

Tracking Monetary-Fiscal Interactions Across Time and Space

Policy Nexus and the Global Environment: A New Consensus Emerging
from the Crisis?

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April 26, 2013, Skopje

Outline of the Presentation

- General introduction to monetary-fiscal interactions
- 2 real-life examples
- Our paper: model, identification and empirical findings
- Conclusions (GFC, monetary union, central bank independence)

We focus on the case of independent central banks i.e. there is no direct influence of fiscal authority on the behavior of monetary authority.

But MF interactions realized indirectly through affecting the same macro variables:

- F->M: crowding out of private credit, exchange rate risk related to foreign financing of government debt, indirect taxes affecting inflation,...
- M->F: government's debt-servicing costs, government revenues affected by the performance of the economy,...

The key question today:

In the situation of high government debt/deficits and their pessimistic outlook, can the fiscal policy affect conduct of the independent monetary policy?

Some empirical evidence is provided by our paper.

Two Real-life Examples

Two examples of how the monetary policy can become ineffective because of the fiscal situation through expectations related to:

- Default risk on government debt (Brazil, 2002)
- Higher inflation lowering the real value of debt (Italy, 1992-98)

Both cases: independent central bank, high level of government debt

Channels:

- higher real interest rate \rightarrow less attractive g debt \rightarrow real depreciation \rightarrow higher inflation
- fiscal news affected public expectations about the ability of Italy enter the EMU \rightarrow swings in exchange rate and inflation

Resolution: fiscal reforms/announcement of joining the EMU

Lessons to be Learned

- The two examples demonstrate that the influence of FP on MP can be substantial (high debt, expectations related to the way how to reduce the government debt).
- Sargent and Wallace (1981): a truly independent monetary policy is impossible if fiscal deficits create expectations of future government interference in monetary affairs.
- So, how to steer the expectations? The two examples suggest that the FP should commit to a target/policy rule.
- And monetary policy?

Point of our paper: **cb's explicit commitment to a numerical target can in addition discipline the fiscal policy (in the long-run) and thus expectations about the fiscal policy.**

- Joint work with J. Libich (La Trobe University, Melbourne) and P. Stehlik (University of West Bohemia, Pilsen)
- Two implied conjectures tested in the paper (based on the game theory - Libich (2011) and Libich et al. (2012))

(1) A central bank with a numerical target for average inflation is less prone to accommodate a debt-financed government spending shock than a central bank without such an explicit long-term monetary commitment.

(2) The change in the response of a more strongly committed central bank alters the incentives of governments by reducing their payoff from debt-financed spending, and therefore leads to an improvement in the fiscal balance.

- In summary, we are interested in both directions of the policy interactions.

HOW TO MODEL THE MONETARY-FISCAL INTERACTIONS?

- DSGE models, VARs:

1) Phenomena of interest not necessarily of a business cycle frequency.
2) Macro models **assumes** regime M (given MP and private behavior, FP stabilizes real debt).

- Expected vs. unexpected events and identification of F shocks
- Gradual changes in economy, policies,....(MS VAR?)
- Changes in monetary and fiscal policies are not necessarily synchronized (subsample analysis?)

Model: Time-varying Parameter VAR

- Very flexible approach but the set of parameters can be very large.
- Large parameter set accounted for using Bayesian estimation.
- Introduced by Primiceri (2005) and Cogley and Sargent (2005).
- Originally used to analyse the monetary policy transmission (e.g. Canova et al., 2007, Benati and Surico, 2008). So far used also for the analysis of financial issues (Eickmeier et al., 2011), exchange rate dynamics (Mumtaz and Sunder-Plassmann, 2010), oil price shocks transmission (e.g. Baumeister and Peersman, 2008) and yield curve dynamics (Bianchi et al., 2009).
- For fiscal policy analysis used in Kirchner et al. (2010) and Pereira and Lopes (2010).

Model: Time-varying Parameter VAR II

$$y_t = X_t \beta_t + A_t^{-1} \Sigma_t \varepsilon_t$$

A_t is a lower triangular matrix of contemporaneous relations:

$$A_t = \begin{bmatrix} 1 & 0 & \cdots & 0 \\ \alpha_{21,t} & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ \alpha_{M1,t} & \cdots & \alpha_{M,M-1,t} & 1 \end{bmatrix}$$

Σ_t is a diagonal matrix of standard deviations

$$\Sigma_t = \begin{bmatrix} \sigma_{1,t} & 0 & \cdots & 0 \\ 0 & \ddots & \ddots & \vdots \\ \vdots & \ddots & \ddots & 0 \\ 0 & \cdots & 0 & \sigma_{M,t} \end{bmatrix}$$

Parameters follow (geometric) random walk.

- Inflation targeters: Australia, Canada, UK
- Non-targeters: Japan, Switzerland, US
- Time span: 1980Q1-2008Q2 (excluding GFC)
- Endogenous variables: Government spending, output, private consumption, short-term interest rate, government debt (disaggregated)
- Variables in real per capita terms (except the interest rate).
- Levels used (stationarity issues).
- What interest rate to use?

- Debt-financed government spending shock is identified.
- We focus on this specific shock; different fiscal shocks can differ in their effects.
- Identification is a combination of sign, contemporaneous and magnitude restrictions.
- Fiscal TVPVARs from Kirchner et al. (2010) and Pereira and Lopes (2010) use identification based on the assumption of lagged reaction of some endogenous variables to others.
- **No strict timing assumptions on moves of monetary and fiscal authorities are imposed** - game theory suggests that this assumption is crucial.

Identification - Sign Restrictions

	Output		Private cons.		Interest rate		Gov. spending		Gov. debt	
lags	0	1,2	0	1+	0	1+	0	1-4	0	1-4
Debt-financed spending sh.	+	+	none	none	none	none	+	+	+	+
MP shock	0	-	0	-	+	+	0	+/-	+	+
Generic bc shock	+/-	+/-	+/-	+/-	+/-	+/-	0	+/-	-	-

- Two issues:
 - 1) identify a sufficient number of shocks (Wouters, 2005)
 - 2) be sure that the identified shock is not confused with other types of shocks reflected by the endogenous variables
- No restriction on the interest rate and private consumption.
- Pappa (2009) shows that standard structural models satisfy such conditions (on impact).

Identification - Contemporaneous and Magnitude Restrictions

- **Contemporaneous restrictions:**

Government spending contemporaneously not affected by the business cycle.

Reminiscent of the standard identification approach (Fatas and Mihov, 2001).

Implemented using a sub-space of space of Givens rotations.

- **Magnitude restrictions:**

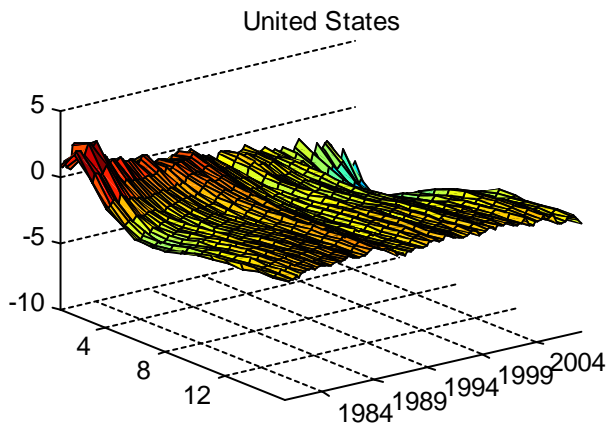
Government budget constraint:

$$\begin{aligned} g_cons_and_invest_t + transfers_t + interest_payments_t &= \\ &= taxes_t + (debt_t - debt_{t-1}) \end{aligned}$$

Magnitude restriction: debt does not exceed spending (in four quarters).

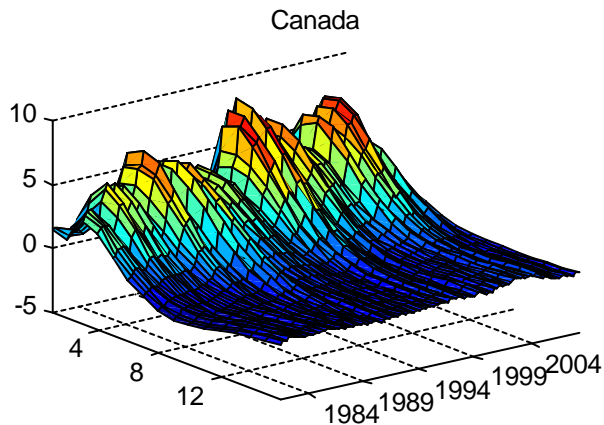
Results - Conjecture 1 (Non-targeters: U.S.)

IRF of the Interest Rate to a Debt-financed Government Spending Shock



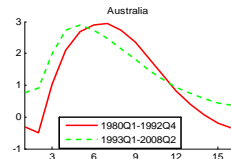
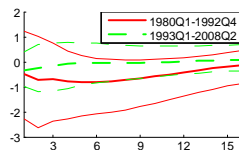
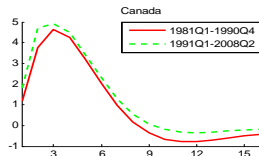
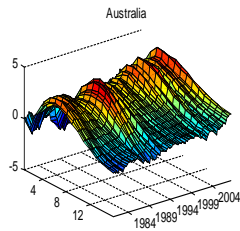
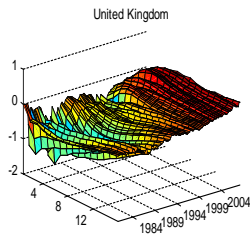
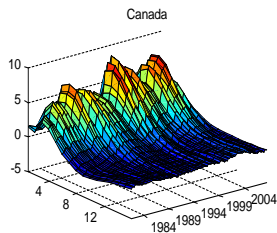
Results - Conjecture 1 (Targeters: Canada)

IRF of the Interest Rate to a Debt-financed Government Spending Shock



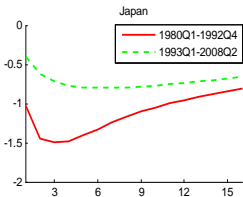
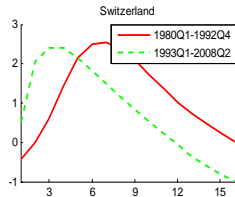
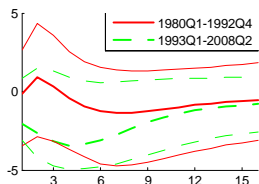
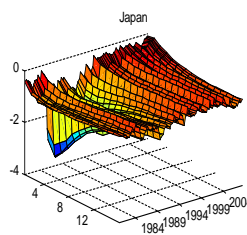
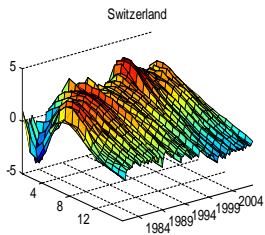
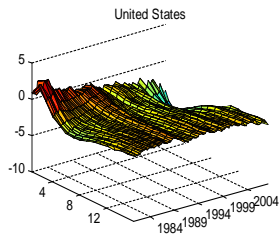
Results - Conjecture 1

IRF of the Interest Rate to a Debt-financed Government Spending Shock - TARGETERS



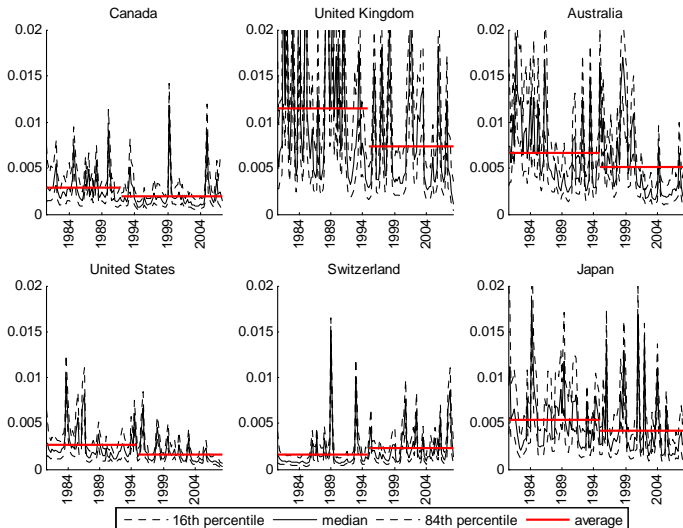
Results - Conjecture 1

Impulse Response Function of the Interest Rate to a Debt-financed Government Spending Shock - NON-TARGETERS



Results - Conjecture 2

Estimated Standard Deviations of Reduced Form Residuals for Government Spending



- Contribution of the paper:
 - Methodological: extends fiscal TVP-VARs for the identification based on sign, contemporaneous and magnitude restrictions.
 - Positive: provides empirical evidence on monetary policy-fiscal policy interaction for selected developed countries.
 - Normative: discusses the theoretical background behind the modeling of the interaction.
- Policy implications: **Commit as explicitly as possible to a long-term inflation target.** Remember FOMC subscribed recently to 2% target for inflation.

- Some analogies could be drawn between current situation and the two examples mentioned: Are we heading the period of fiscal dominance? (consequences for macro modeling)
- What about monetary union? Several fiscal authorities and a monetary authority. Free rider problem.
- The cb independence questioned after the GFC.