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STOCK MARKET RESPONSE TO FISCAL POLICY SHOCKS: EVIDENCE FROM EU COUNTRIES FROM CENTRAL AND EASTERN EUROPE

Empirical Study

Keywords
Fiscal policy,
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VAR,
Financial crisis

JEL Classification
E62, H50, D53, C50, G01

Abstract

Expanding the existing literature regarding the relationship between fiscal policy and sock market, this paper will analyse the response of stock markets from Central and Eastern Europe (Bulgaria, Check Republic, Slovakia, Poland and Romania), to a deviation in fiscal policy by using a Vector Autoregressive model (VAR) for quarterly data, for the period 2004-2015. The effect of crisis over stock market performance is significantly negative for all analysed countries, while governmental expenditure increased in Bulgaria, Check Republic, Slovakia and Romania, and governmental revenues increased only in Check Republic, Hungary and Slovakia. The paper highlights that an increase of stock market performance leads to a decrease of governmental expenditure in Slovakia, Romania, Check Republic and Bulgaria, due to the existence of a performant private sector which comes and compensates the investments. The Romanian's governmental expenditure decreased considerably in comparison with other countries. Also, in Poland case, there is no relation between stock market performance and governmental expenditure.

INTRODUCTION

The fiscal policy stance is considered in financial literature the most important tool to be taken into consideration carefully by investors and central authority when they decide to make changes in economic instruments. But in the other part, stock market is an important intermediary between financial markets in an economy because an increase of expenditures and debt have large opportunities to increase the interest rate and by increasing the interest rates it will lead to a lower stock market performance (Tobin, 1969).

Thus, even if monetary policy is considered a determinant policy on stock market its impact depends too much from the fiscal policy stance (Jeong J., 2006). This can be explained by the fact that the crowding out effects are much higher while a government debt increases which lead to a significant increase of interest rates and higher capital income tax rate (Gomes, Michaelides & Polkovnichenko, 2012).

The innovation of this work is to full fill these arguments concluded from these previous studies and to examine the impulse responses of stock market return to fiscal policy using a VAR model focusing the analyses on six stock markets from EU countries from Central and Eastern Europe.

This paper is structured as follows: the second section, reviews the literature; the third section, describes the methodology used, showing the data selection process and the sample characteristics; the fourth section reports the results. Finally, in the last section there are concentrated the conclusions of the study.

LITERATURE REVIEW

The stock market activities require fiscal discipline with an influence in the economic growth but in the other side the stock market performance has a mobilization function by allocation the funds in that resources that can help the economy to grow up. Due to the fact of the fiscal policy as an intersection instrument between politics and central authority, this have a very important role in determining the objectives of fiscal policy to influence the economy. This paper tries to analyse this aspect more closely.

The influence of fiscal policy over the stock market was analysed by many researches and mixed results have been produced testing this impact, such as: Roley & Schall (1988) and Darrat (1990) testing the effect of fiscal policy in Germania, UK and Canada concluded that government deficit has an influence over the stock market performance; Syed, Ali and Hasan (1993) demonstrated that respecting the fiscal policy does not conduce to a performing stock market in Canada and in Nigeria; Laopodis (2009), Tagkalakis (2010), Osahon & Dickson (2013), Reddy & Agrahari (2012) and Montasser, Gupta, Jooste & Miller (2015), explained this reason is strongly linked with the increase of the governmental deficit and the decreasing of the market participants believes to invest and also stock market has an influence over the primary deficit which will increase the external government expenditures and also the cost of fiscal policy with a negative impact to the economy. This is possible because shocks in governmental expenditures have a negative effect on stock market and an increase of taxes leads to lower excepted returns in stock market (Afonso & Sousa, 2008, 2010, 2011; Tavares & Valkanov, 2003). It can be said that fiscal policy is a desirable policy option, the contraction of which induce to crowding out effects and stock market may help toward fiscal consolidation (Agnello & Sousa, 2013).

Moreover, the policy makers must take in consideration also the evolution of stock market return which can affect in positive and significant manner primary balances, which means an increase in government revenues and a fall in government spending. In the other side Aye, Balcilar, Gupta, Jooste, Mille & Ozdemir, (2014), concluded that fiscal policymaker find difficult to achieve an equilibrium to stabilize the stock market.

Earlier studies have looked at one or two channels for transmission of fiscal policy to stock market. Foresti and Napolitano (2016) have demonstrated the reaction of stock market to public investment and taxation and they have suggested that central authority must take account of stock market oscillations and monetary policy reaction when they take changes in fiscal instruments. Ogbulu, Torbira, and Umezinwa (2015), trying to know the nature of relationship between the fiscal policy and stock market in Nigerian capital market (during the period 1985 – 2012), they concluded that even if money supply has a significant influence on stock prices the fiscal policy has a profound impact and must be incorporated carefully according with the needs of capital market potential.

Going further, Shioji and Morita (2014) pointed out that a previous fiscal rule implemented has a significant impact on future economic growth and an anticipated fiscal policy leads to a future increase in stock market returns. Due to the fact of the stock market that indicates negative response to taxes and spending and the deficits (Laopodis, 2009), investors must consider the budget deficit problem and the fiscal rules implemented because these anticipated rules lead to a strong economy increasing the credibility of investment in the future (Roley & Schall, 1988).

Despite the above facts, the empirical linkage between the fiscal policy and stock market in developed countries and few in emerging countries has not been a good understanding of the transmission mechanism of fiscal policy measures to stock market. The objective of this paper is to investigate how stock market responds to a change in fiscal instruments in Central and Eastern European countries; at what portion the stock market is affected by public expenditures and revenues due to fiscal policy changes.

METHODOLOGY

The model

This paper examines the full dynamic relationship among fiscal policy and stock market performance, using the VAR framework. The motivation of this approach comes from the mechanism of impulse responses which have been used in previous studies such is Chatziantonioua, Duffya & Filis, (2013) which emphasize the stock market response to monetary and fiscal policy shocks. This paper will extend the model to examine the accumulated impulse responses of different regimes of public expenditures and revenues with long term effect over the stock market performance.

$$R_{i,t,q} = \alpha_{i,0} + \alpha_{i,1} \cdot REV_{i,t,q} + \alpha_{i,2} \cdot CH_{i,t,q} + \varepsilon_{i,t,q}$$
(1)

where the $R_{i,t,q}$ is the return market for each quarter for country i, for year t and quarter q; $REV_{i,t,q}$ - government revenue as a percentage from GDP for the country i for year t and quarter q; $CH_{i,t,q}$ - government expenditures as a percentage from GDP for the country i, for year t and quarter q; $\alpha_{i,0}$, $\alpha_{i,1}$, $\alpha_{i,2}$ - represent the model's parameters for country i and $\varepsilon_{i,t,q}$ - error terms of the model for country i.

Data and descriptive statistics

Data sample used in the analysis formed by main six stock market indices from Central and Eastern European Union countries: BET for Romania, BUX for Hungary, PX for Czech Republic, SAX for Slovakia, SOFIX for Bulgaria and WIG for Poland are available for the period 2004-2015. Using the official exchange rates from European Central Bank the indices values are expressed all in EURO. From Eurostat data base it has been obtained quarter data for government expenditures and revenue expressed as a percentage of GDP.

The quarter indices return are calculated based on initial and final prices index for each quarter, based on following formula (2):

$$R_{i,t,q} = \frac{P_{i,t,q+1} - P_{i,t,q}}{P_{i,t,q}} \cdot 100 \qquad (2)$$

The descriptive statistics for the analyzed indicators, for period 2004Q1 – 2015Q4 are given in Table No.1 in Appendix A. To see a clear picture for the evolution of each analyzed indicator, we present the descriptive statistics divided per each country.

At first glance, it can be observed that the highest level of stock market return is recorded in Romania (3.55%) while the lowest level belongs to Slovakia (1.20%), Bulgaria (1.45%). Both, the highest level for average expenditures (50%) and average government revenues (45%) are recorded for Hungary. The lowest values are recorded for Bulgaria and Romania, for both variables.

Regarding the financial crisis effect on fiscal policy, we identified different manner of impact. While the governmental expenditure increased in Bulgaria, Check Republic, Slovakia and Romania between 1 percentage points (pp) to 3 pp, comparing with period before financial crisis (2004Q2 – 2008Q1), the governmental revenues increased only in Check Republic, Hungary and Slovakia.

When we speak about financial crisis impact over stock market performance, the effect is clearer and the same for all countries. The stock market returns for each country, decreased in average during the period crisis from 7 pp (Check Republic, Hungary, Poland, Slovakia) to 10 pp in Romania and 12 pp in Bulgaria.

RESULTS

The Vector Autoregressive method enables to restrict the covariance matrix of reduced-form residuals to obtain economically interpretable impulse responses. For this reason, in figures in Appendix B we have an overall picture regarding the responses of stock market to fiscal policy and invers per each country separately.

In the Figure No.1, when the performance of stock market of Bulgaria increases, the governmental expenditures decrease for a period of four quarters after that there is no impact. In the same time the governmental revenue responds with an immediate increase after the second quarterly continuing the same in all the coming period under analysis.

Also it can be seen that fiscal policy can impact in two ways the stock market performance in Bulgaria: public expenditures influence negatively having a very little positive effect and public revenue have a positive effect.

In Check Republic case, the impulse response can be seen in the Figure No.2, based on which we can observe that the governmental expenditure response to the increase of stock market return is negative, declining in constant after the second quarter, and the governmental revenue is slightly positive.

Regarding the fiscal policy impact, we can see that governmental expenditure grow a bit after that there is no more impact and governmental revenue declines significantly in first 2 quarters

In Hungary (Figure No.3), the process of governmental revenue decline result is increasing the stock market performance while governmental expenditures remain slightly unstable in the first period of four quarterly and after that is recorded an increase.

Thus, we can see that Hungarian stock market performance is positively affected by an increase of public expenditure.

Going further, (in Figure No.4) we highlighted that stock market return responds positively after the first quarter when the state of Poland increases public expenditure and negatively when an increase of public revenue has been occurred. But when the stock market becomes more performing it can affect positively the public revenue, having approximately no effect over the public expenditure in Poland.

In the case of Romania (Figure No.5) it is observed that the stock market performance has a significant negative impact on fiscal policy response (public expenditure and revenue) but on the other hand stock market performance reacts negatively to public expenditures and a little slightly positive on public revenue.

For Slovakia (Figure No.6) fiscal policy becomes more efficient when the stock market becomes more performant: public revenue significantly increases and public expenditure decreases. Moreover, the stock market responds negatively to public expenditure and positively to public revenue.

It can be said that the stock market performance responds negatively to an increase of governmental expenditures and positively to an increase of governmental revenue in Bulgaria, Slovakia and Romania. While in Check Republic, Hungary and Poland the stock market performance increases to an increase of governmental expenditure and decreases to an increase to governmental revenue.

In Bulgaria, Check Republic and Poland and a little bit in Slovakia, governmental expenditures decrease and the governmental revenue increase when the stock market in these countries becomes more performant. Exception makes Hungary where this relation is backwards and Romania where the stock market has a negative influence over the fiscal policy. This result can explain the weakness of fiscal policy in Romania.

CONCLUSIONS

This study used VAR model to investigate the impact between stock markets and fiscal policy, from the EU countries from the Central and Eastern Europe region, for period 2004 – 2015, using quarter data.

Over the analysed period, it is brined out evidence that in Bulgaria and Slovakia between stock market performance and governmental expenditure there exists an inverse relation and between stock market performance and governmental revenue a direct relation. This can be explained that based on public revenues Check Republic, Hungary and Poland make public investments which drives the economy and private sector and thus the capital market activity. In the same time, we can see that in Check Republic, Hungary and Poland does not exist a strict relation. The negative impact of public revenue to stock market performance in Check Republic, Poland and Hungary is due to increasing of taxation affecting revenues from capital market.

Exception makes Romania where both the public revenue and expenditure decrease with an increase of performance of stock market. This result could be stated that on one side the state will spend more money in investments because the private sector will compensate this, and on the other side, the state will keep a lower level of taxation to not struggle the efficiency of stock market performance.

Going further, it might be said that all the conclusions are logical: an increase of stock market performance which induces to decrease of governmental expenditure means that the economy in Slovakia, Romania, Check Republic and Bulgaria is stable and the private sector comes and compensates, the state has no need to spend too much. The Romanian's governmental expenditure decrease considerably in cooperation with other countries. In the case of Poland, there is no relation between stock market performance and governmental expenditure.

Moreover the effect of crisis over stock market performance is significantly negative for all analysed countries: stock market returns decreased in average during the period crisis from 7 pp (Check Republic, Hungary, Poland, Slovakia) to 10 pp in Romania and 12 pp in Bulgaria. When we are speaking about fiscal policy, it seems that governmental expenditure increased in Bulgaria, Check Republic, Slovakia and Romania, while governmental revenues increased only in Check Republic, Hungary and Slovakia, comparing with period before financial crisis (2004Q2 – 2008Q1).

Further research can extend also the sample of analysed countries, but also the period which can be analysed.

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ANNEXES

Appendix A

Table No.1
Descriptive statistics

Indicator	Country	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis
Market Return	Bulgaria	1.45%	1.88%	34.59%	-54.74%	17.22%	-0.4347	4.2753
	Czech Republic	1.56%	1.90%	32.50%	-34.63%	12.41%	-0.2246	4.0778
	Hungary	2.39%	2.87%	57.04%	-40.93%	16.94%	0.2567	4.6877
	Poland	2.91%	3.98%	33.28%	-40.41%	13.82%	-0.5453	4.1607
	Romania	3.55%	3.18%	46.15%	-36.63%	18.19%	-0.1123	3.1693
	Slovakia	1.20%	0.67%	39.88%	-20.80%	10.57%	1.6420	7.7379
Expenses (% of GDP)	Bulgaria	37.07%	36.55%	54.40%	27.60%	5.81%	0.9387	4.0866
	Czech Republic	42.06%	42.25%	50.10%	36.20%	2.51%	0.1503	4.3457
	Hungary	49.64%	49.10%	59.00%	45.60%	2.99%	0.9406	3.7441
	Poland	43.60%	43.55%	47.80%	41.00%	1.64%	0.4977	2.6931
	Romania	36.97%	36.05%	49.90%	28.10%	5.24%	0.3908	2.4220
	Slovakia	39.97%	40.25%	49.10%	32.90%	3.62%	0.0801	2.4957
Revenues (% of GDP)	Bulgaria	36.75%	35.90%	46.70%	29.60%	4.34%	0.2812	2.0949
	Czech Republic	39.55%	39.70%	43.00%	35.10%	1.63%	-0.5533	3.4354
	Hungary	45.05%	44.70%	49.40%	39.80%	2.45%	-0.2362	2.4126
	Poland	39.51%	39.50%	45.50%	34.10%	2.29%	-0.1543	3.0856
	Romania	33.83%	33.40%	42.30%	26.00%	4.23%	0.3741	2.1716
	Slovakia	36.31%	36.30%	42.10%	31.40%	2.39%	0.0305	2.4538

Source (own research based on the analysis of descriptive statistics)

Appendix B

Figure No.1
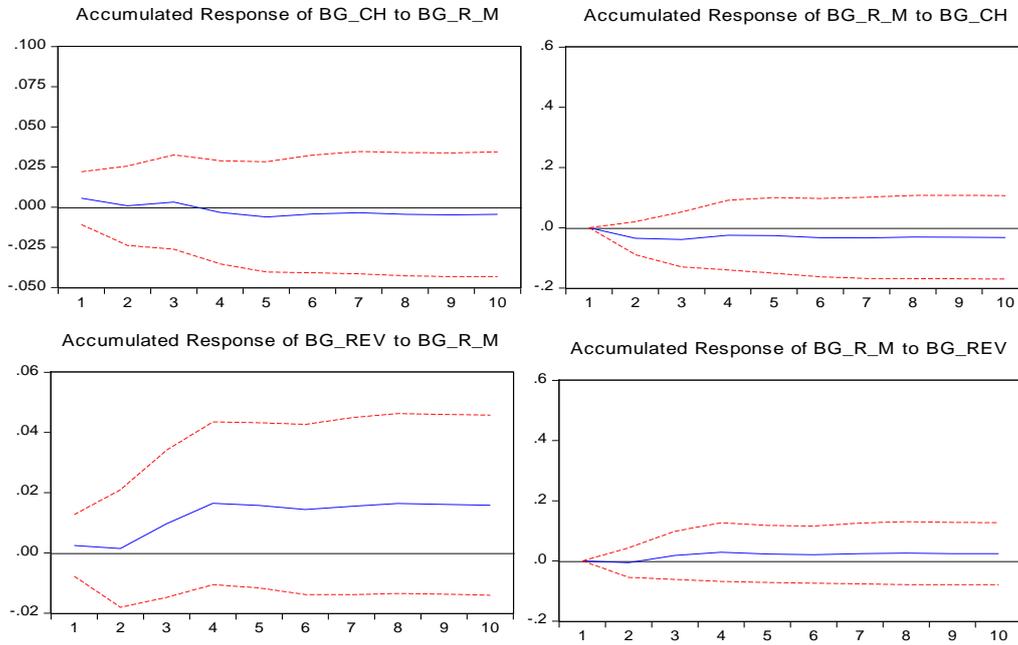*Accumulated Impulse Responses – Fiscal–Bulgaria*

Accumulated Response of BG_CH to BG_R_M

Accumulated Response of BG_R_M to BG_CH

Accumulated Response of BG_REV to BG_R_M

Accumulated Response of BG_R_M to BG_REV

Figure No.2
Accumulated Impulse Responses – Fiscal-Inclusive Model –Check Republic

Accumulated Response of CZ_CH to CZ_R_M

Accumulated Response of CZ_R_M to CZ_CH

Accumulated Response of CZ_REV to CZ_R_M

Accumulated Response of CZ_R_M to CZ_REV
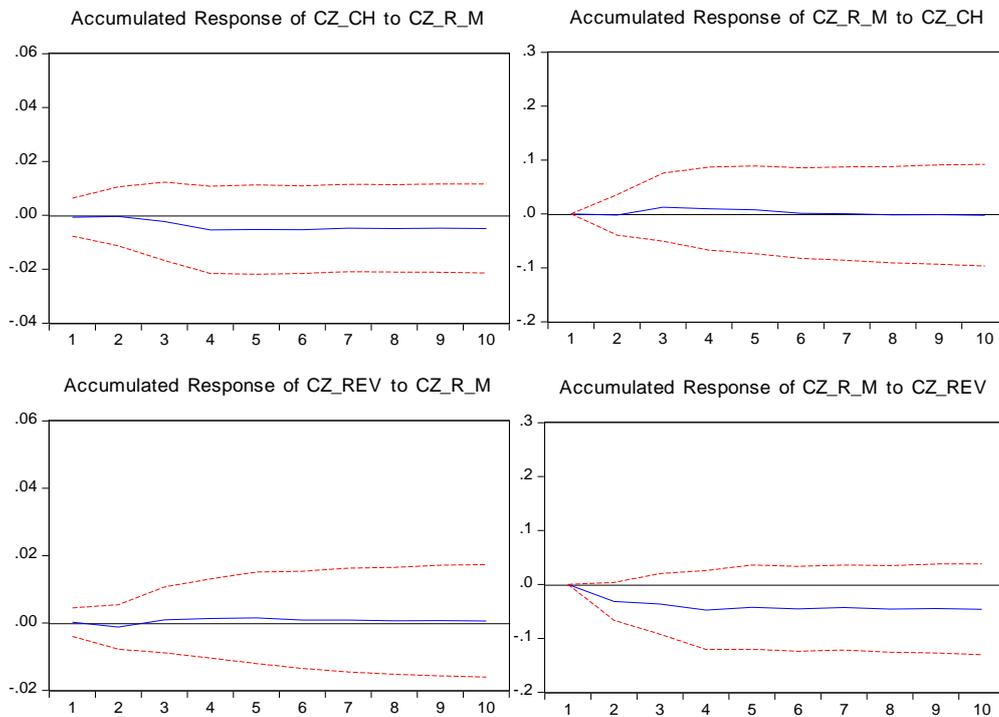
Figure No.3
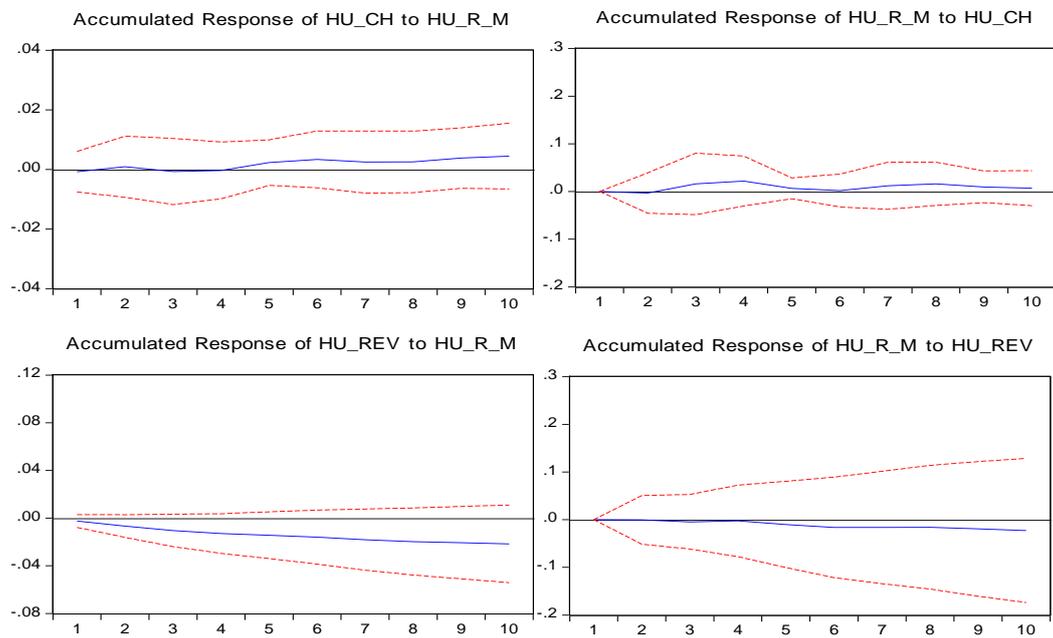*Accumulated Impulse Responses – Fiscal-Inclusive Model –Hungary*

Figure No.4
Accumulated Impulse Responses – Fiscal-Inclusive Model –Poland
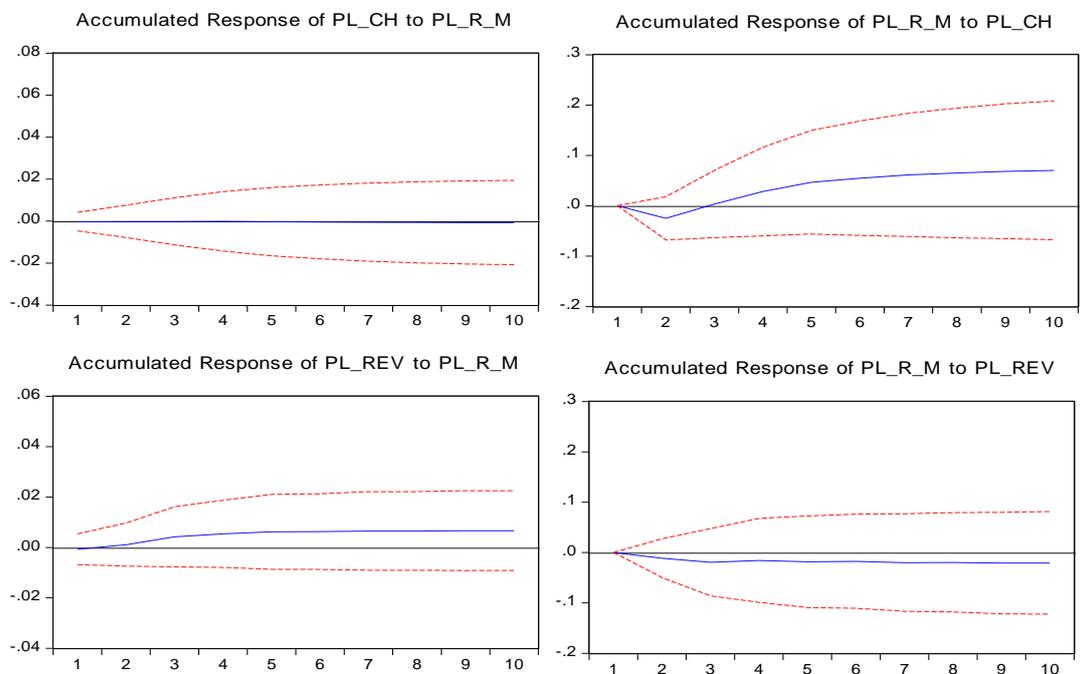
Figure No.5
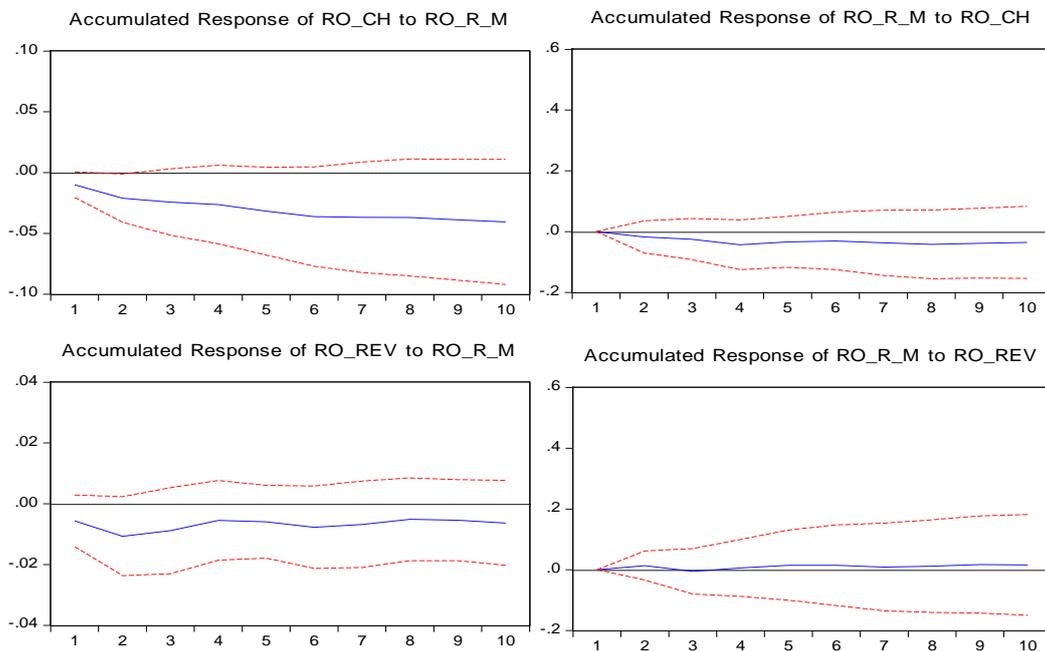*Accumulated Impulse Responses – Fiscal-Inclusive Model –Romania*

Figure No.6
Accumulated Impulse Responses – Fiscal-Inclusive Model –Slovakia