

**The effects of fiscal policy on output
and debt sustainability:
A DSGE analysis**

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Motivation

- Use of discretionary fiscal policy in most OECD countries
- Question on the **effectiveness** of the fiscal package
- Question of the **composition** of the fiscal package

Roadmap

- Main features of the model
- Simulation results
- Conclusions

Main features

Draws extensively on existing DSGE models
(Ratto et al, 2009; Smets and Wouters,
2003)

- Closed economy
- Monopolistic product markets
- Heterogeneity in the household sector
- Adjustment costs and rigidities

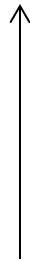
Monetary policy

Taylor rule

$$i_t = \rho_i i_{t-1} + (1 - \rho_i)[r + \vartheta_1(\pi_t - \pi^*) + \vartheta_2 \log(GAP_t)]$$



Interest rate
persistence



Neutral
interest
rate



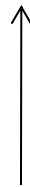
Inflation
target



Output
gap

Key feature of the model

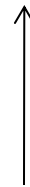
$$i g_t - i_t = \theta E_t d_{t+1}$$



Interest rates on
government debt



Policy rate



Expected
deficit

Calibrated using Laubach (2009)

Fiscal policy

Spending

$$G_t = ub_t + G_t^d + I_t^g + TR_t \quad \text{with} \quad ub_t = \varepsilon \log(GAP_t)$$

↑
↑
↑
↑

Unemploy. benefit Gov. consumption Public investment Transfers

Revenue

Tax revenues $R_t^a = t_t^w W_t L_t + t_t^c P_t C_t + t_t^k i_t^k P_t K_{t-1} + t_t^k i_g B_{t-1}$

Stabilisation rule $T_t^b = \tau_1 \left(\frac{B_t}{Y_t} - b^* \right) + \tau_2 d_t$

↑
↑

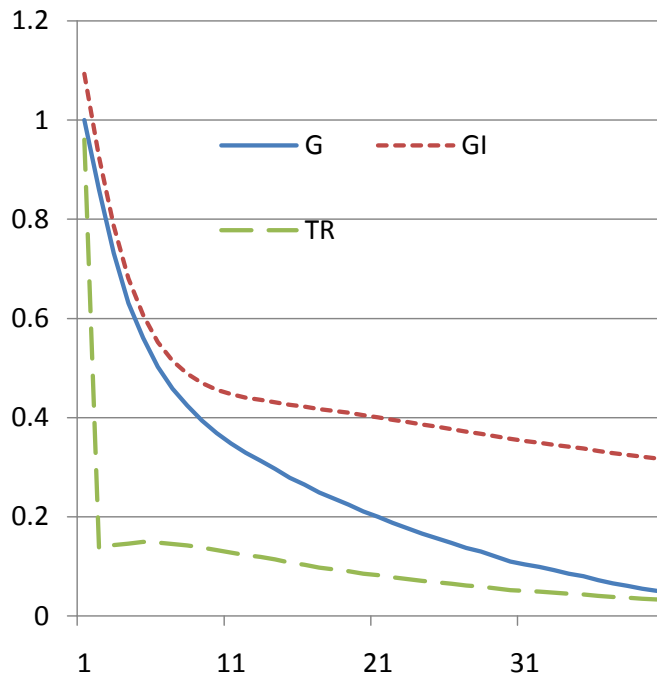
debt deficit

Fiscal policy shocks

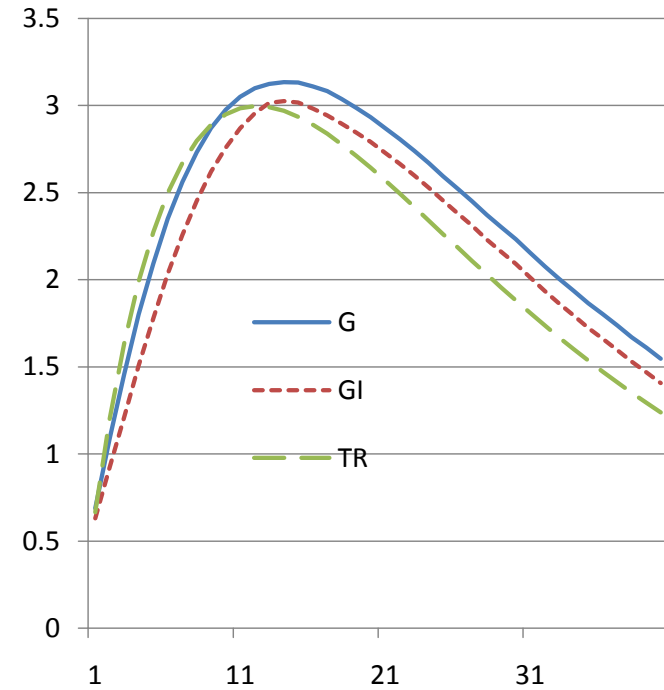
- Different policy shocks
 - Spending: government consumption, investment, transfers
 - Revenue: wage tax, consumption tax, capital tax
- All shocks amount to 1% of baseline GDP
- Temporary (last around 2 years)
- Monetary policy is assumed to be accomodative

Spending shocks

Y (per cent)

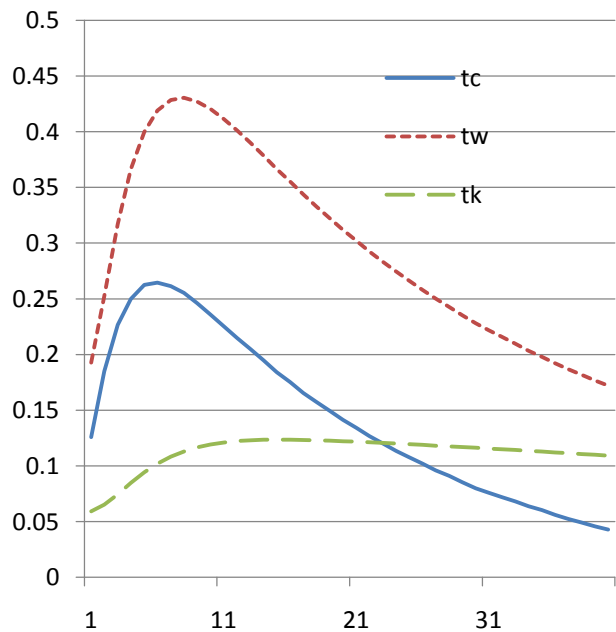


B/Y (percentage point)

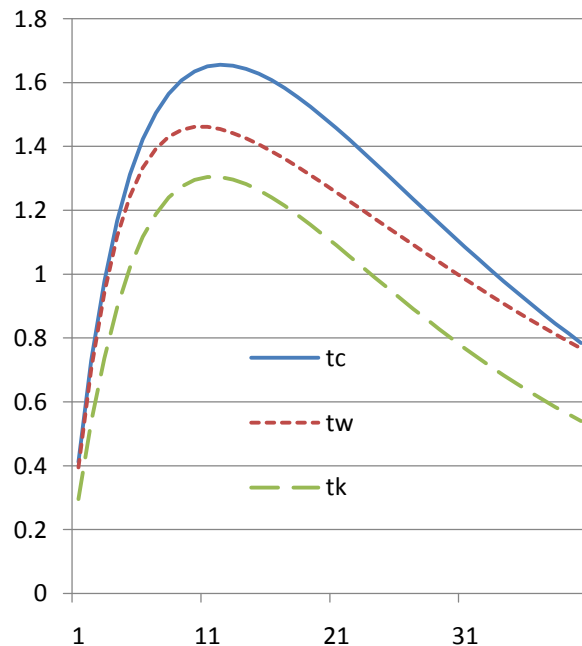


Revenue shocks

Y (per cent)



B/Y (percentage point)

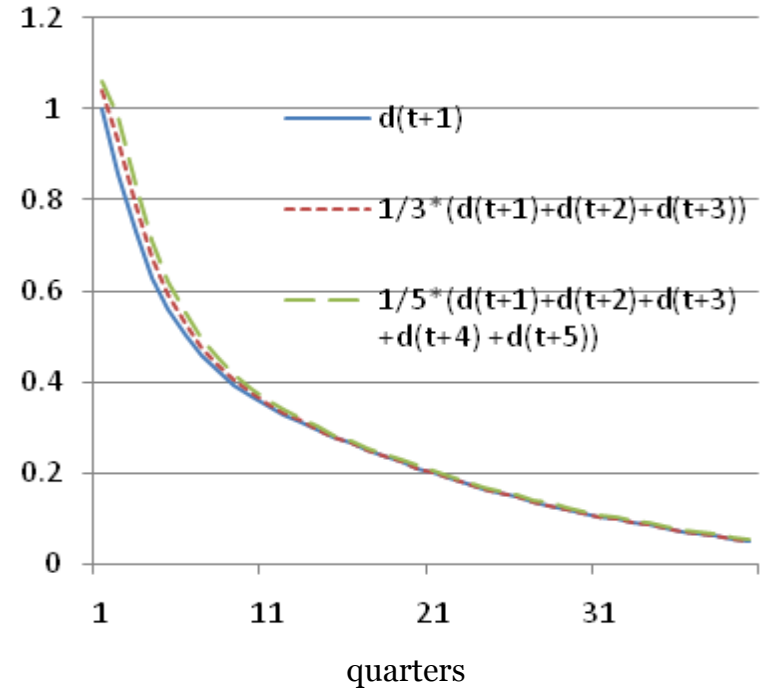
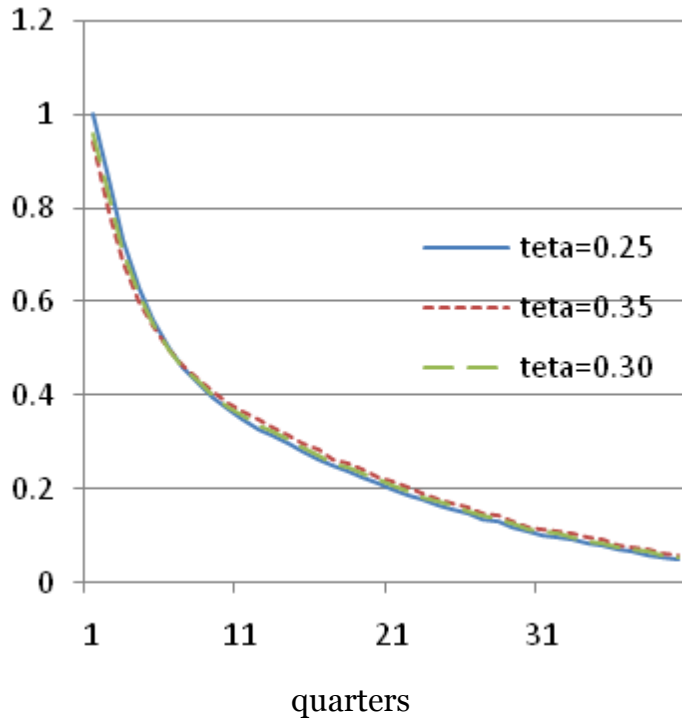


Short-term impact on activity vs. long-term implications on debt

	(1) Output increase after 1 year (%)	(2) Debt/GDP increase after 10 years (%)	Ratio (1)/(2)
Government spending Increase			
Consumption	0.64	1.54	0.42
Investment	0.68	1.40	0.49
Transfers	0.15	1.24	0.12
Tax cut			
Wage	0.36	0.77	0.46
Capital	0.08	0.54	0.15
Consumption	0.25	0.78	0.32

Robustness tests

Y
(per cent)



COMPOSITION OF THE FISCAL PACKAGE

Weighted average of euro area countries, in percentage of GDP

	2009	2010
Net effect on fiscal balances	-0.9	-0.7
Tax measures	-0.3	-0.4
For individuals	-0.2	-0.2
For businesses	-0.1	-0.1
On consumption	0.0	0.0
Contributions for public pensions, unemployment, healthcare, invalidity...	-0.1	-0.1
Others	0.0	0.0
Spending measures	0.6	0.3
Increase in government final demand	0.3	0.1
of which public investment:	0.2	0.2
Transfers to households	0.2	0.1
Transfers to businesses	0.1	0.1
Transfers to sub-national governments	0.0	0.0
Other spending	0.0	0.0

Note: The aggregate excludes Portugal and Greece.

Source: OECD Economic Outlook database.

IMPACT

(difference from baseline)

	2009	2010
GDP (per cent)	0.8	0.6
Inflation (percentage point)	0.14	0.7
Government bond rates (percentage point)	0.05	0.08
Debt/GDP (percentage point)	0.8	1.8

Main results

Fiscal policy is effective to stimulate output but the effect varies across instruments: government investment (among spending) and wage tax (among revenue) are the most effective

The fiscal package introduced in the euro area is estimated to boost activity by 0.8-0.6% in the next two years, but will also have (limited) fiscal sustainability implications.

Caveat and future work.

Thank you

Firms

Production function

$$Y_t^j = (ucap_t^j K_t^j)^\alpha (L_t^j)^{1-\alpha} (K_t^g)^{\alpha_g}$$

Demand

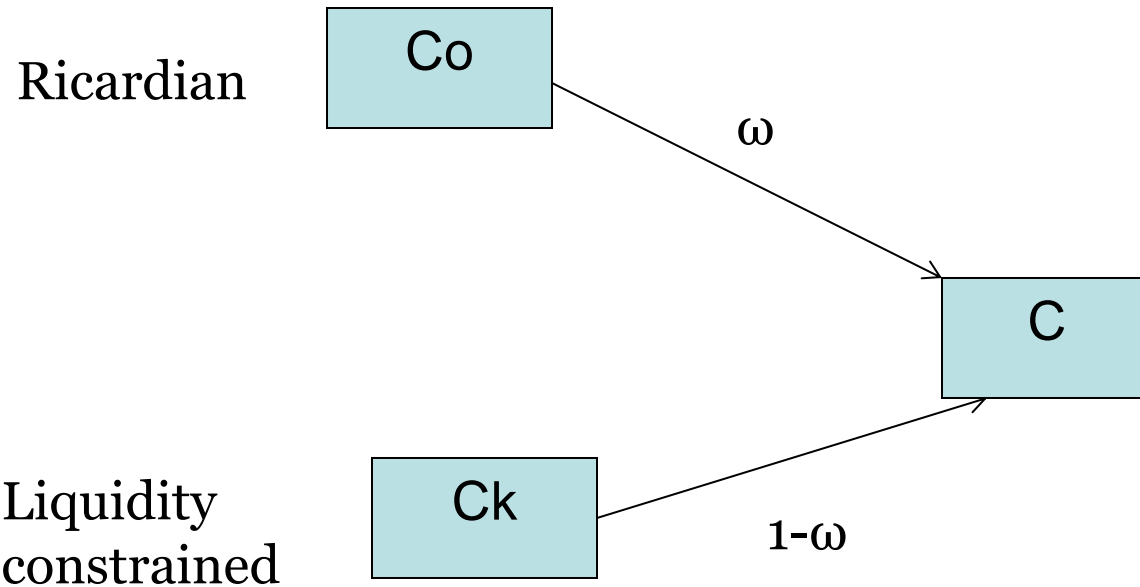
$$Y_t^j = \left(\frac{P_t}{P_t^j} \right)^\sigma (C_t + G_t + I_t)$$

Profit

$$Pr_t^j = \frac{P_t^j}{P_t} Y_t^j - \frac{W_t}{P_t} L_t^j - i_t^k K_t^j - \frac{1}{P_t} (adj^P + adj^{ucap})$$

Households

2 types of households



Endogenisation of ω :

$$\omega = \gamma \exp(\text{gap})$$

Adjustment costs

Price adjustment costs

$$adj^P = \frac{1}{P_{t-1}^j} \left(\frac{\gamma_P \Delta P_t^{j^2}}{2} \right)$$

Capacity utilisation

$$adj^{ucap} = P_t K_t \left(\gamma_{ucap,1} (ucap_t^j - 1) + \frac{\gamma_{ucap,2}}{2} (ucap_t^j - 1)^2 \right)$$

Investment

$$I_t^i = J_t^i \left(1 + \frac{\gamma_K}{2} \left(\frac{J_t^i}{K_t^i} \right) + \frac{\gamma_I}{2} (\Delta J_t^i)^2 \right)$$

Real investment
expenditure

Physical investment

Rigidities

Real wage

$$\frac{W_t}{P_t} = (1 - \gamma_w) \frac{W_{t-1}}{P_{t-1}} + \frac{1}{\eta^w} \gamma_w \frac{1 + t_t^c}{1 - t_t^w} \frac{(\omega U_{L,t}^o + (1 - \omega) U_{L,t}^k)}{(\omega U_{c,t}^o + (1 - \omega) U_{c,t}^k)}$$

Wage persistence

Reservation wage