



CPB Netherlands Bureau for Economic
Policy Analysis

Government spending shocks, sovereign risk and the exchange rate regime

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Evaluated in a SOE NK-model
Gali & Monacelli (2008)

Government
spending



Output,
consumption,
RER

Exchange
rate
regime



Sovereign
risk





Structure

1. Theoretical predictions
2. Empirical evidence
3. Our model
 - ▶ SOE NK DSGE model (Galì and Monacelli, 2008)
 - ▶ + sovereign risk (à la Davig et al., 2010)
 - ▶ + sovereign risk pass-through (à la Corsetti et al., 2012a)
4. Application: expansionary fiscal contractions



Predictions (base case)

Output effects of increase in government consumption:

	Mechanisms	Fix/Flex
Mundell-Flemming	Crowding out of exports through RER and monetary accomodation.	Flex: Zero output response. Fix: Positive output response.
New-Keynesian	Country openness determines crowding out. Monetary accomodation. Wealth effects.	Flex: Positive output response. Fix: Larger positive output response.



Predictions (+ sovereign risk)

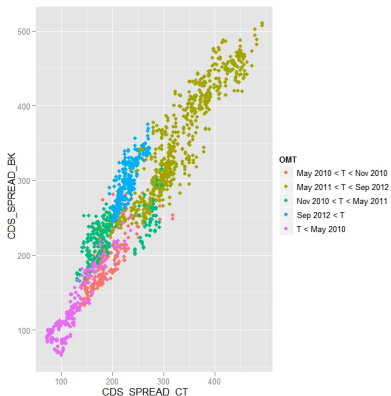
- Government spending increases sovereign risk premium
- Output effects depend on the ERR:
 - ▶ Flex: UIP-condition leads to ER depreciation, supports exports
 - ▶ Fix: CB shields households from sovereign risk. No effect.

(Corsetti et al., 2011; Born et al., 2012)

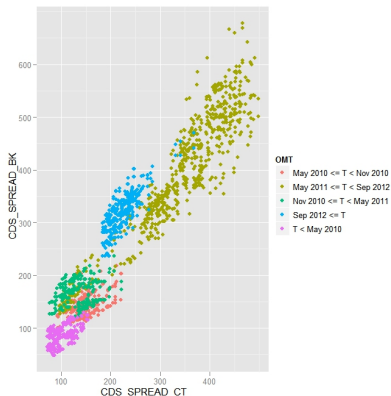


Further insights: sovereign risk \rightarrow private risk

Spain



Italy



Source: Michiel Bijlsma



Predictions (+ sovereign risk + pass-through)

- Government spending increases sovereign risk premium
 - Output effects depend on the ERR:
 - ▶ Flex: UIP-condition leads to ER depreciation, supports exports
 - ▶ Fix: CB shields households from sovereign risk. No effect
- (Corsetti et al., 2011; Born et al., 2012)
- Sovereign and private risk are now correlated. Output effects depend on the deterioration of private borrowing conditions:
 - ▶ Flex: Reduction in private borrowing leads ER depreciation, higher borrowing cost reduce consumption. Effect on multiplier indeterminate.
 - ▶ Fix: Reduction in private borrowing cost not off-set by ER depreciation. Multiplier reduces.

(Bouakez and Eyquem, 2011; Corsetti et al., 2012b)

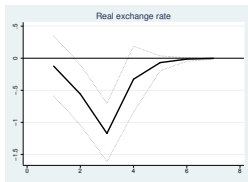
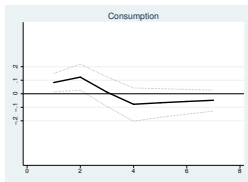
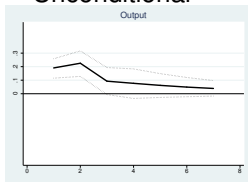


Empirical strategy

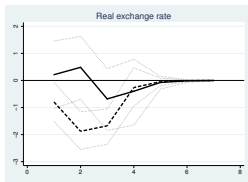
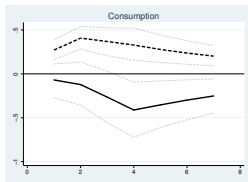
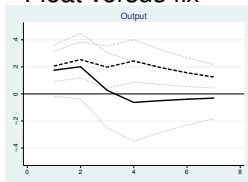
- Corsetti et al. (2012a) estimate effect of exogenous government spending shock of OECD sample using Perotti (1999)'s two-step process:
 1. Regress lagged economic variables on government consumption, identify the residuals as exogenous policy shocks
 2. Regress exogenous policy shocks on economic variables, identify the coefficients as multipliers
- They find:
 - ▶ Output multipliers higher under fix than float
 - ▶ Output multipliers lower under sovereign risk
- We distinguish the effect of sovereign risk under fixed and flexible exchange rates and repeat their analysis
- Data: 19 OECD countries, 1970 onwards

Impulse responses to a government spending shock

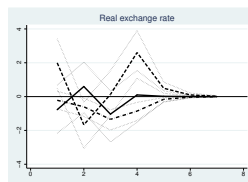
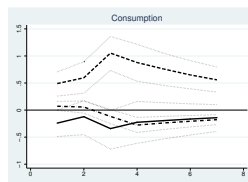
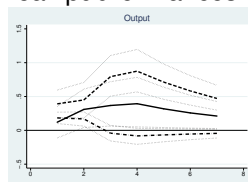
Unconditional



Float versus fix



Weak public finances





Empirical results

- Float vs peg:
 - ▶ Output responses of float and fix indistinguishable
 - ▶ Consumption rises under float and falls under fix
 - ▶ Appreciation of the RER under float
- Weak public finances:
 - ▶ Output response bigger for float
 - ▶ Consumption increases under float and decreases under fix
 - ▶ Depreciation of the RER under a float



Base case

Small open economy New Keynesian model (Galì and Monacelli, 2008):

- | | |
|-----------------|--|
| Households | <ul style="list-style-type: none">- Consume domestic and foreign goods- Work domestically and enjoy leisure- Invest in domestic government and international risk free bonds |
| Firms | <ul style="list-style-type: none">- Intermediate good firms are monopolistically competitive and employ households- Final good firms are perfectly competitive and use intermediate goods |
| Monetary policy | <ul style="list-style-type: none">- Uses a Taylor rule as a float or fixes the ER |



Base case: government

- Exogenous government consumption G_t
- Financed through lump-sum taxation T_t and debt b_t
- Fiscal policy stance ϕ_b given by a Laffer curve

$$T_t = \phi_b \frac{T}{b/\pi} \left(\frac{1}{\pi_t} b_{t-1} - \frac{1}{\pi} b \right)$$



+ Sovereign risk

Government default mechanism á la Schabert and van Wijnbergen (2011):

- Ex-ante, default is unknown to government and investors, but its probability distribution f is known (anticipation game)
- Ex-post default depends on a draw \bar{b} from this distribution
If the real debt burden $\frac{1}{\pi_t} R_{t-1} b_{t-1}$ exceeds \bar{b} default ensues
- Hence, ex-ante default probability is

$$\delta_t = \int_0^{\frac{1}{\pi_t} R_{t-1} b_{t-1}} f(\bar{b}) d\bar{b}$$



+ sovereign risk pass-through

- Incomplete asset markets
 - ▶ State contingent sec's unavailable, just safe foreign bonds
 - ▶ Private borrowing conditions and thus consumption decision influenced by sovereign riskConsumption and RER untied now
- Foreigners lend f_t to households with a risk premium Ξ_t over the international risk free rate R^*
- Risk premium Ξ_t depends on public and private debt:

$$\Xi_t = \exp\left(\frac{\chi_1 f_t q_t}{Y}\right) \exp\left(\frac{\chi_2 \delta_t b_{Ft}}{Y}\right)$$

- $\chi_1 = 0.0017$ and $\chi_2 = 0.35$ (such that 1% additional government debt yields identical risk to 1% additional private risk)



Log-linearization, calibration

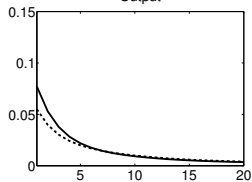
- Usual market clearing conditions
- Log-linearized around the non-stochastic steady state
- Calibrated at literature defaults
+ for a BB-rated sovereign: $\delta = 0.002$ and $\Phi = 0.01$

Parameter	Description	Value
η	Elasticity between Foreign and Home goods	1.50
α	Country openness	0.60
α^*	Foreign openness with respect to Home	0.01
σ	Inverse of the elasticity of intertemporal substitution	1.00
φ	Inverse of the Frisch labour supply elasticity	3.00
θ	Probability of non-price adjustment	0.75
β	Subjective discount factor	0.99
ϕ_{π}	Monetary policy rule coefficient, flexible exchange rate	1.50
ρ_r	Nominal interest rate smoothing parameter	0.80
ϕ_e	Monetary policy rule coefficient, fixed exchange rate	1 bn.
ϕ_b	Fiscal policy rule coefficient	0.10
ρ_g	Persistence in government spending innovations	0.90
$b_F/(4Y)$	Steady state real government debt held by Foreign to output ratio	0.60
$f/(4Y)$	Steady state real household external debt to output ratio	0.25
G/Y	Steady state government consumption to output ratio	0.25
T/Y	Steady state taxes to output ratio	0.274
C/Y	Steady state household consumption to output ratio	0.75
C^*/Y	Steady state Foreign consumption to output ratio	20.0
Φ	Sovereign default elasticity	0.01
δ	Sovereign default probability	0.002

Responses to a government spending shock under incomplete asset markets

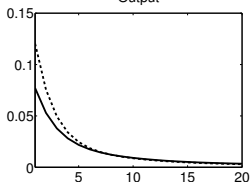
Base case

Output



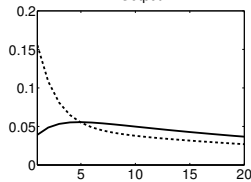
+ sovereign risk

Output

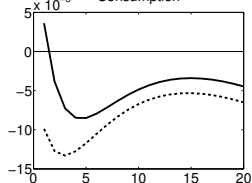


+ pass-through

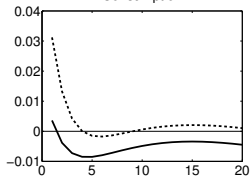
Output



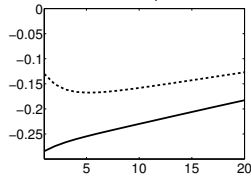
Consumption



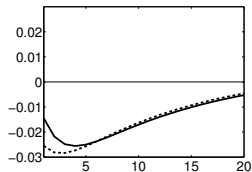
Consumption



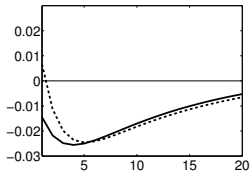
Consumption



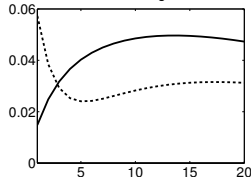
Real exchange rate



Real exchange rate



Real exchange rate





Results

- Base case
 - ▶ Output response larger under fix
 - ▶ Consumption declines eventually, but not initially under fixed (!)
 - ▶ RER appreciates
- Base case + sovereign risk
 - ▶ Output response larger under float
 - ▶ Consumption increases under float
 - ▶ Initial RER depreciation under float
- Base case + sovereign risk + pass-through
 - ▶ Output differences widen
 - ▶ Consumption decreases for both float and fix
 - ▶ RER depreciates



Robustness

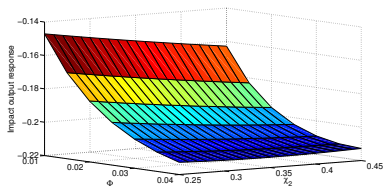
- Does the NER appreciation drive the results?
 - ▶ Yes, (peg - float) increases for higher elasticity between H and F
 - ▶ Yes, (peg - float) increases for smaller home bias
 - ▶ Yes, (peg - float) decreases for higher degree of intertemporal substitution
- Are expansionary fiscal contractions feasible?
 - ▶ Effects become more pronounced with higher default elasticity Φ
 - ▶ Effects become more pronounced with higher pass-through χ_2



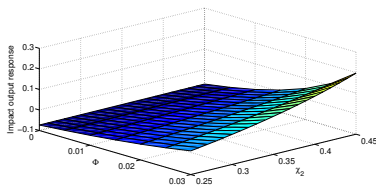
Expansionary fiscal contractions: Initially yes!

Initial output response to fiscal contraction

Flexible exchange rates



Fixed exchange rates

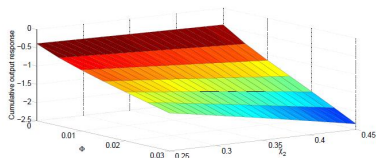




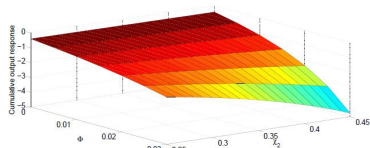
Expansionary fiscal contractions: Eventually no!

Cumulative output response to fiscal contraction

Flexible exchange rates



Fixed exchange rates





Conclusion

- With sovereign risk, output multipliers larger under float due to depreciation (De Grauwe, 2012)
- Perfect capital markets shield households from sovereign risk under fix
- With pass-through household borrowing conditions are adversely affected by sovereign risk, increasing the output differences between pegs and floats
This is an additional cost of a monetary union
- Expansionary fiscal contractions are possible under fixed ER with sufficient sovereign risk, however only initially.
- Data provides a poor match for consumption



Thank you for your attention!



Bibliography I

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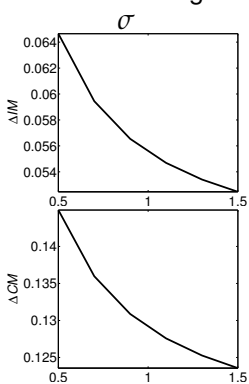
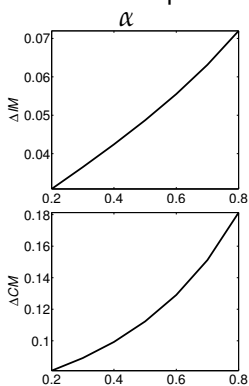
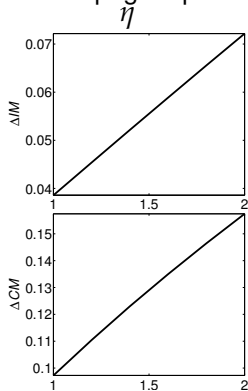
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Bibliography III

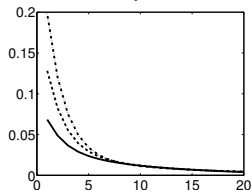
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Float vs. peg: impulse and cumulative output multipliers under sovereign risk

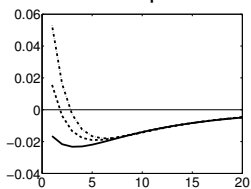


Complete asset markets, flexible exchange rates: effect of Φ

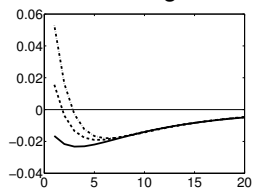
Output



Consumption



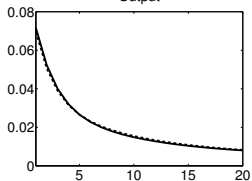
Real exchange rate



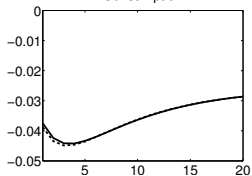
Incomplete asset markets: effect of Φ

$\Phi = 0$

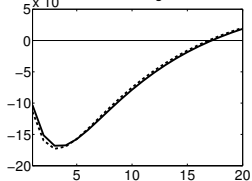
Output



Consumption

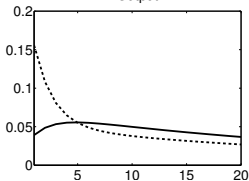


$\times 10^{-3}$ Real exchange rate

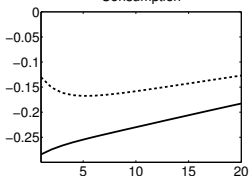


$\phi = 0.01$

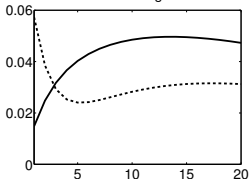
Output



Consumption

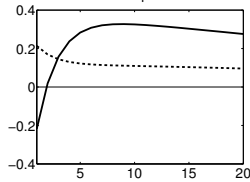


Real exchange rate

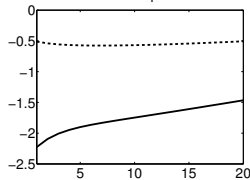


$\Phi = 0.04$

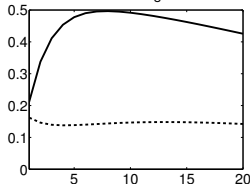
Output



Consumption



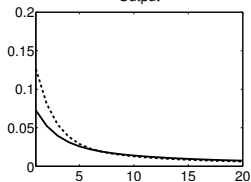
Real exchange rate



Incomplete asset markets: effect of χ_2

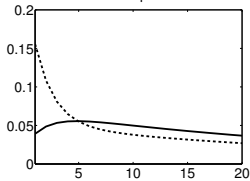
$\chi_2 = 0.05$

Output



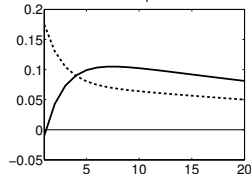
$\chi_2 = 0.35$

Output

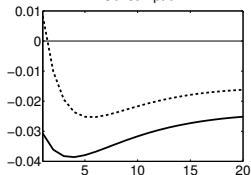


$\chi_2 = 0.65$

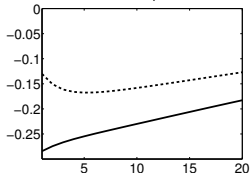
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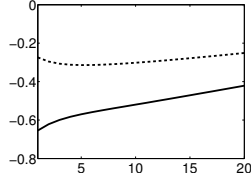
Consumption



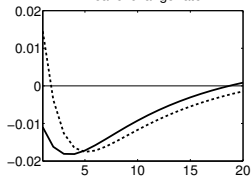
Consumption



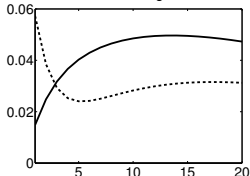
Consumption



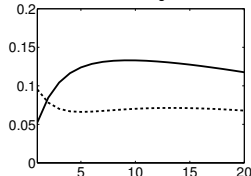
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Real exchange rate



Real exchange rate



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C/Y	Steady state household consumption to output ratio	0.75
C^*/Y	Steady state Foreign consumption to output ratio	20.0
Φ	Sovereign default elasticity	0.01
δ	Sovereign default probability	0.002
χ_1	Risk premium elasticity w.r.t. household net foreign debt	0.0017
χ_2	Risk premium elasticity w.r.t. sovereign default losses	0.35