alpha_1 Ygap_t + X_t'\alpha_i + \varepsilon_{tj} \quad (2)$$

Regarding the statistical significance and sign for the α_1 coefficient, the same analogy applies as for the β_1 coefficient, discussed previously. In the case of countercyclical discretionary fiscal policy behavior, the size of the β_1 coefficient as a measure of the overall fiscal policy reaction (the sum of discretionary fiscal policy measures plus automatic stabilizers, see Appendix 3) should be greater than the α_1 coefficient because both of them react in the same direction with the business cycle fluctuations. In the opposite case, when discretionary fiscal policy behavior is procyclical, the α_1 coefficient is expected to be statistically significant, with a negative sign. In this case its magnitude, in comparison to the β_1 coefficient from Equation 1, should be greater. This is justified with the argument that the impact of procyclical discretionary fiscal policy is partially offset by the impact of automatic stabilizers, which act countercyclically (Fedelino, Ivanova and Horton, 2009).

Table 2: *Interpretation of the α_1 Coefficient – Cyclical Behavior of the Cyclically Adjusted Balance (Discretionary Fiscal Policy)*

Cyclically Adjusted Primary Budget Balance				
α_1 coefficient is statistically significant with positive sign (+)	=>	the discretionary fiscal policy has countercyclical behavior	=>	$\alpha_1 < \beta_1$
α_1 coefficient is statistically significant with negative sign (-)	=>	the discretionary fiscal policy has procyclical behavior	=>	$\alpha_1 > \beta_1$
α_1 coefficient is statistically insignificant	=>	the discretionary fiscal policy has acyclical behavior	=>	/

The economic arguments for including the rest of the control variables in Models 1 and 2 are as follows:

- The reason for including the slope dummy variable that controls for the initial period of transition and different monetary policy regime applied prior to 1996 is to investigate whether the high-inflation environment prior to 1996, as well as the switch in monetary policy regime had any significant influence over the behavior of fiscal policy in stabilizing output fluctuations. With regard to monetary policy, during the period of 1991-1996, the National Bank of the Republic of Macedonia (NBRM) implemented a strategy of monetary targeting and needed support from fiscal policy in reducing hyperinflation. Hence, the fiscal position was tightened, although throughout this period the economy was in recession. Given the objective of eliminating hyperinflation, there was not much room for conducting countercyclical fiscal policy to mitigate the economic downturn. Hence, the statistical significance of this variable may indicate whether these features may have significantly affected fiscal policy.

- The intercept dummy variable included for the armed conflict in the country in 2001 aims to control for the changes that occurred in the fiscal policy behavior during 2001 due to increased fiscal expenditures (see Section 3). More precisely, in 2001 GDP growth was negative, which resulted in a negative output gap. This in turn caused a gradual reduction

in fiscal revenues and substantial increase in fiscal expenditures due to the armed conflict that ultimately resulted in a deepening budget deficit. Hence, by including this dummy variable we aim to control for these temporary changes in fiscal policy.

- The reason for including the variable for the stock of public debt as a ratio of GDP is to control for the budget financing constraints which fiscal authorities are faced with in designing fiscal policy. More explicitly, when the stock of public debt relative to GDP increases, fiscal authorities have limited possibilities for additional borrowing because the country's risk premium also increases. Consequently, fiscal policy authorities are forced to spend less due to restricted sources of financing. Additionally, with the rising public debt to GDP ratio, the value of annuities also grows, forcing fiscal authorities to spend less and to start reducing the size of the budget deficit. In other words, an increase in the stock of public debt to GDP ratio should drive the fiscal policy behavior towards greater prudence and reduced spending (Fatas and Mihov, 2001; Alesina and Tabellini, 2005; IMF, 2005). This variable in Equations 1 and 2 is included with a one period time lag because the stock of public debt in the previous period affects the current decisions of fiscal policy authorities. Hence, the expected sign of this variable is positive because an increase in the public debt to GDP ratio leads to higher pressures for budget savings (lower deficits or greater surpluses).

In Models 1 and 2 there is a possibility of two-way causation between the dependent variable (the fiscal indicator variable) and some of the independent variables, i.e., the output gap and the stock of public debt. This two-way causation between the dependent variable and part of the independent variable(s) may cause an endogeneity problem, defined as a non-zero correlation between any of the regressors and the disturbances, expressed as follows (Wooldridge, 2002):

$$E = (u_t \mid x_t) \neq 0. \qquad (3)$$

Consequently, the endogeneity problem may lead to inconsistent and biased OLS estimators.

The two-way causation between the output gap and fiscal policy is evident: not only may output gap variations affect the decisions made by fiscal authorities in designing fiscal policy, but fiscal policy may also affect aggregate demand and, thus, the output gap (Fatas and Mihov, 2001; Strawczynski and Zeira, 2007; Badinger, 2008; Bogdanov, 2010). For instance, a positive output gap may affect the decision making process of fiscal authorities in designing fiscal policy in the direction of achieving greater savings, i.e., increasing the size of the positive budget surplus or reducing the size of the negative budget deficit. One of the reasons for accumulating higher savings when the output gap is positive might be because fiscal authorities can spend the accumulated savings later on if the output gap becomes negative and vice versa. Nonetheless, fiscal policy behavior may also affect aggregate demand, and hence output gap fluctuations, through public expenditures and/or public revenues.

The two-way causation between fiscal policy and the stock of public debt may become relevant due to some of the already explained reasons. More precisely, high public indebtedness may affect fiscal policy behavior through a limited access to additional borrowing and may thus constrain public spending. On the other hand, fiscal policy behavior may also affect the size of public debt. For example, a restrictive fiscal policy may lead to greater savings that can be used for earlier repayment of part of the public debt, which, *ceteris paribus*, would reduce the size of public indebtedness, as was the case with the fiscal policy in the RM in the period of 2006 and 2007.

According to the structure of Models 1 and 2 used in this analysis, in selecting the estimation method we take into account the specific characteristics of the data series, i.e., their stationarity,[6] the presence of heteroskedasticity (see later in

6 The stationarity of the variables is examined by using unit root tests such as the Augmented Dickey-Fuller (ADF) test, several lag length information criteria (Akaike, Schwartz, modified Akaike, modified Schwartz and Hannan-Quin) as well as the Phillips-Perron (PP) test. The results of the tests employed indicate that all the variables are stationary, i.e., I(0). These test results are available from the authors upon request.

the paragraph) and, as explained previously, the possibility of two-way causation between the dependent and part of the independent variables (the endogeneity problem). Consequently, as the most appropriate estimator we select the generalized method of moments (GMM). The major reason for employing the GMM estimator, unlike the majority of studies assessed in Section 2, is that it is designed to control for the endogeneity problem by using instrumental variables. Moreover, this estimator is more efficient compared to the other estimators that also use instrumental variables (IVs), such as two-stage least squares (2SLS), when there is heteroskedasticity of unknown form (Baum, Schaffer and Stillman, 2003; Cameron and Trivedi, 2005). By using several lags as internal instruments of the possibly endogenous variables, the GMM estimator may use more moment conditions than there are parameters to be estimated, thus maximizing the information available for the estimation process. That way, the GMM estimator becomes more efficient (compared to 2SLS) in the case of heteroskedasticity and more consistent (compared to OLS). Baum, Schaffer and Stillman (2003: 11) point out that even when "… heteroskedasticity is not present, the GMM estimator is no worse asymptotically than the IV estimator", referring to the 2SLS estimator. An additional advantage of employing the GMM over the 2SLS estimator is that the GMM estimator "… does not require distributional assumptions like normality …" (Verbeek, 2004: 152). Moreover, by applying the Hansen test, we check the joint validity of the used instrument sets. However, a possible weakness of the GMM method is that it may require a relatively large sample size, although there is no benchmark in the literature of how large the sample should be. Having in mind the relatively small number of observations in our analysis that cover a period of 19 years (see Section 5) and the possibility that the estimates may be sensitive to the choice of weighting matrix, we use the iterative GMM which iteratively (re)estimates the weighting matrices and the parameters of the model until convergence. Consequently, it is argued that the iterative GMM provides better small sample properties (Verbeek, 2004; Hall, 2005).

In order to support our choice of using the GMM over 2SLS, we perform the "standard" Breusch-Pagan/Godfrey/Cook-Weisberg test for detecting heteroskedasticity as well as the Pagan-Hall statistic (Pagan and Hall, 1983) by using the "ivhettest" command in Stata 10, since, as suggested by Baum, Schaffer and Stillman (2003), the latter is robust to the presence of heteroskedasticity and non-normal distribution of residuals. Both test results for the annual data set for all regressions presented in Table 3 (Section 6.2) indicate non-rejection of the null hypothesis of homoskedasticity at a 10 percent level of significance, whereas for the quarterly data set the null hypothesis of homoskedasticity cannot be rejected at a 5 percent level of significance,[7] indicating a possible presence of heteroskedasticity in the model. An additional non-formal check of whether there is heteroskedasticity in the model when applying the iterative GMM, as argued by Baum, Schaffer and Stillman (2003: 8), is that in the case when the distribution of residuals is homoskedastic, "… the iterations converge after one step." In the regressions reported in Tables 3, 4 and 5, where all of them are estimated with the iterative GMM, convergence is achieved after more than 1 iteration, pointing again to a possible presence of heteroskedasticity. Hence, both methods employed indicate a possible presence of heteroskedasticity, based on which we argue for the use of the GMM estimator in our analysis.

5 Data Description

In assessing the cyclicality of the fiscal policy behavior in the RM we use an annual data set. Quarterly data are available, but the period is much shorter compared to the annual data set and we use them for a robustness check. The time span of the annual data set is from 1991 to 2009, whereas the time span of the quarterly data set is from 1997 to 2009. Therefore, the major reason for using the annual data set is the longer time span, which includes the initial transition period, when a different monetary strategy was applied. Hence, by using annual data we are able

7 These test results are available from the authors upon request.

to investigate whether the initial period of transition and the different monetary policy regime substantially affected the fiscal policy behavior.

All of the variables used in the analysis, apart from the stock of public debt to GDP ratio, are in real terms. The following paragraphs provide a detailed description of the variables and their computation.

The core government balance (without extra budgetary funds) is used as an indicator of fiscal policy. In constructing the core government balance, according to the empirical literature (Fatas and Mihov, 2001; Lane, 2003; IMF, 2005; Ilzetzki and Vegh, 2008; Mackiewicz, 2008; Abdih et al., 2010), we subtract interest payments from total expenditures and, hence, throughout the whole analysis we work with the primary central government budget balance. The rationale for subtracting interest payments from fiscal expenditures, according to Mackiewicz (2008), is because interest payments represent an exogenous category. Namely, they are a fiscal expenditure that occurs because of fiscal policy behavior in the past. Ultimately, in designing the current fiscal policy and the size of expenditures, fiscal authorities cannot influence the size of interest payments and they take them as an exogenous factor determined by fiscal policy decisions in the past related to public borrowing.

For consistency, the data related to fiscal categories, i.e., fiscal revenues and expenditures, are adjusted throughout the whole sample period according to the Governmental Financial Statistics (GFS) 2001 methodology set by the IMF.[8]

In order to assess the cyclical behavior of discretionary fiscal policy, we cyclically adjust budget revenues and expenditures by using certain assumptions about the size of the elasticity of budget revenues and expenditures in respect of the variations of the output gap. For more details about the elasticity used and how the calculations are done, see Appendix 3.

The output gap is calculated as a percentage difference between the real and potential GDP. In estimating the potential GDP and output gap we use two

8 More detailed information about the methodological changes made is available from the authors upon request.

common approaches: 1) a statistical approach, by employing the Hodrick-Prescott (HP) filter method and 2) a model-based approach. In our analysis, in estimating the output gap by using the HP filter method for the annual data set, we use two data series for the real GDP, i.e., the first one starts from 1990 and the second one from 1961. By doing this, we examine whether the results are sensitive to the series used in estimating the output gap (a robustness check).

Additionally, in estimating the output gap, as an extra robustness check we use a model-based estimation of the output gap. More precisely, the structural model-based estimation of the output gap is based on the MAKPAM model that is used for macroeconomic projections by the NBRM (for details about this model see Bojceva-Terzijan et al., 2011).

The variable used for the level of public stock to GDP ratio is constructed by dividing the nominal value of the total public debt (internal and external) of the general government with the nominal GDP. A detailed description about the construction of the data series and their sources is provided in Appendix 4.

6 An Empirical Assessment of the Fiscal Policy Behavior in Respect of Economic Fluctuations

This section aims to empirically examine the cyclical behavior of the fiscal policy in respect of output gap fluctuations in the RM by using both the overall (cyclically unadjusted) primary budget balance and the cyclically adjusted primary budget balance. In that respect, we first assess the fiscal policy behavior with a simple analysis of time series data, followed by an interpretation of the econometric results from Models 1 and 2.

6.1 Data Analysis

A straightforward and clear conclusion about the fiscal policy behavior in the RM for the whole period is difficult to be drawn, due to the turbulent economic and political environment, notably in the initial period of transition. Yet, as a first step, we attempt to make an inference on the fiscal policy stance through a visual inspection of the data. We focus on the cyclically adjusted primary balance, as an indicator of discretionary fiscal policy. Nonetheless, it is worth noting that due to the relatively small size of the automatic stabilizers as a ratio of GDP, the dynamics of the overall primary budget balance and cyclically adjusted primary balance are similar (see Appendix 2). Hence, the inference from the analysis holds for both of the fiscal stance measures.

In the first years of the transition period, there is an indication of a procyclical fiscal policy (see Appendix 2), since the relationship between the cyclically adjusted primary budget balance and the output gap seems to be negative. However, it is an important fact that in the first year of monetary independence (1992) discretionary fiscal policy was countercyclical. Namely, along with a large contraction of the positive output gap, fiscal authorities increased discretionary spending, which ultimately resulted in a widening of the budget deficit. The countercyclical fiscal behavior in 1992 can be confirmed by the positive fiscal stimulus as well. However, the sustainability of this type of countercyclical fiscal policy was not feasible in the long run, because the economy was already experiencing hyperinflation, fuelled by fiscal pressures. Consequently, in the following years the policy commitments towards reducing inflation narrowed the space for maneuver of fiscal authorities in acting countercyclically, i.e., reducing the negative output gap (see Appendix 2). Moreover, by signing an IMF loan agreement in 1994, the fiscal consolidation process was reinforced, and although the economy was operating under its potential, in 1994 the budget surplus as a ratio of GDP was the highest over the whole period of analysis. Accordingly, we can conclude that the main aim of fiscal policy in the initial period of transition was mainly to support the disinflationary process, and not

devoted towards smoothing output fluctuations. The need for prudence in the initial anti-inflationary phase was augmented by the government's constrained access to additional financing and from the end of 1995 by the introduction of a *de facto* fixed exchange rate regime. During the second period (after introducing the fixed exchange rate regime), in general, we can observe a positive relationship between the discretionary fiscal policy and the economic cycle, indicating a countercyclical behavior.

Overall, from a simple data analysis of the discretionary part of the fiscal policy and the output gap variations we cannot draw a clear conclusion about the general trend in the fiscal policy stance. However, there are some indications that in the beginning of the transition process until 1996, the discretionary fiscal policy acted in a procyclical manner, and afterwards, in general, it was countercyclical. These inferences about the fiscal policy based on simple data analysis are only indicative and we explore them further by using an econometric examination.

6.2 Interpretation of the Econometric Results

As mentioned in Section 5, the econometric research is based on an annual data set, whereas the robustness check is done by using a quarterly data set (see Section 5 and Appendix 4). In estimating the results with both frequencies of the data sets we use Newey-West heteroskedasticity and autocorrelation consistent (HAC) standard errors. Moreover, the sensitivity of the results is additionally checked by using different lags of the instruments selected for the endogenous variable(s). The results indicate that the estimated coefficients are robust to the different lags of instruments selected. Additionally, the sensitivity of the results is checked by using different kernel weight matrices. More precisely, in estimating the regressions reported in Tables 3, 4 and 5 we use the Bartlett (Newey-West bandwidth selection) kernel, whereas the robustness of the results is checked by using the quadratic spectral (Andrews bandwidth selection) kernel. In interpreting the estimated results from Models 1 and 2, we first pay attention to the Hansen

test for joint validity of the instruments used for the endogenous variables. The test results from all model specifications indicate that the null hypothesis for joint validity of the instruments cannot be rejected at the 10 percent level of significance, implying that the chosen instrument sets are valid.

Moreover, in order to examine the possibility of having spurious regression(s), we also check the stationarity of the residuals by conducting a unit root test. The unit root test results[9] indicate that the residuals from all regressions presented in Tables 3, 4 and 5 are stationary as expected, because all the variables in the models are stationary (see Section 4). Additionally, in order to check whether the models are correctly specified, i.e., whether there is an omitted dynamics, we check the autocorrelation of the residuals by constructing a correlogram of the residuals in levels and by running an autoregressive process, i.e., AR(1). The correlogram output indicates that residuals from the regressions in Tables 3, 4 and 5 are white noise and the Ljung-Box Q-statistic rejects the null hypothesis of significant AR and MA terms in the residuals. The regressions run for the AR(1) process in the residuals indicate that the AR(1) term is statistically insignificant.[10]

The next step is the interpretation of the estimated results, according to which the major emphasis is on statistical significance, sign and size of the coefficients. The latter is of importance mainly as an indicator of discretionary fiscal policy behavior. The estimated results are presented in Table 3.

The results from the most general model, i.e., Model 1 (regressions 1 and 2, Table 3) and Model 2 (regressions 5 and 6, Table 3) indicate that almost all variables are statistically significant at a 1 percent level of significance. The coefficient in front of the output gap is statistically significant and has a positive sign for both models, i.e., with cyclically unadjusted and cyclically adjusted fiscal indicators.

9 We run the augmented Dickey-Fuller test (ADF) by using several lag length information criteria (Akaike, Schwartz, modified Akaike, modified Schwartz and Hannan-Quin) as well as the Phillips-Perron (PP) test. The results of the tests employed indicate that the residuals are stationary, i.e., I(0). These test results are available from the authors upon request.

10 The correlogram output and Ljung-Box Q-statistic and AR(1) regressions from the residuals are available from the authors upon request.

Table 3: *Estimates from the Cyclically Unadjusted and Cyclically Adjusted Primary Budget Balance (Annual Data 1991-2009)*

	Dependent Variable - Cyclically Unadjusted Primary Budget Balance				***Dependent Variable - Cyclically Adjusted Primary Budget Balance***			
Independent Variables	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**	**Regression 6**	**Regression 7**	**Regression 8**
Constant	1.57***	1.55***	-5.49***	-5.51***	1.57***	1.55***	-5.57***	-5.58***
Output gap - HP filter method 1990-2009	0.30***		0.58***		0,08		0.36***	
Output gap - HP filter method 1961-2009		0.31***		0.61***		0.10***		0.39***
Interactive slope dummy prior to 1996	-0.91***	-0.70***			-0.91***	-0.70***		
Joint effect (output gap + interactive dummy)	-0.61***	-0.39***			-0,83	-0.60***		
Dummy for the armed conflict in 2001	-1.55***	-1.51***			-1.46***	-1.42***		
Stock of public debt to GDP ratio			0.12***	0.12***			0.12***	0.12***
Used lagged values as instruments for the endogenous variables	from -1 to -3	from -1 to -3	from -1 to -2	from -1 to -2	from -1 to -3	from -1 to -3	from -1 to -2	from -1 to -2
Hansen test for the joint validity of the instruments (p-value)	0.37	0.36	0.67	0.67	0.37	0.36	0.67	0.67

Note: *, ** and *** denote significance at the 10, 5 and 1 percent significance level, respectively.
Source: Authors' calculations.

Regarding the estimated coefficients in front of the interactive dummy variable that controls for the initial period of transition and the different monetary policy regime applied prior to 1996, the results from both models (for the cyclically unadjusted and cyclically adjusted primary budget balance) are statistically significant and have a negative sign. This indicates a different fiscal policy behavior before and after 1996. Namely, the sum of coefficients in front of the dummy variable prior to 1996 and output gap is negative (the coefficients are individually and jointly statistically significant), pointing to a procyclical fiscal policy before 1996. Moreover, the sum of both coefficients estimated with cyclically adjusted data is greater than the sum given by cyclically unadjusted data, which supports the assumption of a procyclical discretionary fiscal policy prior to 1996 (see Section 4, Table 2).

However, after 1996, the results in both models indicate a shift in fiscal policy from pro- to countercyclicality. The magnitude of the coefficients in front of the output gap variable from the equations for cyclically adjusted data (regressions 5 to 8, Table 3) is lower in comparison to the coefficient estimated from the equation for the cyclically unadjusted budget balance (regressions 1 to 4, Table 3). The greater magnitude of the estimated coefficient in front of the output gap variable in the equation with cyclically unadjusted data (as an indicator of the overall fiscal policy reaction) suggests that the impact of the countercyclical discretionary fiscal policy measures is enhanced by the automatic stabilizers, which by definition act countercyclically (see Section 4, Table 2).

The dummy variable that controls for the armed conflict in the country in 2001 is also statistically significant in all regressions in Table 3 and has a negative sign as expected (see Section 4), indicating that the armed conflict had a negative influence on both the overall fiscal policy and the discretionary part of the fiscal policy.

Moreover, by controlling for an additional variable in the models, i.e., the variable for the stock of public debt as an indicator of budget financing constraints (as

explained in Section 4), the results are consistent with the previous ones (see regressions 3, 4, 7 and 8, Table 3).[11] For example, the estimated coefficients in front of the output gap variable remain statistically significant and positive for both the cyclically unadjusted and cyclically adjusted primary budget balance models. The estimated coefficients in front of the public debt variable (with one lag) are statistically significant and positive in line with the prior expectations. This implies that fiscal authorities take into account the stock of public debt in the previous period whilst designing the fiscal policy in the current period. Thus, the results indicate that an increase in public debt in the previous period is associated with reduced spending and increased savings by fiscal policy authorities. These results regarding the public debt variable are consistent with the results of Kadievska-Vojnovik (2007) based on a VAR model for the period 1999-2006. According to Kadievska-Vojnovik (2007), the results from an impulse response analysis indicate that the primary budget balance reacts positively to a negative shock in public debt (an increase in public debt) in the current period and in one period ahead. Nonetheless, the results related to the public debt variable should be taken with caution due to the short time span of the data. More precisely, the stock of public debt data starts only from 1999. Accordingly, the instruments used in the models controlling for the endogeneity of some of the independent variables additionally reduce the observations and, hence, we work with low degrees of freedom.

The robustness of the results discussed in the previous paragraphs is checked by splitting the annual data sample from 1996 (see Table 4). An additional robustness check is done by using a quarterly data set starting from 1997 to 2009 and by using model-based estimations of the output gap instead of estimations based on the HP filter method (see Table 5).

11 The results of the regressions that include the stock of public debt variable are run separately because the data series of the stock of public debt variable start from 2000.

Table 4: *Estimates from the Cyclically Unadjusted and Cyclically Adjusted Primary Budget Balance Reached by Splitting the Annual Data Sample from 1996 (Annual Data 1996-2009)*

	Dependent Variable - Cyclically Unadjusted Primary Budget Balance			
Independent Variables	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**
Constant	1.59***	1.42***	1.58***	1.41***
Output gap - HP filter method 1990-2009	0.26***		0.05	
Output gap - HP filter method 1961-2009		0.24*		0.03*
Dummy for the armed conflict in 2001	-4.68***	-3.42***	4.60***	3.33***
Stock of public debt to GDP ratio				
Used lagged values as instruments for the endogenous variables	from -1 to -3	from -2 to -4	from -1 to -3	from -2 to -4
Hansen test for the joint validity of the instruments (p-value)	0.56	0.87	0.56	0.88

Note: *, ** and *** denote significance at the 10, 5 and 1 percent significance level, respectively.
Source: Authors' calculations.

Table 5: *Estimates from the Cyclically Unadjusted and Cyclically Adjusted Primary Budget Balance (Quarterly Data 1997:Q1 – 2009:Q4)*

	Dependent Variable - Cyclically Unadjusted Primary Budget Balance				***Dependent Variable - Cyclically Adjusted Primary Budget Balance***			
Independent Variables	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**	**Regression 5**	**Regression 6**	**Regression 7**	**Regression 8**
Constant	1.94***	1.43***	-22.73***	-13.89***	1.97***	1.44***	-22.84***	-13.53***
Output gap - model-based	0.70***		0.73***		0.49***		0.52***	
Output gap - HP filter method 1997-2009		0.79***		0.89***		0.59***		0.70***
Dummy for the armed conflict in 2001	-2.84***	-3.56***			-2.63***	-3.38***		
Stock of public debt to GDP ratio			0.70***	0.43***			0.71***	0.42***
Used lagged values as instruments for the endogenous variables	from -1 to -3	from -1 to -3	from -2 to -4	from -2 to -4	from -1 to -3	from -1 to -3	from -2 to -4	from -2 to -4
Hansen test for the joint validity of the instruments (p-value)	0.37	0.35	0.32	0.34	0.35	0.34	0.32	0.34

Note: *, ** and *** denote significance at the 10, 5 and 1 percent significance level, respectively.
Source: Authors' calculations.

As can be seen in Table 4, the results from the annual data set reached by splitting the sample from 1996, are in line with the previously discussed results.[12] The estimates indicate a countercyclical fiscal policy behavior for both the cyclically unadjusted and cyclically adjusted primary budget balance during the period 1996-2009, although the coefficient of the output gap variable in regression 4, Table 4 is somewhat lower compared to the same coefficient from regression 6, Table 3.

The results from the quarterly data set that include the model-based estimation of the output gap (Table 5) are also consistent with the previously discussed results, pointing again to a countercyclical fiscal policy behavior for both the overall and the discretionary fiscal policy behavior. Moreover, the results in respect of the dummy variable for the armed conflict and the public debt variable are also consistent with the ones already discussed. The major noteworthy difference is that the size of the coefficients, in general, is somewhat higher compared to the coefficients from the annual data set.

Overall, the estimated results indicate that controlling for the initial period of transition and the different monetary policy regime applied prior to 1996 does matter. The fiscal policy in respect of both the cyclically unadjusted and cyclically adjusted primary budget balance prior to 1996 was procyclical. Regarding the magnitudes of coefficients in the two models (the one for the cyclically unadjusted and the one for the cyclically adjusted primary budget balance), it can be concluded that the main drivers of the procyclical behavior of the fiscal policy prior to 1996 were the procyclical discretionary fiscal policy measures. However, after 1995, the results indicate a shift in fiscal policy towards countercyclicality, which suggests that fiscal policy authorities have indeed taken into account the business cycle in the economy and have acted towards reducing output fluctuations. Moreover, the results also suggest that the armed conflict in the country as well as the stock of public debt were significant factors in shaping the fiscal policy behavior. However,

12 The results related to the stock of public debt variable are the same as regressions 3, 4, 7 and 8 reported in Table 3 because the sample in these regressions starts from 2000 due to the shorter time span of the stock of public debt variable (see Appendix 4).

the results of the models that include the stock of public debt variable should be interpreted cautiously due to the short time span of the data.

7 Conclusions

The main research aim of this analysis was to investigate the cyclical behavior of fiscal policy in respect of output gap fluctuations in the Republic of Macedonia over the period 1991-2009. For this reason, we have used two fiscal policy indicators: the cyclically unadjusted primary budget balance and the cyclically adjusted primary budget balance, the latter being an indicator of the discretionary fiscal policy stance. We also aimed to investigate whether the fiscal policy behavior had been different prior to 1996, due to the initial period of transition and the different monetary policy regime applied. Moreover, in this analysis we have additionally controlled for other factors that seem to have had a significant impact over the fiscal policy behavior such as the armed conflict in 2001 and budget financing constraints. Regarding the estimation method, this research controls for the two-way causation between the output gap and the fiscal policy indicators by applying the iterative GMM estimator.

The estimated results indicate that there has been a change in the fiscal policy behavior after 1995. Namely, the results imply that during the initial period of transition, when the focus was on combating inflation and a different monetary strategy was applied, the fiscal policy behavior was procyclical. This may suggest that fiscal policy authorities did not take the appropriate discretionary fiscal measures to reduce economic fluctuations. This finding is consistent with various studies conducted for developing economies according to which the relatively low level of economic development and the unstable macroeconomic environment contribute to the procyclicality of the fiscal policy.

However, the estimates after 1995 point to a change in the fiscal policy behavior towards countercyclicality. This may suggest that the macroeconomic and political stabilization of the country as well as the different monetary policy regime applied

after 1995 have significantly affected the behavior of fiscal policy authorities. Other significant factors that seem to have influenced fiscal policy behavior are the impact of the armed conflict in 2001, that led to an increased budget deficit for that year, as well as the stock of public debt as an indicator of budget financing constraints. The latter may suggest that the stock of public debt poses a significant financing constraint over the fiscal policy behavior. However, these results in respect of the public debt should be taken with caution due to the short time span of the data. The estimated results are robust to various measures of the output gap variable as well as different frequency of the data.

Overall, this analysis contributes to the existing empirical literature for the transition economies of Southeastern Europe by providing empirical evidence that the turbulent initial period of transition and the different monetary strategy applied prior to 1996 were important factors affecting the role of fiscal policy in stabilizing the economic cycle. However, after the change in the monetary policy regime at the end of 1995 and the economic and political stabilization of the country, fiscal policy authorities have taken appropriate discretionary measures for reducing output fluctuations.

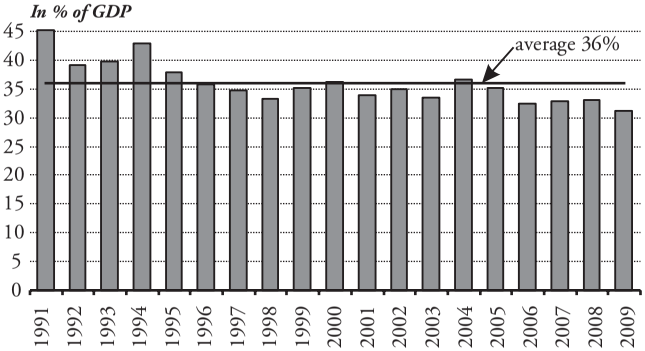
This analysis may be extended further by comparing the sensitivity of the results in respect of the cyclically adjusted budget balance by using a "disaggregated approach". Further on, the estimated results of this research may be compared by replicating the same regressions with other IV estimators such as 2SLS in order to examine which estimator provides better small sample properties.

An open issue for future research may be investigating the interactions between monetary and fiscal policy and their joint impact in stabilizing output fluctuations. This may provide an important policy implication for macroeconomic policy-makers in assessing which policy (fiscal or monetary) has a more active role in reducing output fluctuations. Moreover, exploring the interaction between fiscal and monetary policy can provide additional information on whether shocks in monetary and/or fiscal policy have a temporary or permanent impact on the economic activity of the country.

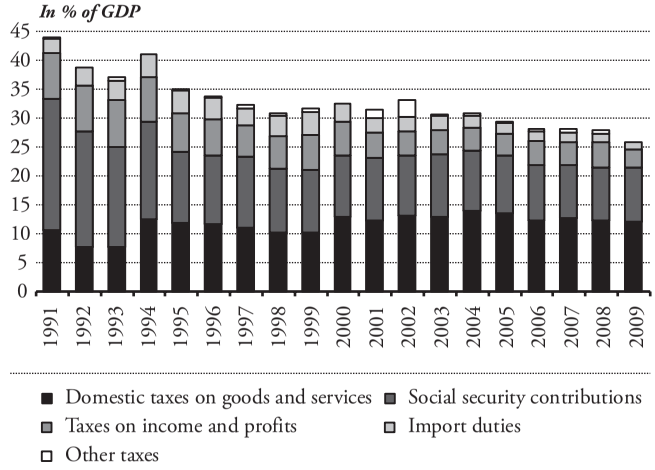
Appendix 1

Central Government Indicators

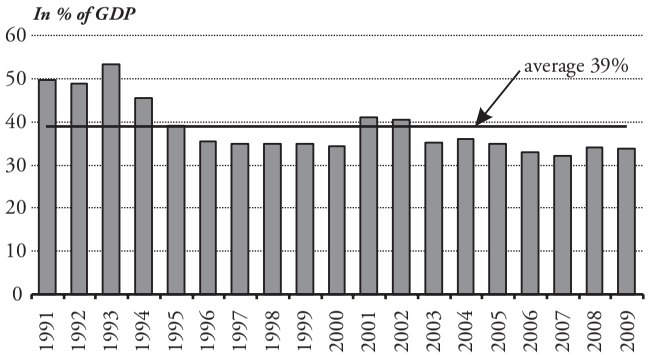
Central Government Revenues



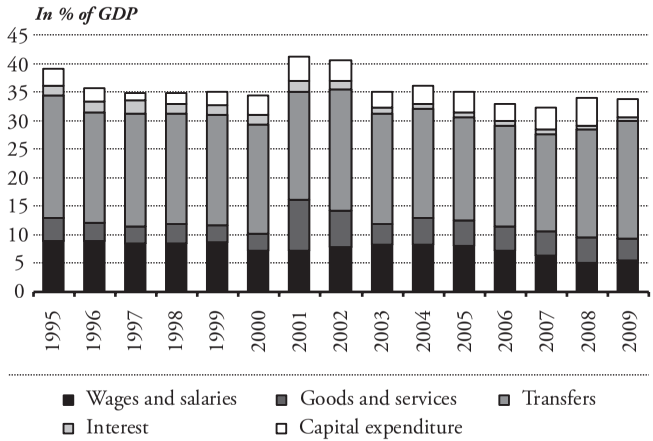
Structure of Tax Revenues



Central Government Expenditures (% GDP)



Structure of Current Budget Expenditures* (% GDP)



Note: * The data for wages, goods and services and interest are not available before 1995.
Source: See Footnote 2 on page 63.

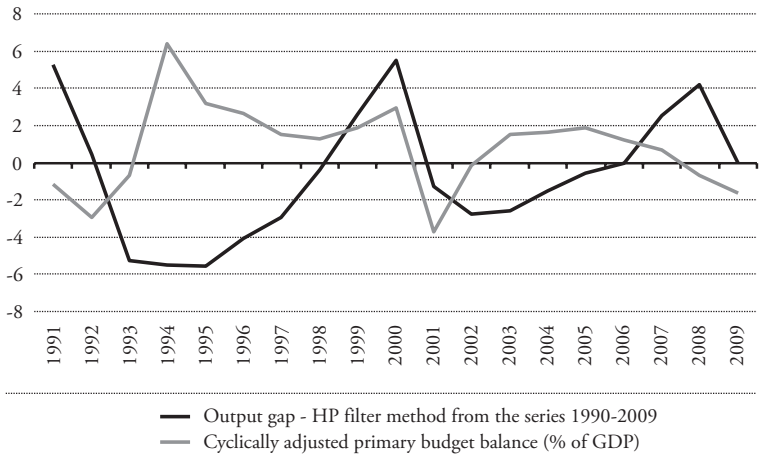
Appendix 2

Fiscal Indicators

	Cyclically unadjusted primary budget balance (% of GDP, in real terms)	Cyclically adjusted primary budget balance (% of potential GDP, in real terms)	Output gap - HP filter method from the series 1990-2009 (in %)	Fiscal impulse (in percentage points)	Change in the output gap - HP filter method from the series 1990-2009 (in percentage points)	Automatic stabilizers (% of GDP)	IMF arrangements	"Good times" (positive output gap)	"Bad times" (negative output gap)
1991	0.0	-1.2	5.2						
1992	-2.8	-3.0	0.5	1.7	-4.8	-1.1			1.0
1993	-2.0	-0.6	-5.2	-2.3	-5.7	-1.3			1.0
1994	5.2	6.0	-5.5	-6.7	-0.2	0.2	1.0		1.0
1995	2.0	3.0	-5.6	3.0	-0.1	-0.1	1.0		1.0
1996	1.7	2.6	-4.1	0.5	1.5	0.3	1.0		1.0
1997	1.0	1.5	-2.9	1.1	1.2	0.3	1.0		1.0
1998	1.2	1.2	-0.4	0.2	2.5	0.5	1.0		1.0
1999	2.4	1.9	2.6	-0.7	3.0	0.6	1.0	1.0	
2000	4.1	3.1	5.5	-1.2	2.9	0.7		1.0	
2001	-4.1	-3.7	-1.3	6.8	-6.8	-1.6			1.0
2002	-0.9	-0.2	-2.7	-3.5	-1.5	-0.3			1.0
2003	0.9	1.5	-2.6	-1.6	0.1	0.1	1.0		1.0
2004	1.3	1.6	-1.5	-0.1	1.1	0.2	1.0		1.0
2005	1.7	1.8	-0.6	-0.2	0.9	0.2	1.0		1.0
2006	1.2	1.2	0.0	0.7	0.5	0.1	1.0	1.0	
2007	1.2	0.7	2.5	0.5	2.6	0.6	1.0	1.0	
2008	0.3	-0.7	4.2	1.4	1.6	0.4		1.0	
2009	-1.6	-1.6	0.0	1.0	-4.2	-1.0			1.0

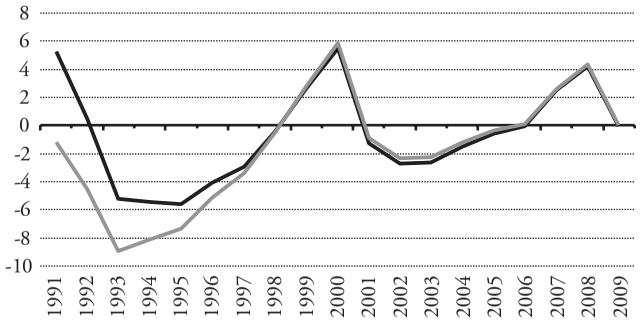
Source: Authors' calculations.

Cyclically Adjusted Primary Budget Balance and the Output Gap (1991-2009)

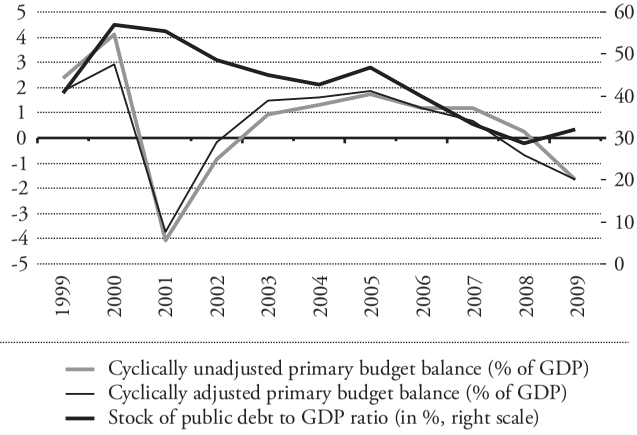


Source: Authors' calculations.

Output Gap (HP Filter Method, 1990-2009)

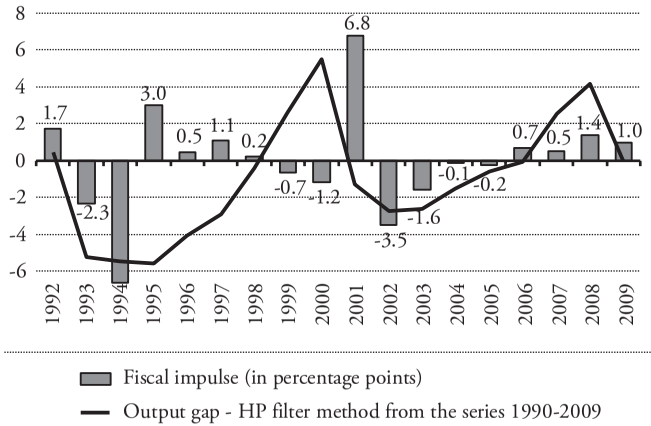


Public Debt and the Budget Balance (1999-2009)

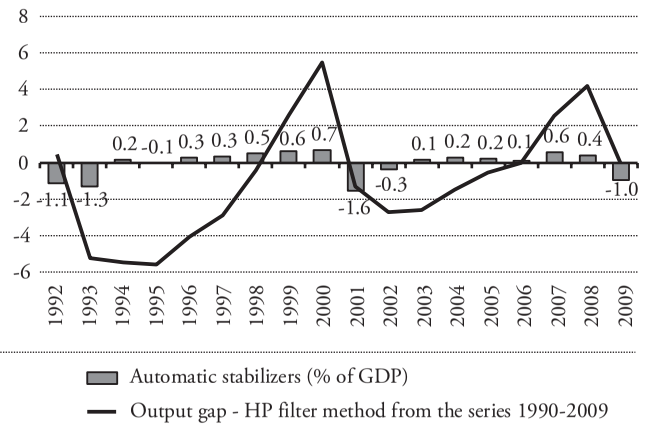


Source: Authors' calculations.

Fiscal Impulse and the Output Gap (1990-2009)



Automatic Stabilizers and the Output Gap (1990-2009)



Sources: Authors' calculations; Ministry of Finance of the Republic of Macedonia.

Appendix 3

Methodological Notes Explaining the Calculations of the Fiscal Policy Indicators[13]

In order to examine the cyclical behavior of fiscal policy, i.e., whether it is pro- or countercyclical and what determines fiscal behavior, a distinction between discretionary fiscal policy measures and automatic stabilizers is important. Accordingly, the overall cyclically unadjusted primary budget balance (PB) can be separated into two parts: a) cyclically adjusted primary budget balance (CAPB) and b) cyclical part of the primary budget balance that automatically reacts to the economic cycle (CPB):

$$PB = CAPB + CPB\ . \tag{4}$$

The cyclically adjusted primary budget balance (CAPB), also known as "structural" balance, indicates discretionary fiscal policy measures because it is not directly affected by the economic cycle. The cyclical part of the primary budget balance (CPB) is an indicator of automatic fiscal stabilizers because it is directly influenced by cyclical fluctuations in the economy. More precisely, automatic stabilizers refer to fiscal categories that automatically react to the economic cycle without any intervention by fiscal policy authorities. For example, they may refer to the automatic reduction in tax revenues and increase in social transfers and unemployment benefits when the economy is in recession and vice versa.

In estimating the cyclically adjusted primary budget balance, we take the aggregated approach (see Section 4). Hence, the estimation of the cyclically adjusted primary budget balance as a ratio of the potential GDP (capb) uses the potential GDP as a "… 'natural' scaling variable, since cyclically adjusted balances measure what the fiscal balance would have been if the output had been at its potential level …" (Fedelino, Ivanova and Horton, 2009: 4), as presented in Equation 5:

13 The formulas and explanations used in this Appendix are mainly based on Fedelino, Ivanova and Horton (2009).

$$capb = \frac{CAPB}{Y^p} = \frac{R^{ca}}{Y^p} - \frac{G^{ca}}{Y^p} = \frac{R}{Y}\left(\frac{Y^p}{Y}\right)^{e_r - 1} - \frac{G}{Y}\left(\frac{Y^p}{Y}\right)^{e_g - 1}$$

$$= r(1+gap)^{-(e_r - 1)} - g(1+gap)^{-(e_g - 1)}$$

$$= r(1-(e_r - 1)\,gap) - g(1-(e_g - 1)\,gap), \qquad (5)$$

where:

- R^{ca} and G^{ca} are cyclically adjusted revenues and expenditures;
- R and G are cyclically unadjusted revenues and expenditures;
- ε_r and ε_g are the elasticity of revenues and expenditures in respect of output gap fluctuations. According to the commonly used approach, the elasticity is taken to be as follows: $\varepsilon_r = 1$ and $\varepsilon_g = 0$;
- Y is actual GDP;
- Y^p is potential GDP;
- r and g indicate the ratios of revenues and expenditures in respect of the actual GDP, respectively.

By using the elasticity of revenues and expenditures in respect of output gap fluctuations of 1 and 0, respectively, it is assumed that the differences in the cyclically unadjusted and cyclically adjusted budget balances arise mainly from the expenditure side of the budget. More precisely, with the elasticity of fiscal revenues of 1, it is assumed that revenues do not comprise significant discretionary fiscal policy measures and that automatic stabilizers mainly drive the change in revenues. By using the elasticity of 0 for fiscal expenditures, it is assumed that the greatest reaction of fiscal expenditures comes from discretionary fiscal policy measures and not from automatic stabilizers. This is explained with the argument that the major automatic stabilizer on the expenditure side are unemployment benefits, which usually have a small share in the overall budget expenditures (Fedelino, Ivanova and Horton, 2009).

The cyclical behavior of discretionary fiscal policy, known as the fiscal policy stance, can be determined by assessing the relationship between the cyclically adjusted primary budget balance and the output gap. For instance, the fiscal policy stance is countercyclical when the relationship between the cyclically adjusted primary budget balance and the output gap is positive, e.g., the former increases when the output gap increases and vice versa. A positive relationship between these two categories may indicate that fiscal policy authorities conduct such policy measures that act in the direction of reducing output gap fluctuations (countercyclical). Those measures can be either on the expenditure side (by reducing expenditures) or on the revenue side (by increasing revenues) or both, in periods when the output gap increases and vice versa. The fiscal policy stance is procyclical when the relationship between the cyclically adjusted primary budget balance and the output gap is negative. This may indicate that fiscal policy authorities instead of reducing economic fluctuations conduct such policy measures that may amplify output gap fluctuations. For example, fiscal policy authorities may increase expenditures and/or reduce revenues when the output gap increases, which may ultimately boost economic fluctuations.

The size of the reaction of the discretionary fiscal policy stance in respect of economic fluctuations can be assessed by the fiscal impulse, which is calculated as the difference between the cyclically adjusted primary budget balances in two periods, expressed as a ratio of the potential output (Equation 6):

$$FI = \Delta \frac{CAPB}{Y^p} \quad . \tag{6}$$

If the discretionary fiscal policy stance is countercyclical, the size of the fiscal impulse should increase and eventually become positive in periods of economic downturns and vice versa. In contrast, if the fiscal policy stance is procyclical, the fiscal impulse should decrease and eventually become negative in periods of economic downturns and vice versa.

The size of automatic stabilizers as a ratio of the actual GDP (Y_T) can be calculated as the difference between the change in the overall budget balance (cyclically unadjusted balance) and the fiscal impulse, indicated as follows:

$$as = \Delta \frac{PB}{Y} - FI \quad . \tag{7}$$

Appendix 4

Data Description

Variable	Description	Expressed	Frequency	Source
Primary budget balance	Primary budget balance of the central government as a ratio of GDP, in real terms. The revenues and expenditures are deflated by the GDP deflator.	In %	Annual and quarterly	Authors' own calculations based upon data from the Ministry of Finance, State Statistical Office and the NBRM
Cyclically adjusted primary budget balance	Cyclically adjusted primary budget balance of the central government as a ratio of GDP, in real terms. The revenues and expenditures are deflated by the GDP deflator.	In %	Annual and quarterly	Authors' own calculations based upon data from the Ministry of Finance, State Statistical Office and the NBRM
Output gap - HP filter method 1990-2009	Output gap calculated according to HP filter method. The GDP series date back from 1990.	In %	Annual	Authors' own calculations based upon data from the State Statistical Office of the Republic of Macedonia
Output gap - HP filter method 1961-2009	Output gap calculated according to HP filter method. The GDP series date back from 1961.	In %	Annual	Petkovska and Kabashi (2011)
Model-based output gap	Model-based output gap calculated according to MAKPAM model used by the NBRM.	In %	Quarterly	Calculations by the staff from the Research Department of the NBRM, based upon data from the State Statistical Office of the Republic of Macedonia
Output gap - HP filter method 1997-2009	Output gap calculated according to HP filter method. The GDP series date back from 1997.	In %	Quarterly	Authors' own calculations based upon data from the State Statistical Office of the Republic of Macedonia
Stock of public debt to GDP ratio	The stock of total public debt (internal and external) of the general government as a ratio of GDP, expressed in nominal values. The annual data series start from 1999, whereas the quarterly data series start from 2006:Q1.	In %	Annual and quarterly	Ministry of Finance of the Republic of Macedonia
Dummy for the armed conflict in 2001	Dummy variable that aims to control for the armed conflict in the country in 2001. Value of 1 for 2001 and 2002, while 0 otherwise.	Dummy variable	Annual and quarterly	
Interactive slope dummy prior to 1996	Slope dummy variable that aims to control for the initial period of transition as well as the different monetary policy regime applied prior to 1996. Value of 1 for the period prior to 1996 and 0 otherwise.	Slope dummy variable	Annual	

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