Government spending shocks, sovereign risk and the exchange rate regime

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

Government spending

Exchange rate regime

Output, consumption, RER

Sovereign risk
Structure

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

Output effects of increase in government consumption:

<table>
<thead>
<tr>
<th>Mechanisms</th>
<th>Fix/Flex</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mundell-Flemming</strong></td>
<td></td>
</tr>
<tr>
<td>Crowding out of exports through RER and monetary accommodation.</td>
<td>Flex: Zero output response.</td>
</tr>
<tr>
<td></td>
<td>Fix: Positive output response.</td>
</tr>
<tr>
<td><strong>New-Keynesian</strong></td>
<td></td>
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<td></td>
<td>Fix: Larger positive output response.</td>
</tr>
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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 → 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

Output

Consumption

Real exchange rate

Float versus fix

Output

Consumption

Real exchange rate

Weak public finances

Output

Consumption

Real exchange rate
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 (Gali and Monacelli, 2008):

Households
- Consume domestic and foreign goods
- Work domestically and enjoy leisure
- Invest in domestic government and international risk free bonds

Firms
- Intermediate good firms are monopolistically competitive and employ households
- Final good firms are perfectly competitive and use intermediate goods

Monetary policy
- 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 $\phi_b$ 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 à 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 risk
    Consumption and RER untied now
- Foreigners lend \( f_t \) to households with a risk premium \( \Xi_t \) over the international risk free rate \( R^* \)
- Risk premium \( \Xi_t \) 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 $\Phi = 0.01$
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>(\eta)</td>
<td>Elasticity between Foreign and Home goods</td>
<td>1.50</td>
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<tr>
<td>(\alpha)</td>
<td>Country openness</td>
<td>0.60</td>
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<tr>
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<td>(\varphi)</td>
<td>Inverse of the Frisch labour supply elasticity</td>
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<td>(\theta)</td>
<td>Probability of non-price adjustment</td>
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<td>(\beta)</td>
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<td>(\phi_\pi)</td>
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<td>(\rho_r)</td>
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<td>1 bn.</td>
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<td>Fiscal policy rule coefficient</td>
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<td>(\rho_g)</td>
<td>Persistence in government spending innovations</td>
<td>0.90</td>
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<tr>
<td>(b_F/(4Y))</td>
<td>Steady state real government debt held by Foreign to output ratio</td>
<td>0.60</td>
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<td>(T/Y)</td>
<td>Steady state taxes to output ratio</td>
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<td>(C/Y)</td>
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<td>(C^*/Y)</td>
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<td>20.0</td>
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<td>(\Phi)</td>
<td>Sovereign default elasticity</td>
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<td>(\delta)</td>
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<td>0.002</td>
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Responses to a government spending shock under incomplete asset markets

Base case

+ sovereign risk

+ pass-through
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 $\Phi$
  - Effects become more pronounced with higher pass-through $\chi_2$
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


Bibliography II


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

\[ \eta \]

\[ \alpha \]

\[ \sigma \]
Complete asset markets, flexible exchange rates: effect of $\Phi$

Output

Consumption

Real exchange rate
Incomplete asset markets: effect of $\Phi$

$\Phi = 0$

$\phi = 0.01$

$\Phi = 0.04$
Incomplete asset markets: effect of $\chi_2$

$\chi_2 = 0.05$

$\chi_2 = 0.35$

$\chi_2 = 0.65$
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