

FISCAL POLICY AND ECONOMIC GROWTH IN BULGARIA

Kristina Karagyozova-Markova, Georgi Deyanov, Viktor Iliev

NBRM 2ND RESEARCH CONFERENCE, SKOPJE

APRIL 2013

BULGARIAN NATIONAL BANK



INTRODUCTION

- The discussion on the macroeconomic effects of fiscal policy remains a highly controversial one.
- No theoretical consensus on the size and even the sign of the fiscal multipliers.
- Broad consensus in the academic literature about the main determinants of their size.
- Fiscal multipliers are found in many different forms in the literature which makes interpretation and comparison of results from different studies difficult.
- Their size varies over time, particularly relevant for countries that experience structural changes.

DEFINITION OF FISCAL MULTIPLIERS

In this study, the fiscal multiplier is measured by the ratio of the change in GDP or other measure of output to the exogenous change in the fiscal variable that have caused the effect on output.

- Time frame of the assessment:

- Impact multiplier: $\left(\equiv \frac{\Delta Y(t)}{\Delta G(t)} \right)$
- Cumulative multiplier: $\left(\equiv \frac{\sum_{i=0}^N \Delta Y(t+j)}{\sum_{i=0}^N \Delta G(t+j)} \right)$

- Fiscal instrument in consideration:

- Direct effect on aggregate demand:
 - Δ Government consumption
 - Δ Government investment
- Indirect effect on aggregate demand:
 - Δ Net taxes (*direct taxes, indirect taxes, total taxes, etc.*)
 - Δ Lump sum transfers
 - Δ in other tax and expenditure aggregates ...

DETERMINANTS OF FISCAL MULTIPLIERS SIZE

Usually, fiscal multipliers are larger when:

- The “leakages” of the fiscal stimulus are limited
- The monetary policy is accommodative
- The fiscal stance of the economy remains sustainable after the fiscal stimulus.

ASSESSMENT APPROACHES OF FISCAL MULTIPLIERS

- Empirical estimates based on VAR models¹
 - Identification of the presumably exogenous fiscal shocks
- Structural model-based evaluations²
 - Allow for evaluations based on permanent shocks
 - Largely dependent on the theoretical construction of the model
- Case studies
 - Based on well documented changes in tax policy or discretionary government spending³
- Micro data empirical studies

The most widely applied approaches are based on VAR models and structural model-based evaluations (e.g. DSGE models)

1. See Boussard et al. (2012) for summary table of results from VAR-based expenditure and net taxes multipliers in US, Germany, France, Italy, Spain, UK, Portugal and the Euro area

2. Spilimbergo et al., 2009; Perrotti, 2007; Christiano et al., 2010

3. Romer and Romer (2008)

VAR MODELS IDENTIFICATION SCHEMES

- Main approaches for identification applied in VAR-based studies
 - Short-run restrictions
 - Recursive Cholesky decomposition (Sims, 1980 and Fatas and Mihov, 2001)
 - Structural VAR approach (Blanchard and Perotti, 2002)
 - Sign restrictions (Uhlig, 2005)
 - Long-run restrictions (Blanchard and Quah, 1998)
 - Examples of typical assumptions are that government spending does not permanently effect tax revenues and vice versa, real output does not have a permanent effect on government expenditures and inflation, etc.
 - Event-study approach (Ramey and Shapiro, 1998)

SUMMARY OF EMPIRICAL RESULTS FOR FISCAL MULTIPLIERS BASED ON VAR MODELS

- Spending multipliers
 - For large closed economies – in the range of 1-1.5
 - For medium-sized economies – in the range of 0.5-1
 - For small open economies – below 0.5
- Tax multipliers are generally twice lower
- Openness and the monetary policy regime affects the size of the fiscal multipliers

ASSESSING THE IMPACT OF FISCAL POLICY ON REAL ECONOMIC ACTIVITY IN BULGARIA

- Econometric methodology – we compare the results from:
 - Linear VAR models with two different identification schemes
 - Recursive approach (based on Cholesky decomposition)
 - Blanchard and Perotti (2002) approach
 - Time-varying parameters Bayesian VAR with stochastic volatility
- We use accrual fiscal data for comparison of results with EU countries

VAR-BASED RESULTS: THE RECURSIVE APPROACH (1)

- The baseline VAR model includes three endogenous variables in real terms: government spending (g), GDP (y) and net taxes (τ)
- We also include a constant, a linear time trend and the log-transformed foreign demand (fd) for Bulgarian exports as an exogenous variable
- The ordering of the variables in the Cholesky decomposition has strong economic implications
- The model is estimated for the period 1999-2011
- All variables are deflated with GDP deflator and seasonally adjusted with TRAMOSEATS

VAR-BASED RESULTS: THE BLANCHARD AND PEROTTI APPROACH (2)

- Structural VAR model proposed by Blanchard and Perotti (2002) and extended in Perotti (2005, 2007)
- Estimates for the budgetary output elasticities
- Model estimated with net taxes, government spending and output, following the aggregates definition from Blanchard and Perotti (2002)

SUMMARY OF VAR-BASED RESULTS

- Tax and spending multipliers in the two linear VAR models

Cumulative output multipliers				
	Quarters			
Recursive VAR model:	1	4	8	12
Government spending	0.03	0.17	0.48	0.70
Net taxes	0.00	0.91	1.48	1.02
SVAR model with BP identification¹:	1	4	8	12
Government spending	0.01	0.41	0.87	0.92
Net taxes	-0.30*	0.19	0.43	-0.21

*denotes significance at the 5% level.

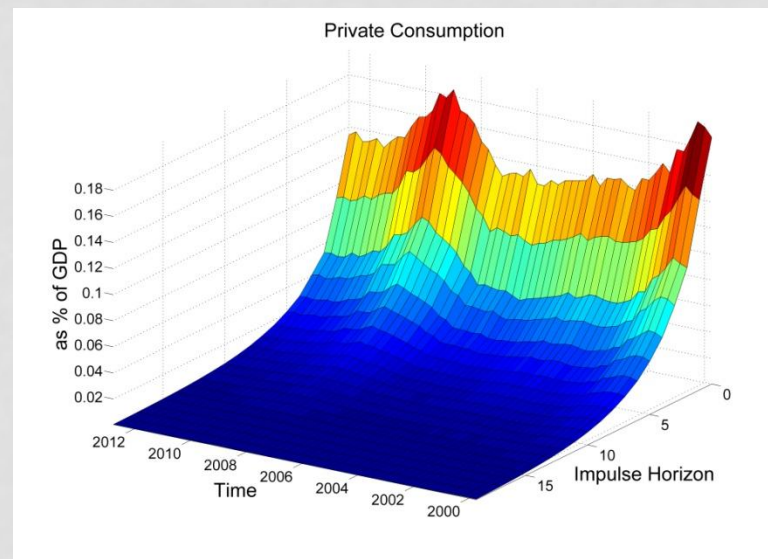
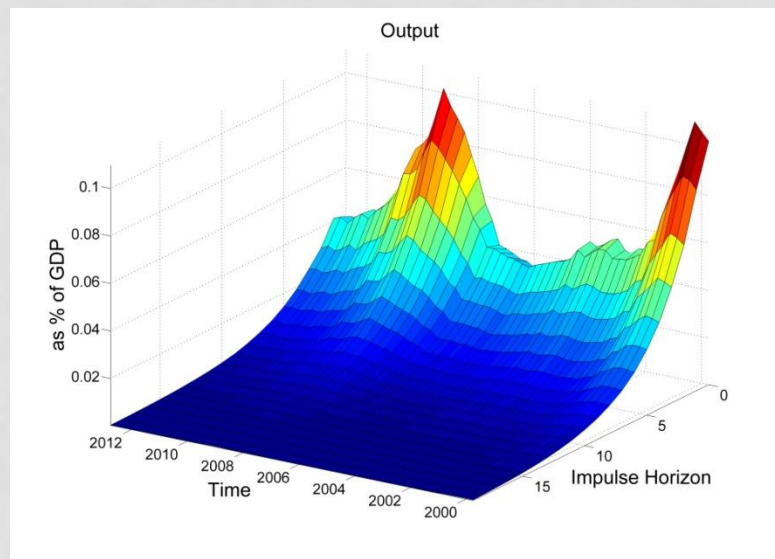
¹ Blanchard and Perotti structural identification

PROBLEMS WITH VAR-BASED RESULTS

- Most studies estimate linear constant effects of fiscal policy on economic activity
- Some VAR studies find that the size of fiscal multipliers is often highly dependent on the underlying state of the economy
- In most cases fiscal multipliers are larger in downturns than in expansions
- Structural changes in the economy, particularly relevant for the catching-up economies of the EU, and major tax and spending reforms may also influence the magnitude of fiscal policy effects over time
- Sources of non-linear effects of fiscal policy
- Impact of fiscal policy on the formation of expectations in the private sector

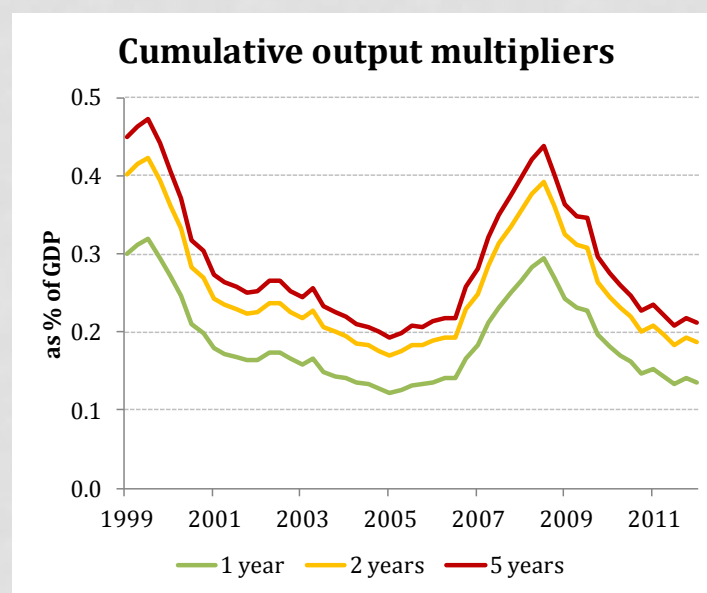
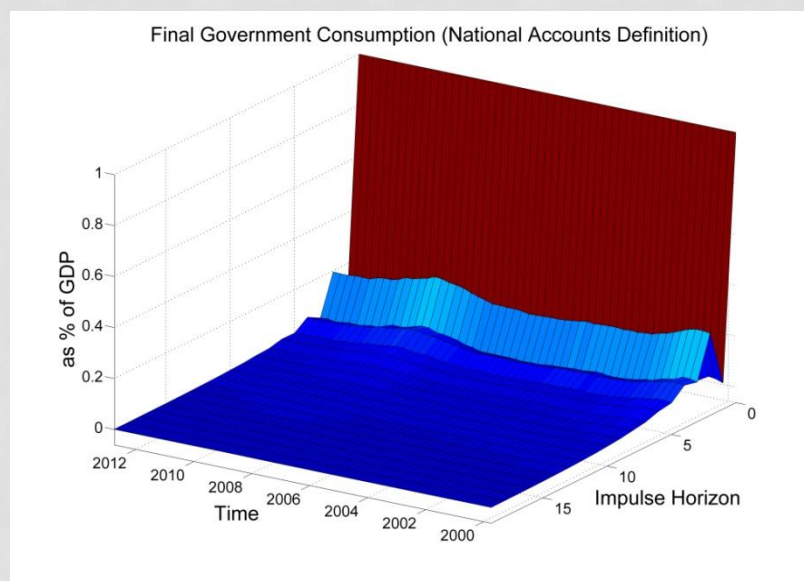
RESULTS FROM TIME-VARYING PARAMETERS BAYESIAN VAR WITH STOCHASTIC VOLATILITY (1)

Time varying impulse responses



RESULTS FROM TIME-VARYING PARAMETERS BAYESIAN VAR WITH STOCHASTIC VOLATILITY (2)

Time varying impulse responses



CONCLUSIONS

- The results of the linear VAR models indicate that the effectiveness of fiscal policy in stimulating economic activity in Bulgaria over the period 1999-2011 is generally low as first-year spending multipliers do not exceed 0.4
- The results regarding the tax multipliers are subject to a lot of uncertainty, but the overall effect of tax measures on economic activity appears to be small and short-lived
- These findings are in line with most of the studies on the peripheral EU Member State and support the general view that fiscal multipliers are usually small in small, open economies
- TVP-VAR model reveals important information regarding the variations of the government consumption multiplier over time
- Even though further research is needed in this area, the underlying state of the economy appears to be an important determinant of the nonlinear effects of fiscal policy on economic growth in Bulgaria