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Cyclical Behavior of Fiscal Policy in the Western Balkans

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Abstract²

This paper studies the cyclical behavior of fiscal policy in the Western Balkans region, investigating empirically the fiscal policy response to business cycles for the period 2003-2016. Although there is a large empirical literature which has found that fiscal policy in developing countries is pro-cyclical, not many studies are found on the Western Balkans region, with only a few done at country level. We apply the Hodrick-Prescott (HP) filter and other filters to measure the potential output and output gap for each of the respective Western Balkans countries. By performing country regressions we find that one of the main determinants fiscal pro-cyclicality in the WB6 region is the quality of the government. We conduct a series of structural vector auto-regressions (SVAR) for each of the countries in an attempt to obtain further evidence on the reaction of fiscal policy to the business cycle.

Key words: Fiscal Policy, Business Cycles, Pro-cyclicality, Counter-cyclicality, Western Balkans

JEL classification: E32, E60, E62, E30, H6.

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1. Introduction

It is widely known from the Keynesian view that fiscal policy is usually a tool for dealing with output fluctuations, but growing literature is shown ambiguous results. In the last decade studies have shown that for developing countries fiscal policy behavior has been mainly pro-cyclical. A pro-cyclical fiscal policy from Keynesian view and also from the neo-classical view is suboptimal, therefore not desired. Frankel *et al.* (2013) brings empirical evidence that many developing countries are graduating, so passing the school of using pro-cyclical policies. After the 2009 crisis the focus on using fiscal policy has come back and better understanding of its effect especially in times of crisis are needed. The purpose of this paper is to study if the Western Balkans, have graduated from the cyclical behavior of fiscal policy using different approaches. Additionally, we intent to measure the impacts in the fiscal behavior rising from different structural shocks the economies of the Western Balkans might suffer, including output temporary crisis.

The paper is organized as follows. After this Introduction, Section 2 gives a briefly overview of the main papers, that have dealt with the cyclicity of fiscal policy, worldwide, and also in the western Balkans, showing some of their results. Section 3 deals with the methodological aspects of this paper, and with the data description. Here, we describe our methods for measuring fiscal policy cyclicity, calculating the output gap and the cyclical adjusted balance, giving an overview of the filtering techniques used and we explain the VAR methodology for seeing the effects of structural shocks. In Section 4, discusses our empirical results for dealing with fiscal policy cyclicity. Section 5 presents concluding remarks, while the Appendix shows extensive figures measured from our empirical analysis.

2. Literature review

The traditional Keynesian view argues that fiscal policy usually should be counter-cyclical and should be a tool used to reduce the effects of the business cycle. Gavin and Perroti (1997) were among the first to notice that this was not always the case. They saw for Latino America a phenomenon called pro-cyclicity, where fiscal policy was expansionary in good time and vice-versa. Later in 2004, one of the most influential papers over cyclicity came out from Kaminsky, Reinhart, and Vegh (2004), where they stated, that pro-cyclicity is present in many developing countries, while counter-cyclicity happened more in advanced economies. Lane (2003), checking evidence from the OECD countries provides results that countries with volatile output and dispersed political power are the most likely to run pro-cyclical fiscal policies. Similar results were also confirmed by Alesina and Tabellini (2005), where they give arguments that pro-cyclicity is influenced mostly by political distortions. Talvi and Vegh (2005), notice that while fiscal policy in the G7 countries appears to follow Barro's optimal smoothing rules, fiscal policy in developing countries is highly pro-cyclical. They explain pro-cyclicity due to the credit

borrowing constraints that are a common issue this countries face in times of crisis. Woo (2009), associate the problem of pro-cyclicality with the polarization of preferences related to social inequality. Aghion and Marinescu (2007), say that the counter-cyclicality of fiscal policy has increased over time, though additional studies are needed in middle income countries. Frankel *et al.*(2013) show that a third of the developing world has been able to escape the pro-cyclicality trap and actually become counter-cyclical, but still this has been depending on having stronger institutions. Garneiro and Garrido (2015) confirms the findings of Frankel *et al.* (2013), and of earlier findings in the literature, where they show that developing countries have a tendency to behave in a way that contributes to exacerbating the effects of the business cycle; tending to exhibit more often than industrialized economies pro-cyclical fiscal policies in both booms and downturns, contributing to exacerbate output volatility.

A few studies on the issue of fiscal policy cyclicality were also found about the western Balkans. Kabashi (2016) investigating the cyclical character of fiscal policy in transition countries, also of WB6, in the period from 1995 to 2011, using system GMM as the preferred estimation method, finds that discretionary policy in the Western Balkan countries has been pro-cyclical, thus aggravating economic fluctuations. Staehr (2008) finds that fiscal policy in the SEE EU member states is more countercyclical than in the Western European countries. Bezovska *et al.* (2011), in investigating the cyclical behavior of fiscal policy in the Republic of Macedonia during the period of transition, imply that the fiscal policy behavior prior to 1996 was pro-cyclical, whereas afterwards the fiscal policy became countercyclical. Gazidede (2013), in estimating the fiscal position of Albania through the Cyclically-Adjusted Budget Balance, finds that in the case of Albania fiscal policy shows pro-cyclical behavior during the years 2006, 2008, 2009, 2012, while in the years 2007 and 2010 the nature of fiscal policy is more counter-cyclical.

3. Methodology and data

3.1. Measuring Fiscal Cyclicality

Halland and Bleaney (2009) say that there is no consensus on how to measure fiscal cyclicality. The methods may start from measuring the correlation between the cyclical component of output with the fiscal variable as used also in Kaminsky *et al.* (2004), or move to regression-based measures between the fiscal variable and the output gap or cyclical component of output. Following a similar method as Aghion and Marinescu (2007), we estimate the following equation for each country i :

$$\frac{revenue_{it}-expenditure_{it}}{GDP_{it}} = c_{1it} + c_{2it} * Outputgap_{it} + \varepsilon_i, \text{ where } \varepsilon_i \sim N(0, \sigma_\varepsilon^2) \quad (1)$$

Where c_{2it} measures the cyclicality of fiscal policy and a positive sign of it means that the budget surplus increases (so the difference $revenue_{it} - expenditure_{it}$ becomes more positive) when the economy is in expansion, so the fiscal policy is countercyclical and vice-versa when the sign in front of c_{2it} is negative. The variables in equation (1) are defined as follows: $revenue_{it}$ are the total revenues of the budget for each of the countries, $expenditure_{it}$ are the total expenditures of the budget for each of the countries, their difference when is positive shows a budget surplus and when negative it shows a budget deficit. In order to assess the quality of government impact on the fiscal balance and on fiscal cyclicalilty we have decided to experiment and see the effects by including two variables as proxy-s for government quality, the control for corruption and government effectiveness.

$$\frac{revenue_{it}-expenditure_{it}}{GDP_{it}} = c_{1it} + c_{2it} * Outputgap_{it} + Controll_corruption_{it} + \varepsilon_i, (2)$$

$$\frac{revenue_{it}-expenditure_{it}}{GDP_{it}} = c_{1it} + c_{2it} * Outputgap_{it} + GovernmentEffectiveness_{it} + \varepsilon_i ,(3)$$

Since both variables might be highly correlated with each other they are not included together, rather one by one.

3.2. Calculating the Output gap and Cyclical Balance

The Output gap is computed as:

$$Output\ gap_{it} = \left(\frac{Nominal\ GDP_{it}-Potential\ GDP_{it}}{Potential\ GDP_{it}} \right) * 100 \quad (4)$$

An increasing $Output\ gap_{it}$ shows an economic situation of expansion while a negative one, a situation of recession. The real issue when calculating the output gap is the estimation of the Potential GDP. As suggested by De Jong and Sakarya (2013) some of the most used techniques are the filtering or the statistical smoothing conducted in a series, separating the trend from the cycle. In our estimation we will use the filters of Hodrick-Prescott (HP)³ (Hodrick and Prescott (1997)); the Baxter – King filter (Baxter and King (1995)); the Christiano-Fitzgerald filter (Christiano and Fitzgerald (2003); Butterworth filter (Butterworth, 1930); and Corbae-Ouliarisfilter (Corbae and Ouliaris (2006)). The Hodrick-Prescott Filter is used among macroeconomists to obtain a smooth estimate of the long-term trend component of a series Y_t . The series may be decomposed into a trend or growth component g_t and a cyclical component c_t . The Hodrick–Prescott filter effects such a decomposition by minimizing the following equation:

³In our case we will use a parameter of $\lambda = 1600$ as usually suggested for quarterly data.

$$\sum_{t=1}^T (y_t - g_t)^2 + \lambda \sum_{t=2}^{T-1} ((g_{t+1} - g_t) - (g_t - g_{t-1}))^2 \quad (5)$$

The Baxter-King filter suppresses both the low and the high frequency components in a series Y_t which has the following representation: $Y_t = \int_{-\pi}^{\pi} e^{i\omega} dZ(\omega)$ (6) and from Y_t it extracts the component by

$$\text{applying a bandpass filter} \quad c_t^* = \int_{-\pi}^{\pi} F^*(\omega) e^{i\omega} dZ(\omega) \quad (7)$$

The Butterworth filter (Butterworth, 1930) as explained also by Pollock (1999) is an approximation to an “ideal” square-wave filter. It divides the spectrum of a time series into a pass-band and a stop-band; where the gain is 1 for the pass-band and 0 for the stop-band. The Christiano-Fitzgerald filter as explained by Christiano and Fitzgerald (2003), identify one approximation which is optimal when the series is a random walk and it minimizes the means squared error between the true series and the estimated one. The Corbae-Ouliaris filter, according to Corbae and Ouliaris (2006), overcomes some of the shortcomings of the HP and Baxter-King filter therefore it might be useful as an alternative method. The issue with potential output filter estimations is that sometimes the results for different technical aspects might often be ambiguous and contradictory with the perception that economic experts might have over the potential of an certain economy. Therefore the choosing of the filter is also up to the expert using them upon story convenience.

Returning to the fiscal balance cyclicity, today many governments for transparency and for a better representation of the fiscal position of the country are widely presenting in their balance sheets also the cyclically-adjusted fiscal balance. In our case we will calculate the Western Balkans countries fiscal balances off cyclicity using the Huidromet *al.* (2016) approach where the cyclical balance is given as:

$$\text{Cyclical balance} = \text{revenues} * (1 + \text{output gap})^{-1} - \text{expenditures} * (1 + \text{output gap})^{0.1} \quad (8)$$

Where it has been assumed an output gap elasticity of 1⁴ for revenues and an elasticity close to zero for expenditures.

3.3. Fiscal Deficit effects rising from shocks in output

We use Structural Vector Autoregressive (SVAR) models to measure the effects of the business cycle on the fiscal policy. The SVAR model sheds light on the relationship between the output gap and the fiscal deficit and how this relationship affects later the fiscal deficit. As noticed also in Huidromet *al.* (2016), the

⁴ Usually revenues are thought of being affected mostly by the business cycle, while expenditures almost not at all.

SVAR model isolates the responses of fiscal policy⁵ to exogenous shocks to the macroeconomy. Blanchard and Perroti (2002), via a recursive identification scheme identifies the shocks to fiscal policy and economic activity. Following a similar approach, starting it from a basic VAR specification we would have: $Y_t = c + A(L)Y_{t-1} + e_t$, $E\{e_t e_t'\} = \Sigma e$ (9), where y contains n variables and p lags in the VAR. In our case we will have only two variables, the fiscal deficit and the output gap, therefore our equation would look like in a matrix form:

$$\begin{bmatrix} 1 & a_{12} \\ a_{21} & 1 \end{bmatrix} \begin{bmatrix} Fiscal\ deficit_t \\ Output\ gap_t \end{bmatrix} = \begin{bmatrix} b_{10} \\ b_{20} \end{bmatrix} + \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix} \begin{bmatrix} Fiscal\ deficit_{t-1} \\ Output\ gap_{t-1} \end{bmatrix} + \begin{bmatrix} e_{fiscal\ deficit,t} \\ e_{output\ gap,t} \end{bmatrix} \quad (10)$$

where we need to identify to get $\begin{bmatrix} 1 & a_{12} \\ a_{21} & 1 \end{bmatrix} = A$, and we need to impose restrictions on A . Therefore, the SVAR identification is about imposing restrictions on matrix A . In our case we will use the classic and most popular SVAR variant, which consists in an implementation of the Cholesky decomposition-based approach as offered by Gretl⁶.

3.4. The data description

For our study we will use mainly quarterly data. For most of the analysis and estimations we will use data from 2003-Q1 to 2016-Q3, by having in total a minimum of 55 observations. The main sources of data are the WIIW⁷ for quarterly data, the IMF World Economic Outlook for yearly data and the World Bank Governance Indicators dataset for the data⁸ on Control of Corruption⁹ and for Government Effectiveness¹⁰. For the countries that lack quarterly data in the early years we have used Litterman (1993) interpolation method to recreate quarterly data. All the data used in the regressions are seasonally adjusted using Tramo/Seats method. The econometric software(s) used for this work are Eviews and Gretl. The abbreviations such as Alb (Albania), Ks (Kosovo), BH (Bosnia and Herzegovina), Montenegro (Monte), Macedonia (FYROM), Serbia (Sr), WB6 (6 Western Balkans countries) are used in the tables or figures.

⁵ In our case represented by the fiscal deficit.

⁶ Econometric software

⁷ The Vienna Institute for international Economic Studies

⁸ Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance)

⁹ Reflects perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

¹⁰ Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

4. Empirical results

We have calculated the potential output for all the countries, according to all the methods mentioned in section 3.2, and we use them to estimate the output gaps as suggested by equation (4). Putting equation (4) results into equation (1), and estimating the regressions for each country we obtain the results of fiscal deficit cyclicalities as seen in table 1.

Table 1: Fiscal Cyclicalities coefficient estimations

	Baxter-King	Butterworth	Christiano-Fitzgerald	Corbae-Ouliaris	Hodrick-Prescott
Albania	0.27	0.21	0.33	0.06	-0.18
Bosnia-Herzegovina	-0.13	-0.06	-0.10	-0.11	0.06
Kosovo	0.10	-0.18	0.11	0.13	-0.10
Macedonia	0.04	-0.52	0.00	0.12	-0.13
Montenegro	-0.08	0.72	-0.06	-0.06	0.15
Serbia	0.41	-0.48	0.31	0.43	-0.45

Estimation period: 2003Q1 - 2016Q3

n = 55 for each country

Source: Author's Calculations (2017)

Our results show that on average the fiscal policy of Albania, Kosovo and Serbia seem to be somehow counter-cyclical. The opposite is noticed for Bosnia and Herzegovina and Montenegro whose policy looks on average pro-cyclical. On the other hand Macedonia is the only one whose policy although looks pro-cyclical, has some tendency to be a-cyclical. The results are a bit contradictory for Albania, Kosovo and Serbia, where as seen from section 2, developing countries have mostly pro-cyclical fiscal policies. As expected for some of the countries, the filters used do not show similar results, and the choosing of only one filter for continuing the analysis it is done intuitively. In our case we have decided to use as a measure of the potential output the filter that shows the median results in terms of fiscal cyclicalities, as highlighted in Table 1¹¹.

In addition, estimating¹² the equations (2) and (3), we are able to obtain the government quality impact on the deficit. From the results presented in table 2, we can see that economically both the proxy(s) used for government quality are economically significant, although not always statistically significant.

¹¹ In the appendix, Figure 2 illustrates the output gaps gained from the estimations using only the highlighted filters for the respective countries.

¹² All the models estimated in table 2, are checked if they fulfill Gaus-Markov assumptions for the OLS method. We have checked for Heteroskedasticity (Breuch-Pagan test), Functional form (Reset test), Normality (Jacque-Bera test), Serial Correlation (this explains the AR(s) added into the regression. For Macedonia we have used robust least squares method as the tests indicated some issue of

Table 2: Government quality effects on the fiscal balance

Method:	Albania		Bosnia Hercegovina		Kosovo		Macedonia		Montenegro		Serbia	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
	LS		LS		LS		Robust Least Squares		LS		LS	
	Coefficient		Coefficient		Coefficient		Coefficient		Coefficient		Coefficient	
	<i>(p-value)</i>		<i>(p-value)</i>		<i>(p-value)</i>		<i>(p-value)</i>		<i>(p-value)</i>		<i>(p-value)</i>	
C	(1.64)	(3.07)	1.78	(0.75)	(7.78)	5.87	(3.07)	(3.42)	(3.13)	(1.13)	(4.92)	(3.85)
	0.17	0.00	0.42	0.76	0.10	0.15	-	-	0.35	0.48	0.00	0.00
OUTPUTGAP_BT_ALB	0.49	0.43	(0.13)	(0.10)	0.18	0.09	(0.10)	(0.10)	(0.09)	(0.09)	0.07	0.12
	0.04	0.09	0.20	0.28	0.23	0.65	0.34	0.40	0.61	0.62	0.90	0.83
CONTROLL_CORRUPTION	4.10		5.63		(12.57)		(5.89)		(2.88)		(4.07)	
	0.04		0.37		0.08		-		0.83		0.09	
GOVERNMENT_EFFECTIVENESS		3.34		(0.97)		15.12		(5.81)		(9.25)		(2.31)
		0.12		0.75		0.19		-		0.28		0.20
AR(1)	0.49	0.49	0.86	0.85	0.12	0.12			0.27	0.23	0.35	0.36
	0.01	0.01	-	-	0.38	0.46			0.14	0.30	0.00	0.00
AR(2)					0.09	0.10			0.27	0.24	0.26	0.24
					0.51	0.58			0.10	0.29	0.06	0.07
AR(3)					(0.22)	(0.20)						
					0.06	0.07						
AR(4)					0.63	0.63						
					0.00	0.00						
Adjusted R-squared	0.28	0.25	0.72	0.72	0.44	0.44	0.34	0.25	0.16	0.18	0.29	0.27
Included observations	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00
F-statistic	6.16	5.52	36.35	35.67	7.12	7.09			2.98	3.43	5.45	5.08
Durbin-Watson stat	1.96	1.94	2.18	2.21	1.71	1.68			2.04	2.03	2.08	2.05

Source: Author's Calculations (2017)

The positive sign in front of the coefficient for both variables for eg. Albania, show that the higher is the government effectiveness and the higher the control for corruption (so a reduction of it), the higher will be the government surplus, while for Serbia are shown opposite results where it seems that the government deficit increases in this case. The including of government quality indicators in the regressions seem to make the Albanian fiscal policy more counter-cyclical than in the initial estimations, the Serbian less counter-cyclical, the Macedonian more pro-cyclical, while the fiscal policy of Bosnia-Herzegovina, Kosovo and Macedonia remain on the same path without too much change.

By estimating the SVAR from the equation (10), we are able to investigate further the effects of the cycle in the fiscal policy for the WB6 countries. We have included¹³ in the VAR 4 lags for Albania, 2 for Bosnia-Herzegovina, 2 for Macedonia, 1 for Kosovo, 2 for Montenegro and 6 for Serbia. In figure 1, we can see the impulses obtained from Cholesky decomposition-based approach, where we show¹⁴ the effects of the output gap on the fiscal deficit. The interpretation of figure 1, taking as an eg. Bosnia-

Homoskedasticity. The Residuals mostly suffer from lack of normality, but this problem comes mainly because of some outliers in the data, and it can be skipped.

¹³ For quarterly data, usually it is recommended using 4-8 lags, while in our case by watching the Inverse Roots graph and using the information criteria of Akaike and Schwarz we have come upon with this choice of lags.

¹⁴ The vice-versa results are not included as they were not relevant for the current analysis.

Herzegovina would be: When a positive shock in the output gap hits the Bosnian economy, with the output gap which increases, this will result with a positive effect in increasing the Bosnian fiscal surplus. The effect starts showing after 2-3 periods, and it reaches a top impact within 5 periods, starting to slow down after it, till it almost disappears around the 13th period. The opposite interpretation is valid when we take into consideration a negative shock in the output gap.

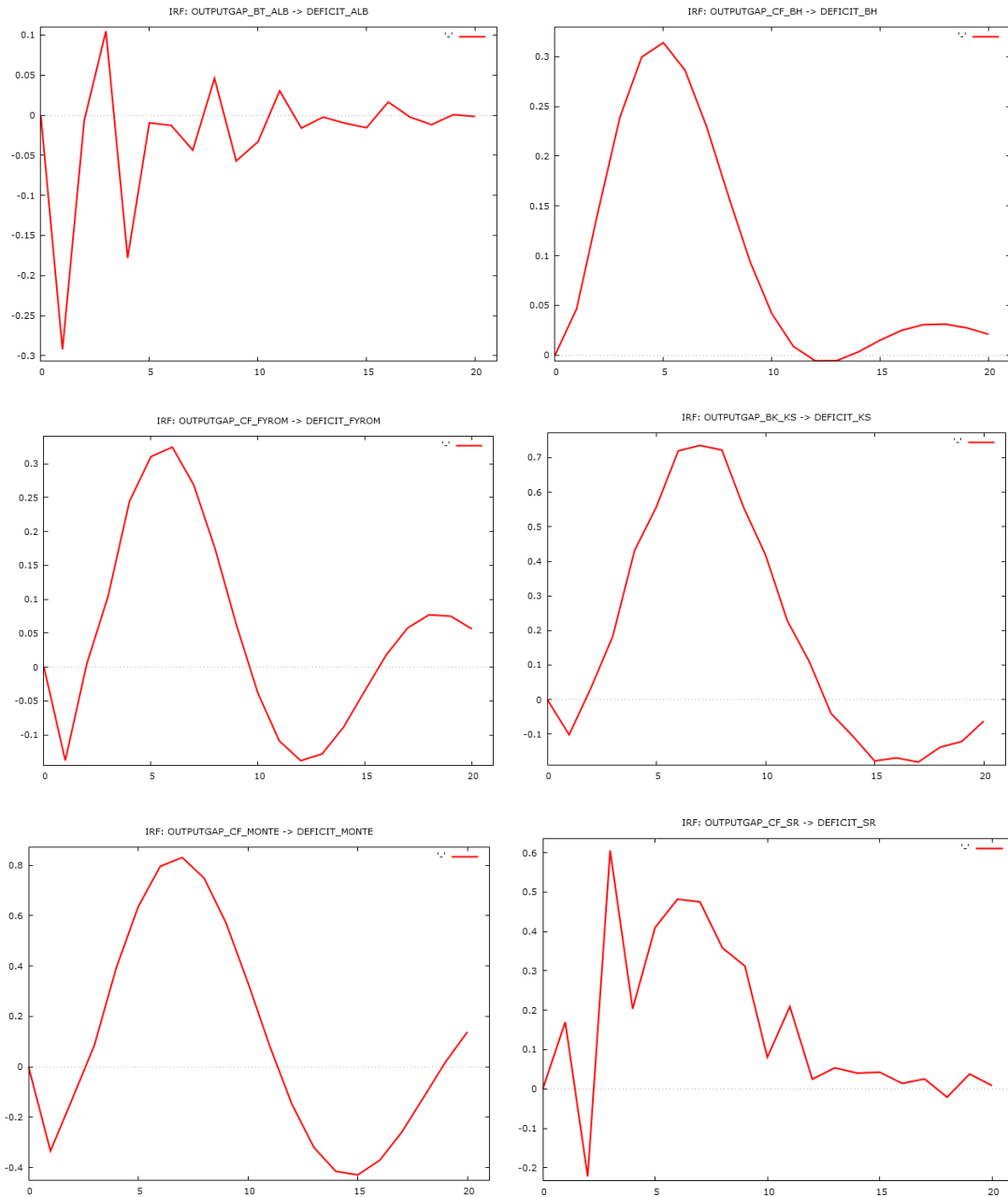


Figure 1: The impulse response from the output gap shock(s)

Source: Author's Calculations (2017)

In the case of Albania the shock impact is a bit not clear, though it seems that on average, it looks that it increases temporarily the fiscal deficit, but this effects is reflected only after 1-2 periods, starting to disappear around the 6th period. In general we can see that for all countries there is a big impact of a structural shock in the output gap to the fiscal balance, suggesting that the business cycle really affects the deficit in the WB6 countries. These results are also confirmed by the Forecast Error Variance Decomposition¹⁵, which it shows better understanding of the relationship between the output gap and the fiscal balance. The Forecast Error Variance Decomposition shows to us the proportion of movements of a variable due to shocks to itself and to other variables. The forecast error variance of the fiscal balance for all the countries at longer horizons (till 20 periods) it is explained from the output gap shocks at a range from 10-16% of all the variance.

5. Conclusions

Our main results show that on average fiscal policy in Albania, Kosovo and Serbia have counter-cyclical behavior, graduating from the fiscal policy issue of pro-cyclicality, but contradicting Kaminsky *et al.* (2004) results for the developing countries. For Bosnia and Herzegovina, Montenegro and Macedonia the results are not that satisfying, showing respectively pro-cyclical, pro-cyclical and a-cyclical behavior, by suggesting the need for fiscal policy changes in this countries toward counter-cyclical way. In investigating further the causes of fiscal cyclicality and relating it with government quality, we proved empirically that the fiscal policy approaches of the WB6, thought might not be strong enough to change fiscal policy direction they have amplifying effects. If WB6 countries fight more corruption and increase government effectiveness, their fiscal policy will be more effective.

In general, if all the WB6 countries are hit by a structural shock in the output gap, the fiscal balance effect from the business cycle will be considerable and important. This finding is also confirmed by the forecast error variance of the fiscal balance for all the countries, where the output gap shocks explain on average almost 2% of the fiscal balance variance. As result, better fiscal policy designing are needed in general for the Western Balkan countries in order for them to be able to copy with challenges arising from the business cycle, such as future possible crisis. A solution to better understanding fiscal cyclicality effects would be the using and calculation by the governments of the Cyclically Adjusted Fiscal balance as suggested by Frankel (2011)¹⁶.

¹⁵ See Figure 4 in the Appendix

¹⁶Figure 3 in the Appendix shows the Cyclically Adjusted Fiscal Balance calculated for the WB6.

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Appendix

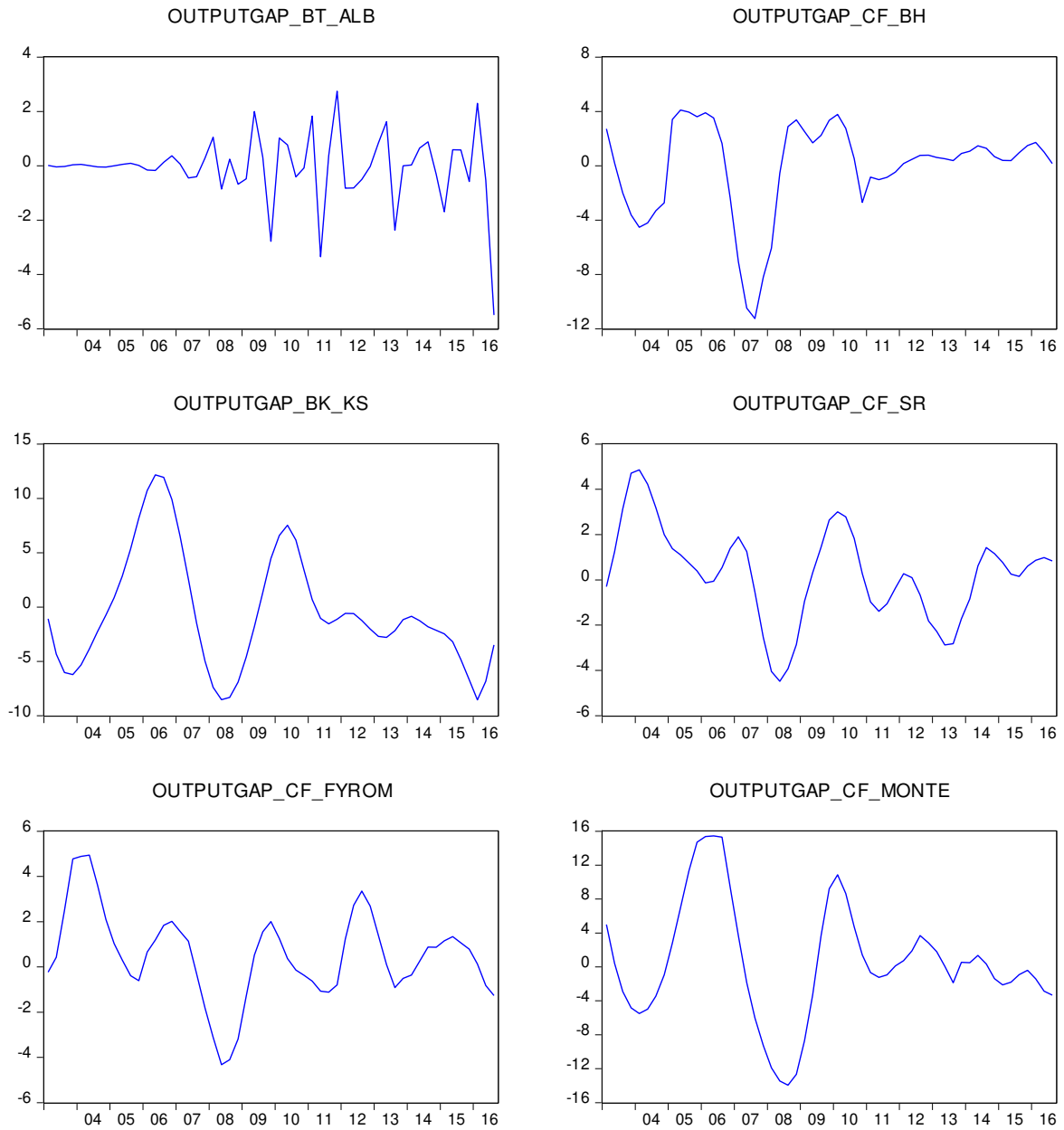


Figure 2: The output gaps of the chosen filters

Source: Author's Calculations (2017)

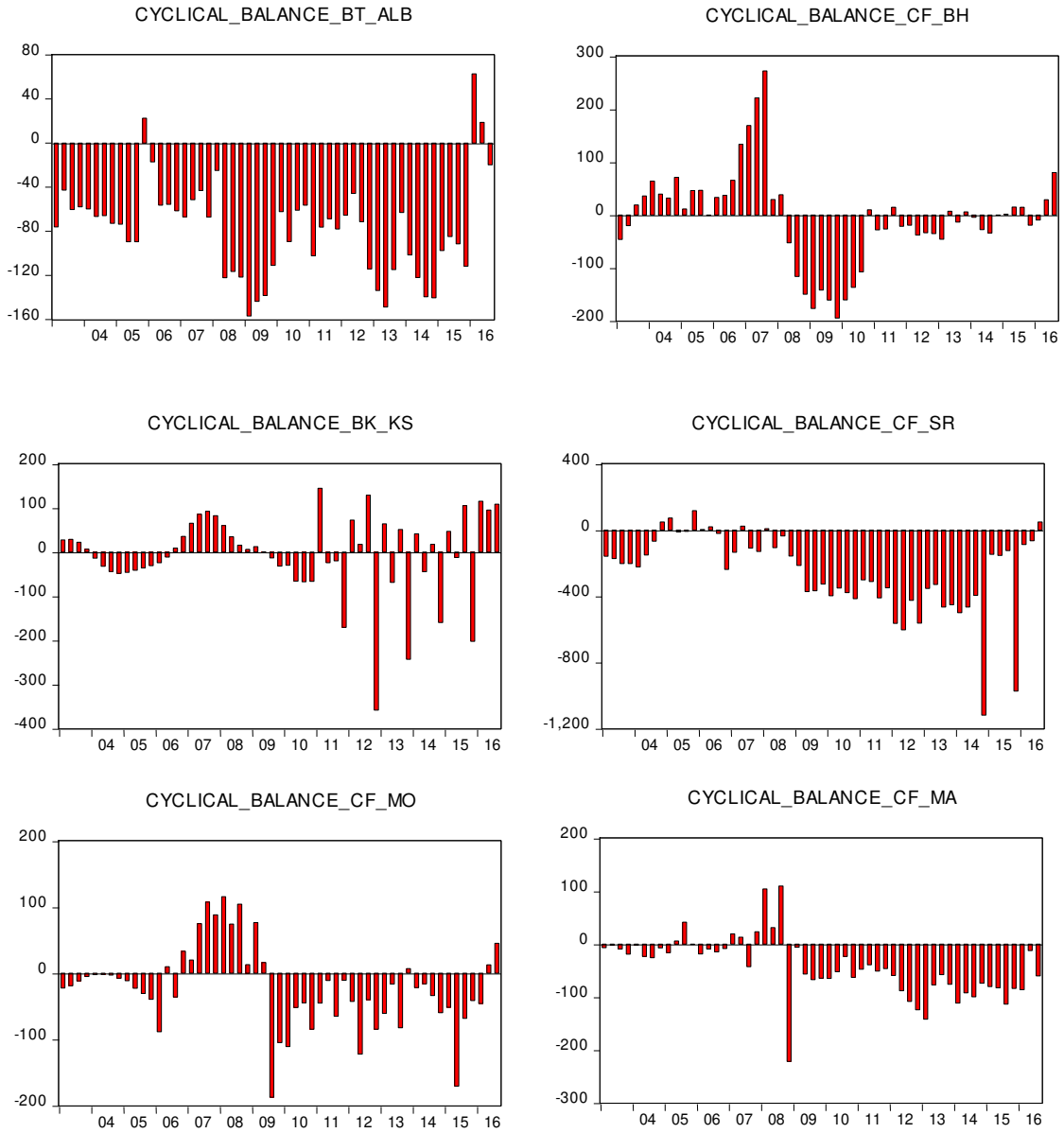


Figure 3: The cyclical balances of the chosen filters

Source: Author's Calculations (2017)

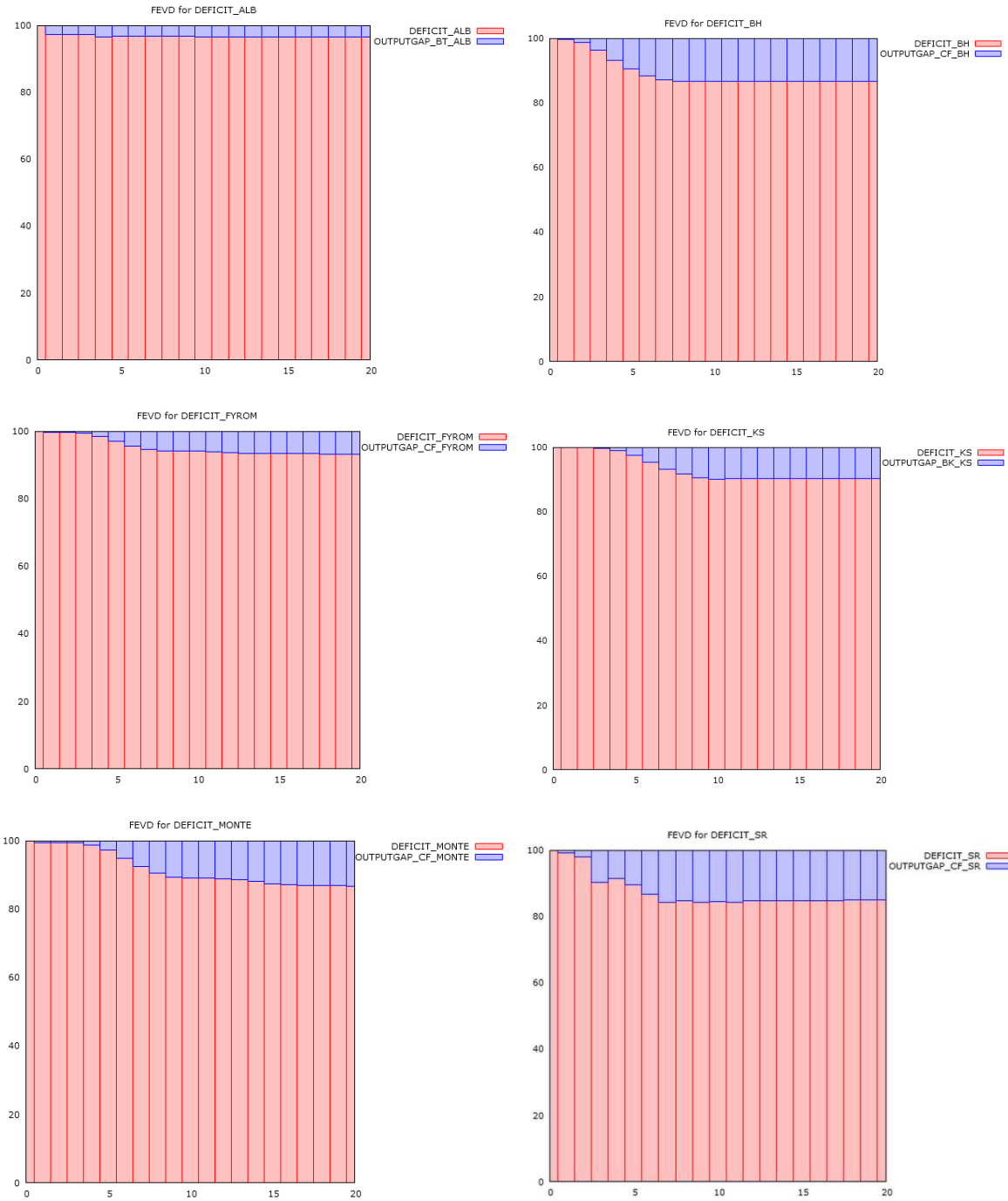


Figure 4: The forecast error variance decomposition

Source: Author's Calculations (2017)