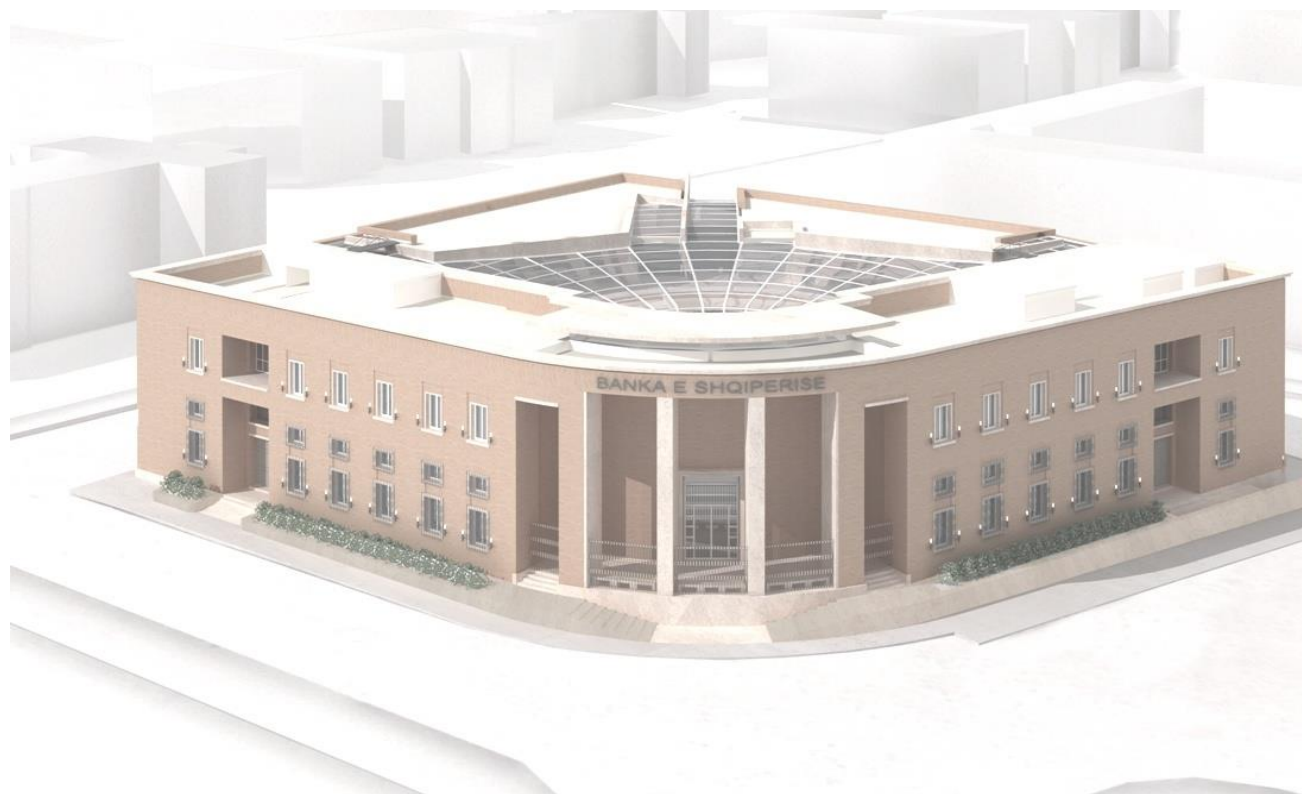




# AN EMPIRICAL INVESTIGATION OF THE EFFECTS OF FISCAL POLICY ON THE ALBANIAN ECONOMY

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The views expressed in the paper are those of the authors and do not necessarily represent the views of Bank of Albania.

# MOTIVATION

- The *continuous process of fiscal consolidation* over the recent years leads to the necessity to evaluate the effectiveness of fiscal policy (FP) and to propose in accordance to that, the appropriate monetary policies that would ensure a stable path toward sustainable economic growth in the country.
- Several studies published in the field of fiscal policy for the Albanian case: [Mançellari (2011), Shijaku and Gjokuta (2012), Shijaku (2012), Abazaj (2013), Gazidede (2013)]
- The *novelties* of this paper versus the other ones are the following:
  - Calculation of output elasticity through the disaggregated approach as suggested by OECD.
  - Investigation of fiscal policy effects w.r.t. private consumption and private investment.
  - Estimation of IRFs through a recently introduced methodology in the fiscal area, the LPM.
  - Comparison of fiscal multipliers high and low economic growth periods.

**Aim:** To characterize the dynamics of the behaviour of fiscal indicators in Albania and analysing their effects on the economic output.

**Research questions:**

- What is the overall impact of fiscal indicators on economic output?
- How effective are revenue versus spending instruments?
- Does current or capital spending have a larger impact?
- Which of GDP components is affected more by fiscal policy shocks?
- How do fiscal multipliers vary between periods with high and low economic growth?

**Methodology:** Application of a Structural Vector Autoregressive (SVAR) model for the identification of FP shocks and a Local Projection Method (LPM) for the computation of impulse response functions (IRFs).

# METHODS FOR THE IDENTIFICATION OF THE FP SHOCKS

- “*Narrative approach*” of Romer and Romer (1989)
- *Structural VAR* by Blanchard and Perotti (2002)
- *Sign restrictions* on the impulse responses by Mountford and Uhlig (2005)
- New Keynesian macroeconomic models, particularly *DSGE* models (Coenen et al., 2012)

# METHODOLOGY

- *Structural VAR* by Blanchard and Perotti (2002) for the identification of FP shocks [Perotti (2002), Mançellari (2011), Mitra and Poghosyan (2015), Hjelm and Stockhammar (2016)]
- *Local Projection Method* (LPM) for the computation of (IRFs) proposed by Jorda (2005) [Arizala et al. (2017), Jordà and Taylor (2016), Ramey and Zubairy (2014, 2016), Hjelm and Stockhammar (2016), Auerbach and Gorodnichenko (2012, 2013)]

## Advantages:

1. LPs may be less vulnerable to misspecification when the DGP is not a VAR
2. LPs can catch non-linearities in the model's dynamics even with a small number of lags.

# EMPIRICAL ANALYSIS – DATA DESCRIPTION

## ■ Variables:

- Government net primary expenditures ( $G_t$ ) = Government purchases of goods and services + Government spending for wages + Capital Expenditure - Government transfers - Interest payments
  - Net tax revenues ( $R_t$ ) = Fiscal Revenues – Transfers = VAT revenues + Direct taxes on individuals + Direct taxes on corporation + Excise Taxes + Customs duties + Social security taxes - Government transfers, where the later represent transfers to households and subsidies to firms
  - Real Gross Domestic Product ( $Y_t$ ), (2010=100)
  - Price level measured by the Consumer Price Index ( $P_t$ ), (2015=100)
  - Interest rates, represented by the 12-month Treasury Bills' rate ( $I_t$ )
- Quarterly data for the period 1998Q1-2018Q2 (82 periods)

## Sources of information:

- *Ministry of Finance and Economy*: fiscal indicators
- *INSTAT*: CPI; GDP
- *Bank of Albania*: 12-M TB

# ESTIMATION PROCEDURE

1. Test the stationarity properties of the data (ADF, PP)
2. The optimal lag length in the VAR representation of the model (AIC, SIC, BIC, HQ)
3. Estimation of the SVAR in levels [Stock and Watson (1990), de Castro and de Cos (2006), Jemec, Strojjan-Kastelec and Delakorda (2011)]
4. We perform several diagnostic tests:
  - homoscedasticity,
  - autocorrelation,
  - normality,
  - model stability.

# OUTPUT AND PRICE ELASTICITIES OF FISCAL VARIABLES

- The quarterly output elasticity of net tax revenues:

$$\alpha_y^r = \sum_{i=1}^n \alpha_{B_i}^{r_i} * \alpha_y^{B_i} * \frac{T_i}{T} = 1.48$$

- The price elasticity of net tax revenue  $\alpha_p^r = -1$ , since the purchasing power decreases at the exact same amount that prices increase.
- The price elasticity of government spending  $\alpha_y^g = -0.5$ , as some of this spending might be fixed, as they are contract-based, meanwhile others might be effectively indexed to the price level within the quarter.
- The interest rate elasticity of both net taxes and government spending are set to 0:  $\alpha_i^g = \alpha_i^r = 0$ .
- Assuming that the government makes spending decisions before tax decisions  $\beta_r^g = 0$ .

# IDENTIFICATION OF SVAR MODEL

Defining the vector of structural shocks as  $V_t = [v_t^g, v_t^r, v_t^y, v_t^p, v_t^i]^T$ ,  $U_t$  can be written as a linear combination of structural shocks  $V_t$  as follows:

$$AU_t = BV_t \quad (1)$$

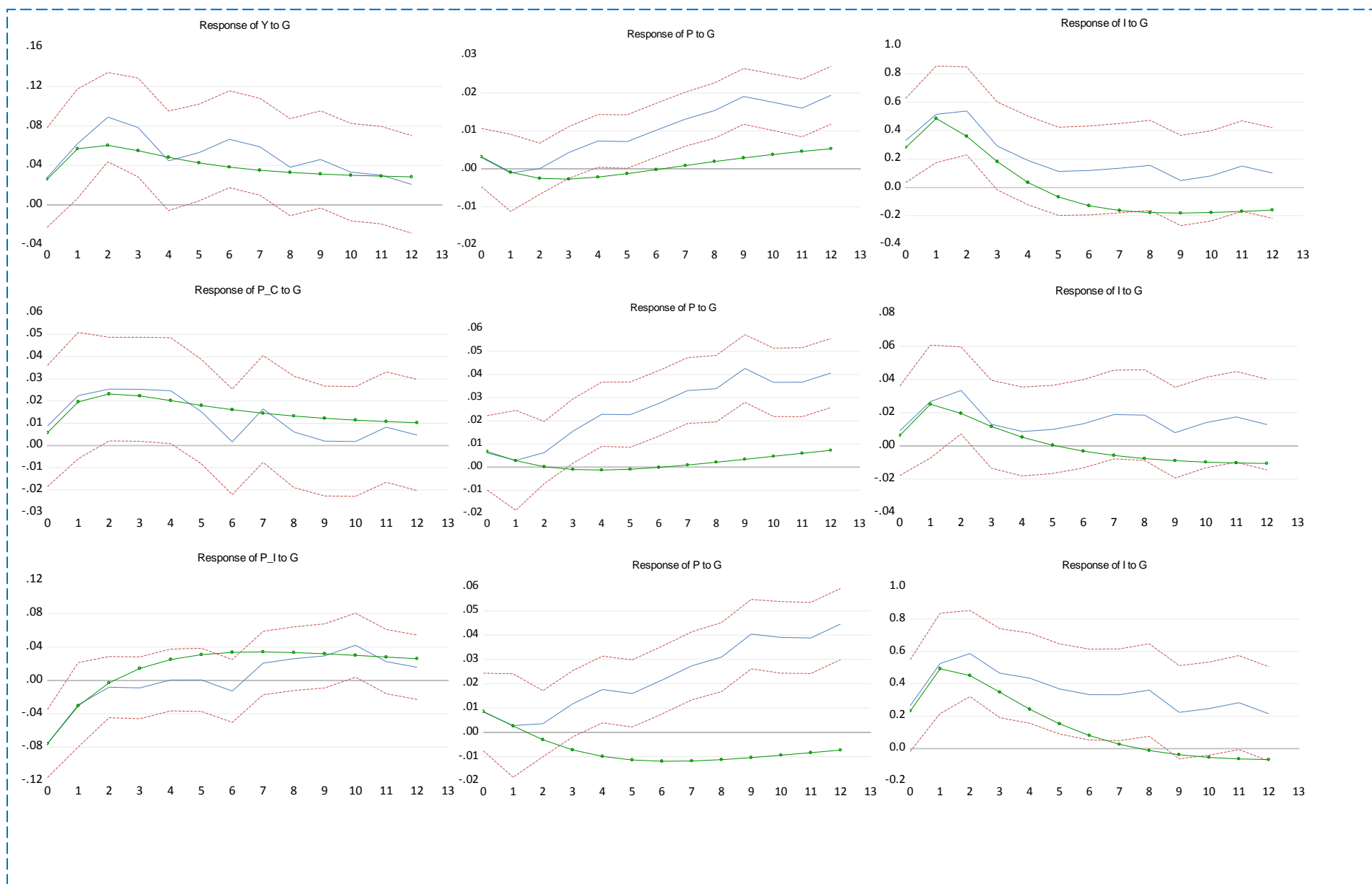
where  $A$  and  $B$  are  $n \times n$  matrices describing the relations between the reduced form residuals and the structural shocks.

The matrix representation of (1) is:

$$\begin{bmatrix} 1 & 0 & 0 & 0.5 & 0 \\ -\alpha_g^r & 1 & -1.48 & 1 & 0 \\ -\alpha_g^y & -\alpha_r^y & 1 & 0 & 0 \\ -\alpha_g^p & -\alpha_r^p & -\alpha_y^p & 1 & 0 \\ -\alpha_g^i & -\alpha_r^i & -\alpha_y^i & -\alpha_p^i & 1 \end{bmatrix} \begin{bmatrix} u_t^g \\ u_t^r \\ u_t^y \\ u_t^p \\ u_t^i \end{bmatrix} = \begin{bmatrix} \beta_g^g & 0 & 0 & 0 & 0 \\ \beta_g^r & \beta_r^r & 0 & 0 & 0 \\ \beta_g^y & 0 & \beta_y^y & 0 & 0 \\ 0 & 0 & 0 & \beta_p^p & 0 \\ 0 & 0 & 0 & 0 & \beta_i^i \end{bmatrix} \begin{bmatrix} v_t^g \\ v_t^r \\ v_t^y \\ v_t^p \\ v_t^i \end{bmatrix} \quad (2)$$

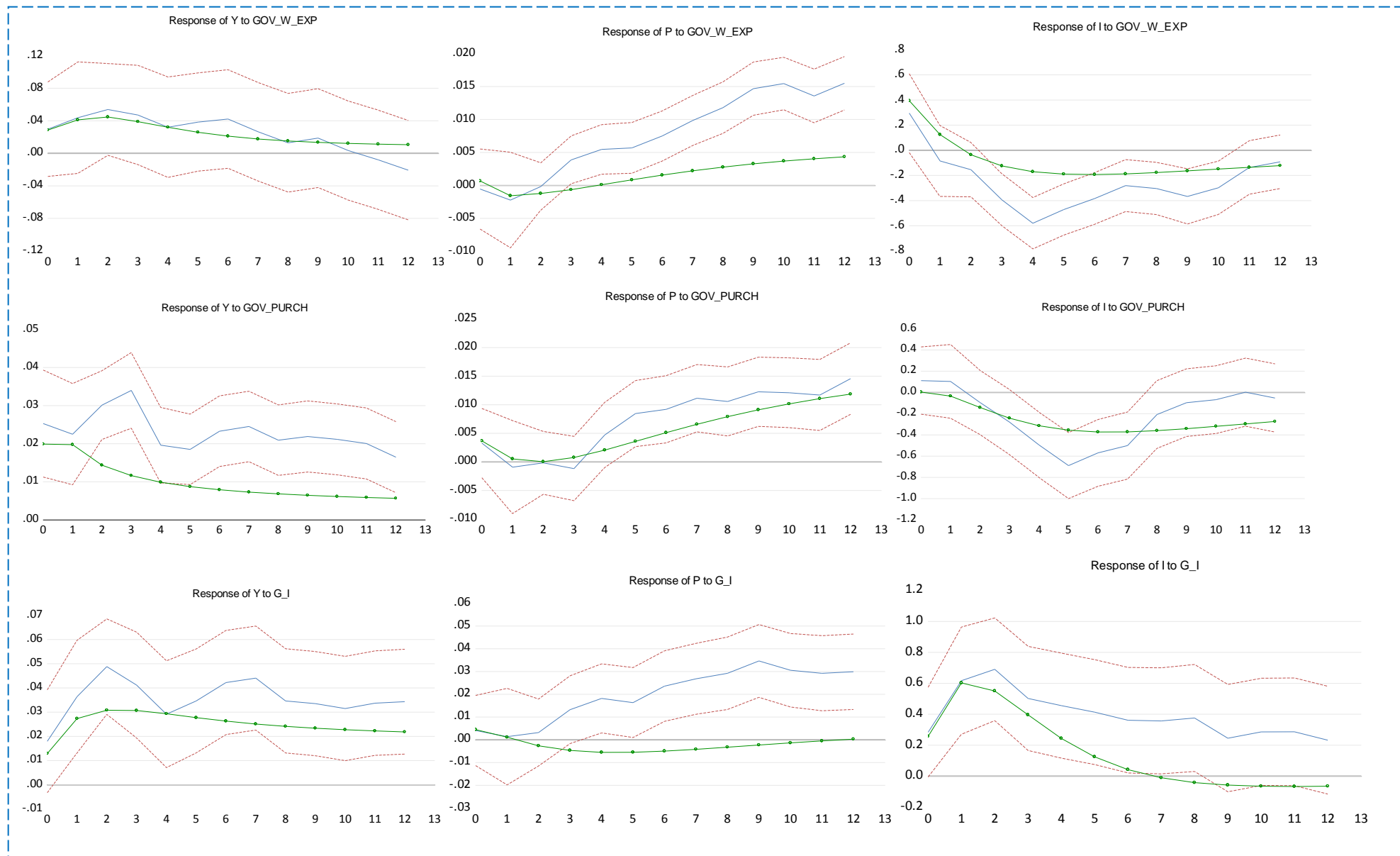
# ESTIMATION RESULTS – GOVERNMENT SPENDING (GS) EFFECTS

Figure 1. Effects of a 1% structural spending shock on several economic indicators



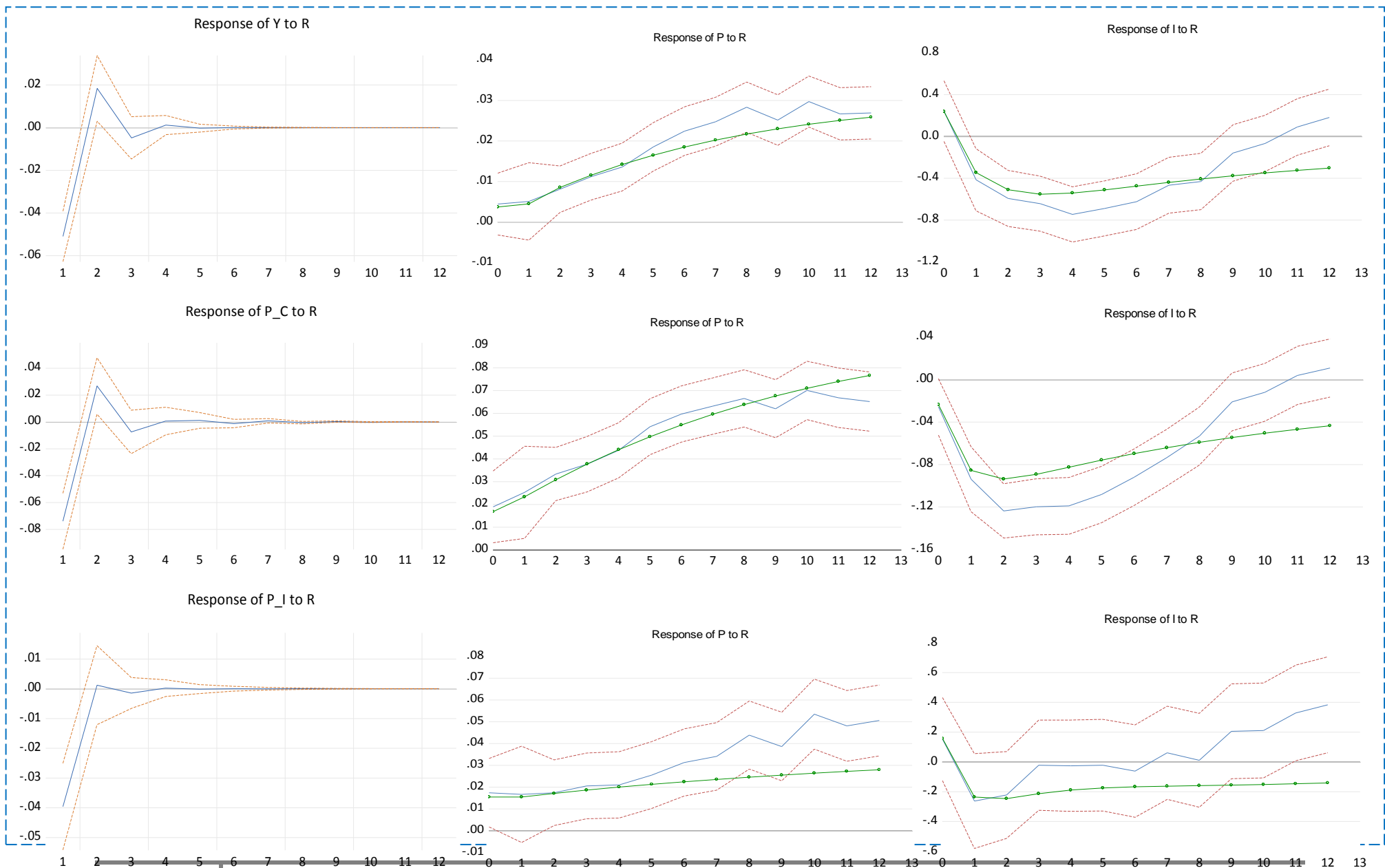
# ESTIMATION RESULTS - GS CATEGORIES EFFECTS

Figure 2. Effects of a 1% shock on different government spending categories



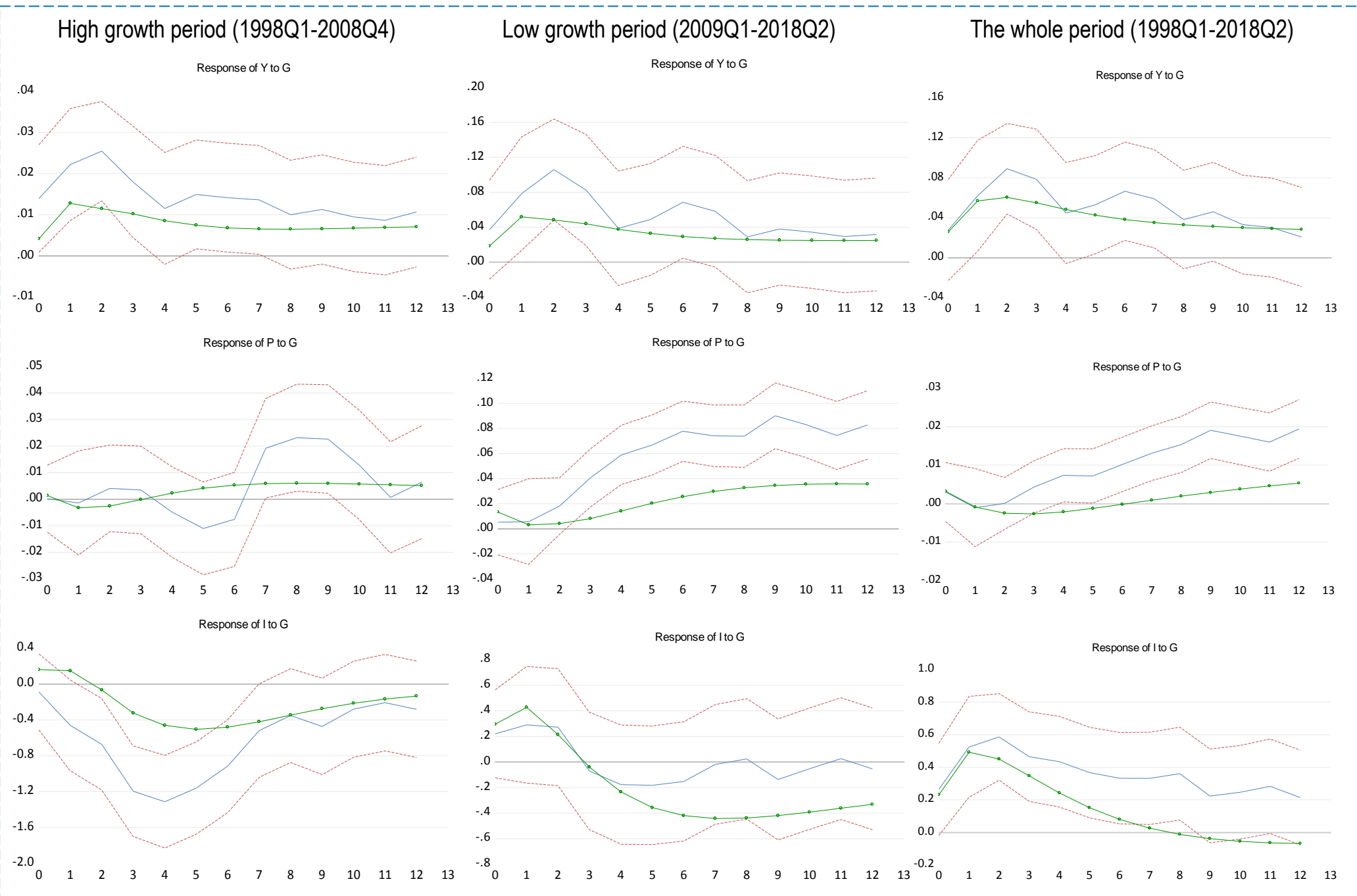
# ESTIMATION RESULTS – TAX REVENUE EFFECTS

Figure 3. Effects of a 1% tax revenue shock



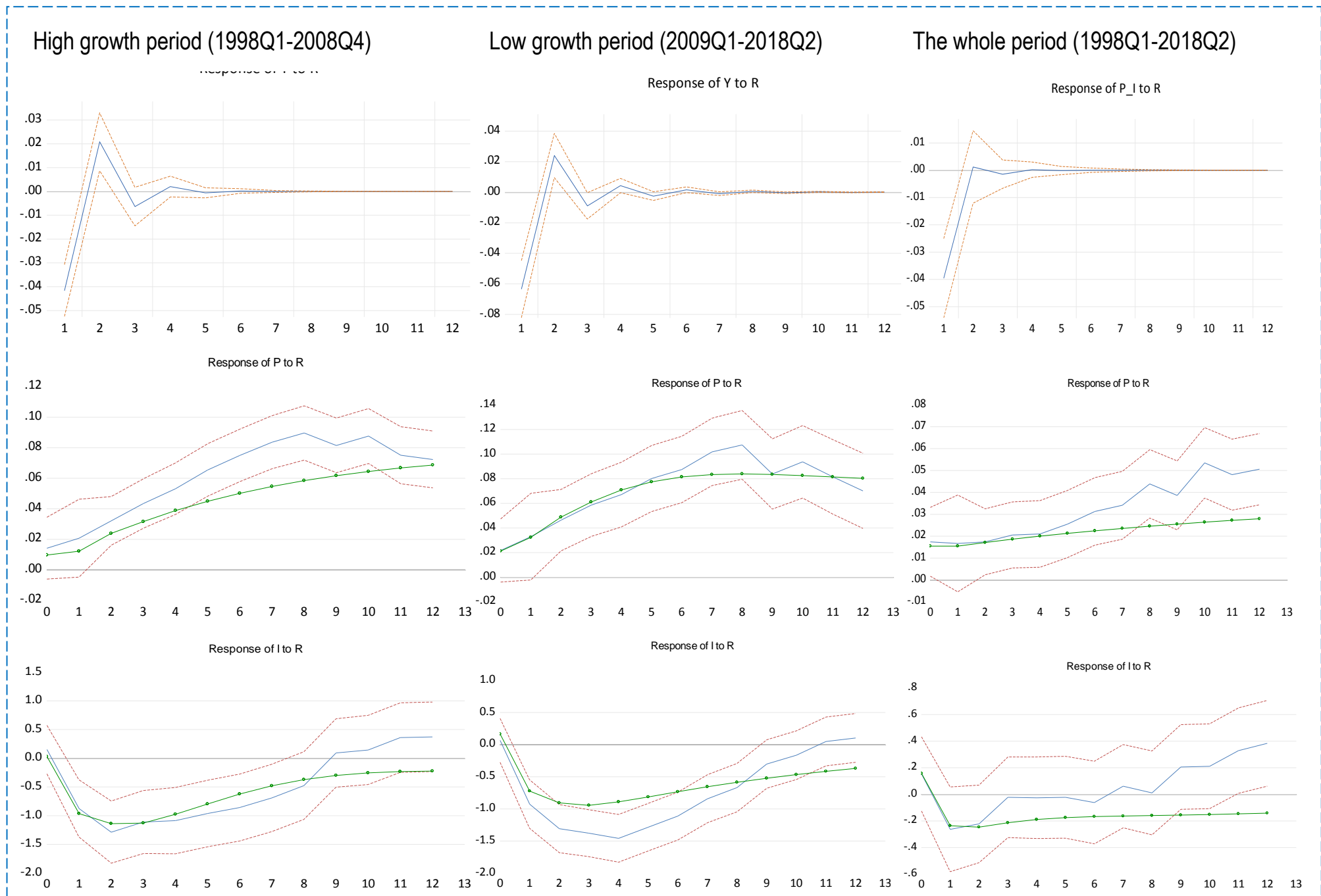
# ESTIMATION RESULTS – HIGH & LOW GROWTH PERIODS

Figure 4. Effects of a 1% structural spending shock on several economic indicators



# ESTIMATION RESULTS – HIGH & LOW GROWTH PERIODS

Figure 5. Effects of a 1% structural tax revenue shock on several economic indicators



## CONCLUDING REMARKS

- The size and the sign of a fiscal multiplier is country-, time-, methodology- and economic conditions-dependent [Caldara and Kamps (2008) and Chahrour et al. (2012)].
- Output and private consumption reacts positively to a government spending shock and negatively to a tax revenue shock, while investment reaction to spending shock is insignificant.
- The effects of government spending shocks are transmitted to prices after 1 year, while those of tax shocks are transmitted much faster.
- In the medium-term, the revenue multiplier becomes insignificant and the spending multiplier continues to remain significant.
- Capital spending and government purchases have a similar effect on GDP but the capital multiplier remains significant for longer. Consequently, it may be necessary to rely more on wage spending cuts over other types of consolidation measures even though multiplier estimates suggest a more diverse combination of measures.

# POLICY IMPLICATIONS & FUTURE RESEARCH

- A fiscal adjustment strategy based on a combination of expenditure and tax measures may have a lower short-run cost compared with purely expenditure-based consolidation.
- Medium-term policies could minimize the adverse consequences of consolidation on growth by offsetting some current spending cuts with increased capital spending.
- Given the challenges facing the Albanian economy, it is important that policymakers apply these results in conjunction with broader considerations such as public debt sustainability, investor confidence, credibility of government policies, and public spending efficiency.

## FUTURE RESEARCH:

- Including additional explanatory variables to capture country characteristics, such as: openness to trade, public debt, money supply, the quality of government (International Country Risk Guide).
- Investigate the effects of different taxes (direct and indirect)
- Application of a sign restriction approach Mountford and Uhlig (2004) that handles the problem of anticipated fiscal policy.

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# THANK YOU!

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**Table 1** Exogenous sub-elasticities with respect to real GDP and share of tax item in total taxes (baseline model).

	Elasticity of budgetary item to tax base	Elasticity of Tax base to real GDP	Elasticity of budgetary item to real GDP	Avg. Weight (Share in tax revenues)
	$\alpha_{B_i}^{r_i}$	$\alpha_y^{B_i}$	$\alpha_y^{r_i}$	$\frac{T_i}{T}$
VAT	1,443	0,947	1,367	0,455
Profit tax			2,250	0,096
Excise	2,080	0,947	1,970	0,131
Personal Income Tax	2,104	1,329	2,796	0,083
Custom duties	-1,033	1,318	-1,361	0,075
Social Security Tax	0,863	1,329	1,147	0,218
Health Tax	1,445	1,329	1,920	0,025
Transfers (unemployment and economic assistance)			0,800	0,082

Source: Author's calculations.

**Table 2** Proxies for tax bases.

Tax category	Tax Base
Value Added Tax	Private Consumption
Profit Tax	Corporate Profits
Personal Income Tax	Wages
Excise	Private Consumption
Custom Duties	Imports
Health and Insurance	Wages

Source: INSTAT, Ministry of Finance and author's calculations.