

# The Effects of Fiscal Policy: Evidence from Italy

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# Motivations

- ▶ The assessment of the effects of fiscal policies regained popularity since the beginning of the Great Recession (e.g., zero lower bound, self-defeating austerity, demand-driven secular stagnation)
- ▶ The dependence of fiscal multipliers on time/state of the economy has been advocated (e.g., monetary policy regime, financial turmoil, economic downturns, composition of fiscal stimulus, asymmetric effects of expansions vis-à-vis consolidations)
- ▶ Nonlinearities are substantial and deserve to be studied with appropriate modelling tools (i.e., mainstream DSGE models appear to be essentially flawed (also) in this respect)

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# Aims

- ▶ Characterizing Italian fiscal policies in terms of degree of (counter)-cyclicality and effects of government spending shocks both over time and as the state of the economy changes
- ▶ Embedding the most relevant features in a properly designed macroeconomic model able to catch the most relevant sources of nonlinear behavior
- ▶ Run counter-factual simulations so as to track the dynamics of fiscal multipliers as the power of the different transmission channels changes

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## So far.. so good?

- ▶ We start our journey by considering government consumption expenditures as they come from National Accounts
- ▶ We look at cross-correlation coefficients between government spending and GDP (bandpass filtered series) in different time periods
- ▶ We estimate a wide set of (linear, time varying, threshold) vector autoregressions (VARs) so as to catch the dynamics of the effects of fiscal policies over time

## Results in a nutshell

- ▶ Italian government consumption expenditures do display a moderate counter-cyclicality over the post WWII period. However, the decade between the late 90s and the crisis (excluded) is characterized by (moderately) pro-cyclical fiscal policy
- ▶ This coincides with lower government spending multipliers as showed by the performed VAR analysis and the ensuing impulse response functions.
- ▶ Strong evidence in favor of state dependence of government spending multipliers. In particular: **stronger multipliers in low growth regimes.**



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# Our approach

- ▶ BandPass filter and cross-correlations
- ▶ Linear and time varying VAR analysis
- ▶ State dependent (Threshold) VAR analysis

# BP filter and cross-correlations

- ▶ We do apply a Christiano-Fitzgerald filter so as to extract the business cycle component from both government public expenditures and GDP (from 6 up to 32 quarters).
- ▶ We do apply the filter to the variables in yearly growth rates (i.e.,  $\ln(y_t) - \ln(y_{t-4})$ )
- ▶ We then look at cross-correlation coefficients at different leads/lags

# Linear vector autoregressions

- ▶ A VAR model is...

$$y_t = c + \sum_{i=1}^p A_i y_{t-i} + \varepsilon_t$$

- ▶ **Estimation.** The model can be estimated relying on a wide range of econometric techniques (i.e., OLS, maximum likelihood, bayesian approach)
- ▶ **Identification issues.** Once the model has been estimated you need to recover the (contemporaneous) structural linkages among the variables within the system (Choleski or other decompositions; long-run restrictions; sign restrictions).

# Time varying vector autoregressions

- ▶ A TVP-VAR is

$$y_t = c_t + \sum_{i=1}^p A_{t,i} y_{t-i} + \varepsilon_t$$

- ▶ The variance-covariance matrix of residuals can be time dependent (i.e.,  $\Sigma_t$ )
- ▶ Estimation and identification issues are similar to the linear version case.

# Threshold Vector Autoregressions

A TVAR is

$$y_t = c_j + \sum_{i=1}^p A_{j,i} y_{t-i} + \varepsilon_{t,j} \quad r_{j-1} < w_{t-d} \leq r_j$$

- ▶ The model is linear within a particular regime, while the changes in the parameters across regimes allow for non-linearities
- ▶ It can be estimated through LS conditional on the threshold variable,  $w_{t-d}$ , the number of regimes and the order  $p$
- ▶ Standard identification procedures can be employed (e.g. Choleski)

# Data

- ▶ Quarterly data from OECD from 1960 to 2015
- ▶ Real government consumption expenditures and Gross domestic product
- ▶ For robustness: shorter time series (e.g., Istat time series)

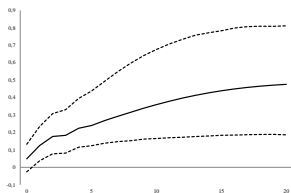


## BP filter and cross-correlations

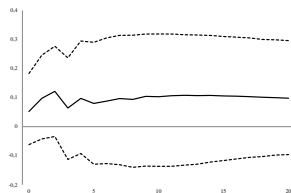
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64-12	0,01	-0,03	-0,07	-0,12	-0,18	-0,22	-0,21	-0,22 (2)
95-12	-0,11	-0,11	-0,10	-0,10	-0,08	-0,05	-0,03	-0,11 (-3)
95-07	-0,26	-0,30	-0,28	-0,19	0,01	0,24	0,42	0,46 (4)
01-12	-0,04	-0,02	-0,01	-0,03	-0,11	-0,21	-0,29	-0,34 (4)

- ▶ Public expenditures slightly counter-cyclical (with lags) over the whole sample
- ▶ The post Maastricht era looks very different (apart from the Great Recession)
- ▶ What if we had the second dip of the recession?

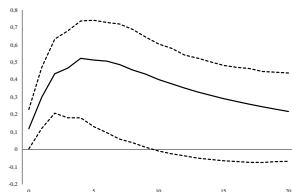
# Linear VARs



(a) 1964-2012

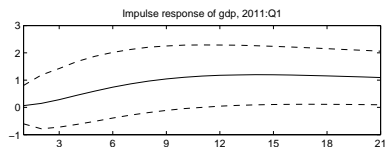
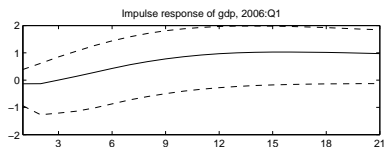
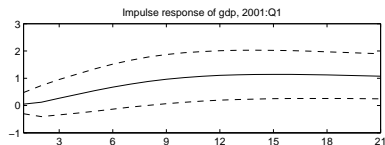
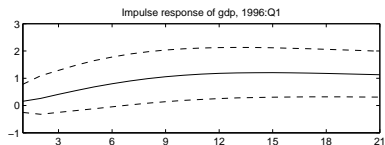
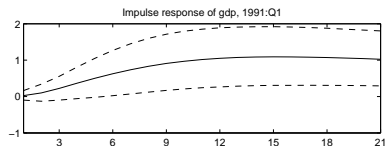
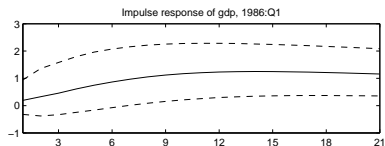


(b) 1995-2007



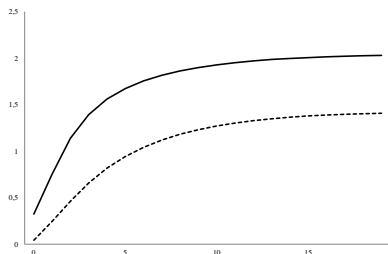
(c) 1995-2012

# Time-varying parameter VAR

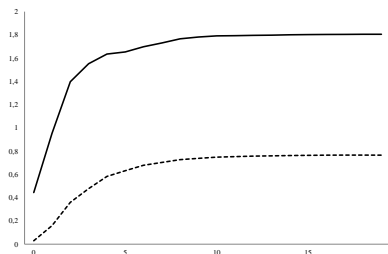


# State dependent fiscal multipliers

Figure: High growth (dashed line) vs. low growth (solid line)



(a) 1964-2012



(b) 1995-2007

## To sum up...

- ▶ We characterize public government consumption expenditures in terms of (counter-)cyclicality
- ▶ We show relevant time dependence in the effectiveness of government spending shocks
- ▶ Analysis also highlights the presence of state-dependent fiscal multipliers

## Further research

- ▶ Fiscal policies are not all the same: gross government investment, automatic stabilizers vs. discretionary fiscal policy, composition of fiscal shocks (e.g., subsidies vs. wages vs. ...), balanced budgeted spending vs. deficit spending etc.
- ▶ Excluded endogenous/exogenous relevant variables: short-/long-term interest rate, public revenues → curse of dimensionality: VAR models run soon out of power
- ▶ Single candidate for regime switching behavior → need for more general macroeconomic models
- ▶ Next step: state/time dependent analysis in a structural macroeconometric model of the Italian economy (with Leonardo Ghezzi) with a carefully implemented public sector module

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