Discussion on "A Model of Pro-Cyclical Exchange Rates"

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The paper in a nutshell

A model to capture pro-cyclicality of exchange rates observed in data

- H: US; e_t: foreign currency per US dollar
- Assume no arbitrage and access to foreign assets
  - $E_t[M^F_{t+1}R^F_{t+1}] = 1;\ E_t\left[M^H_{t+1}\frac{e_t}{e_{t+1}}R^F_{t+1}\right] = 1$ ➔ $\frac{e_{t+1}}{e_t} = \frac{M^H_{t+1}}{M^F_{t+1}}$
- $cov(\Delta e_{t+1}, \Delta c^H_{t+1} - \Delta c^F_{t+1}) = cov(m^H_{t+1} - m^F_{t+1}, \Delta c^H_{t+1} - \Delta c^F_{t+1})$
- Plain-vanilla model: $cov(m^H_{t+1} - m^F_{t+1}, \Delta c^H_{t+1} - \Delta c^F_{t+1}) < 0$ ➔ Backus-Smith puzzle

- Two possible solutions
  - $\Delta e_{t+1} = m^H_{t+1} - m^F_{t+1} + \eta_{t+1}$ - violation of no-arbitrage
  - m_{t+1} is not always negatively correlated with Δc_{t+1}

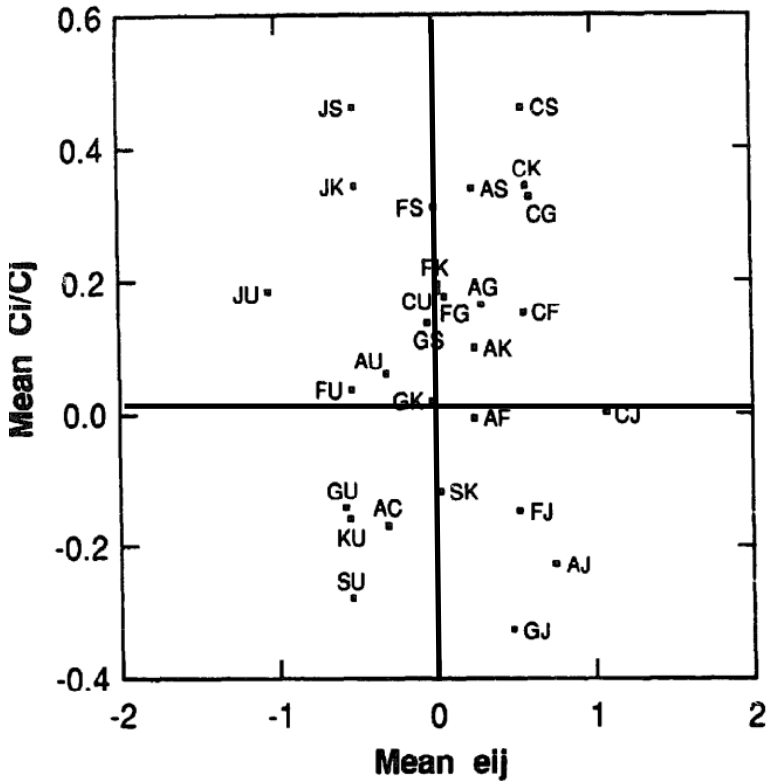
- This paper introduces displacive shock + incomplete market to make correlation between m_{t+1} and Δc_{t+1} possibly positive
  - Single country: $\Delta c_{t+1} = \epsilon^{\mathrm{H}}_{\mathrm{t+1}} + \delta u^{\mathrm{H}}_{\mathrm{t+1}}$; $m^H_{t+1} = -\Delta c^H_{t+1} + u^H_{t+1}$
  - Two countries:
    - $\Delta c^H_{t+1} - \Delta c^F_{t+1} = \gamma_1 (\epsilon^{\mathrm{H}}_{\mathrm{t+1}} - \epsilon^{\mathrm{F}}_{\mathrm{t+1}}) + \gamma_2 (u^{\mathrm{H}}_{\mathrm{t+1}} - u^{\mathrm{F}}_{\mathrm{t+1}})$
    - $m^H_{t+1} - m^F_{t+1} = -\gamma_3 (\epsilon^{\mathrm{H}}_{\mathrm{t+1}} - \epsilon^{\mathrm{F}}_{\mathrm{t+1}}) + \gamma_4 (u^{\mathrm{H}}_{\mathrm{t+1}} - u^{\mathrm{F}}_{\mathrm{t+1}})$
    - $cov(m^H_{t+1} - m^F_{t+1}, \Delta c^H_{t+1} - \Delta c^F_{t+1}) = -\gamma_1\gamma_3\, var(\epsilon^{\mathrm{H}}_{\mathrm{t+1}} - \epsilon^{\mathrm{F}}_{\mathrm{t+1}}) + \gamma_2\gamma_4\, var(u^{\mathrm{H}}_{\mathrm{t+1}} - u^{\mathrm{F}}_{\mathrm{t+1}})$
    - When γs are all positive, ϵ_{t+1}: counter-cyclical FX; u_{t+1}: pro-cyclical FX

Summary

- A great paper – a simple model that goes a long way in explaining puzzles FX puzzles

- My discussion focuses on whether we can push the model further to match nuances in FX cyclicality observed in data.
  - Cyclicality of FX depends on currency pairs and sample periods.
  - Does the model has the potential to match heterogeneity – both cross-sectional and temporal - in FX cyclicality?

Cyclicality of FX depends on currency pair

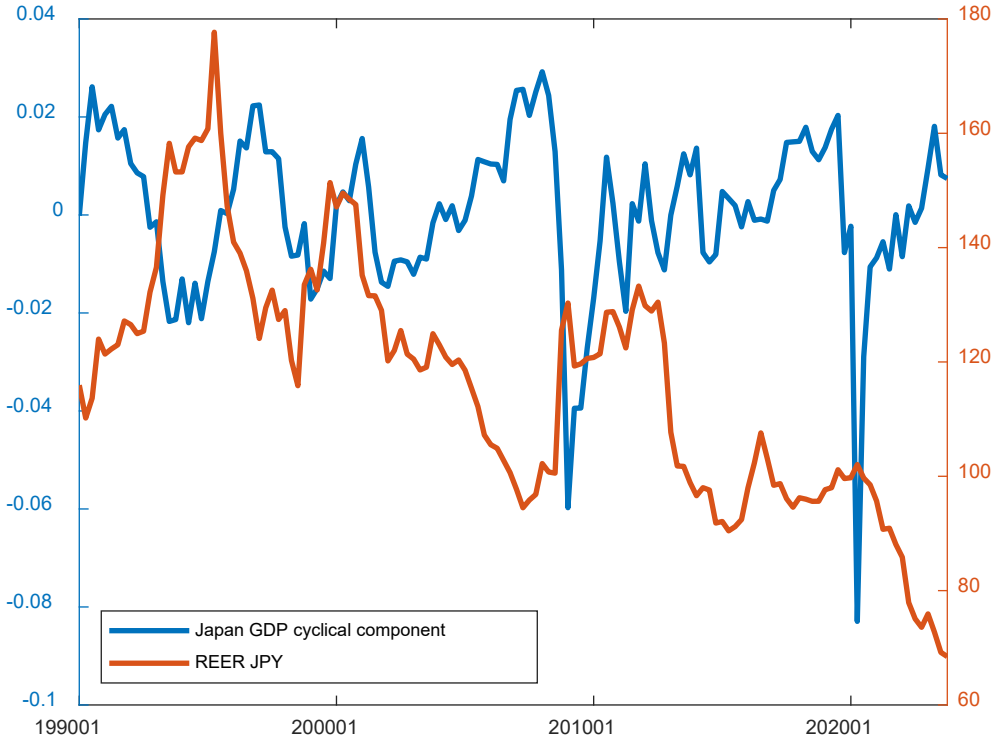


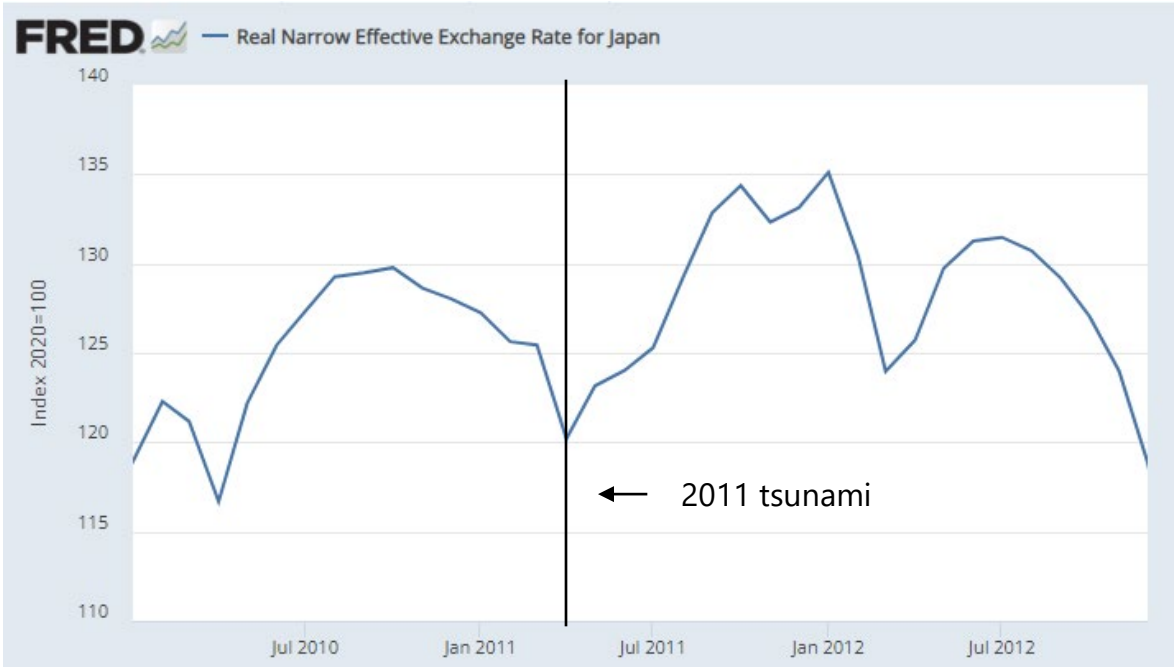
Source: Backus and Smith (1993).

	Cross-country Mean	Cross-country SD	Cross-country Min	Cross-country Max
Panel C. Cyclicality				
$\text{corr}(\Delta q, \Delta c - \Delta c^*)$	−0.07	0.09	−0.22	0.14
	(0.05)	(0.03)	(0.07)	(0.10)
$\beta_{Backus\text{-}Smith}$	−0.01	0.02	−0.03	0.02
	(0.01)	(0.00)	(0.01)	(0.02)
$\text{corr}(-\Delta q, \Delta c^*)$	−0.02	0.12	−0.21	0.24
	(0.03)	(0.03)	(0.07)	(0.09)

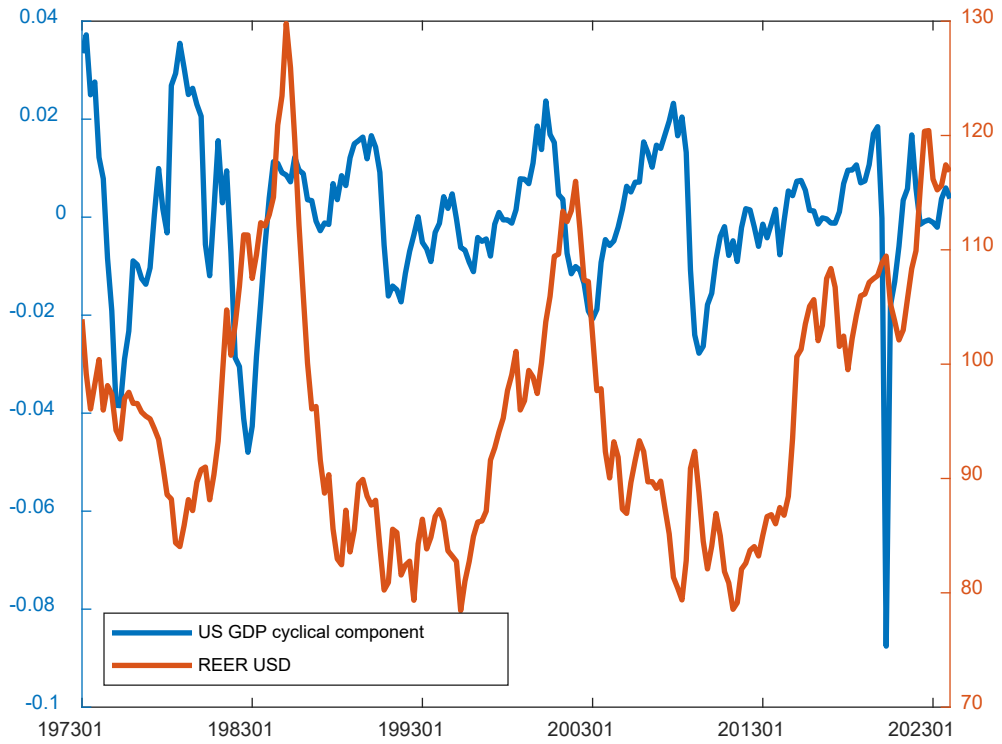
Source: Lustig and Verdelhan (2019).

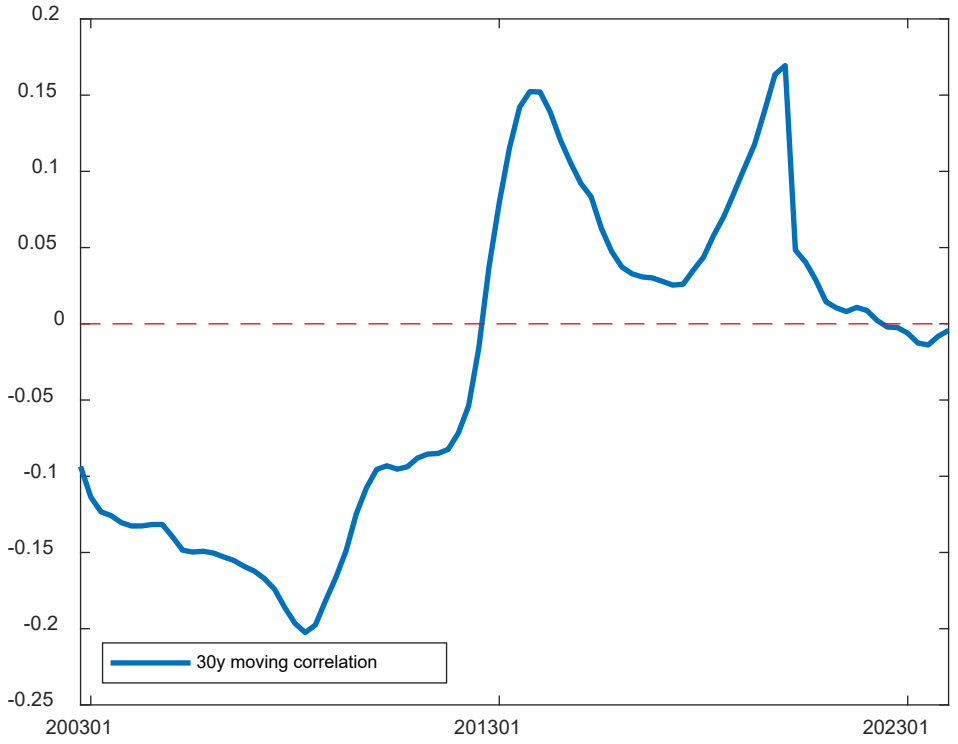
JPY seems to be counter-cyclical (safe haven currency)



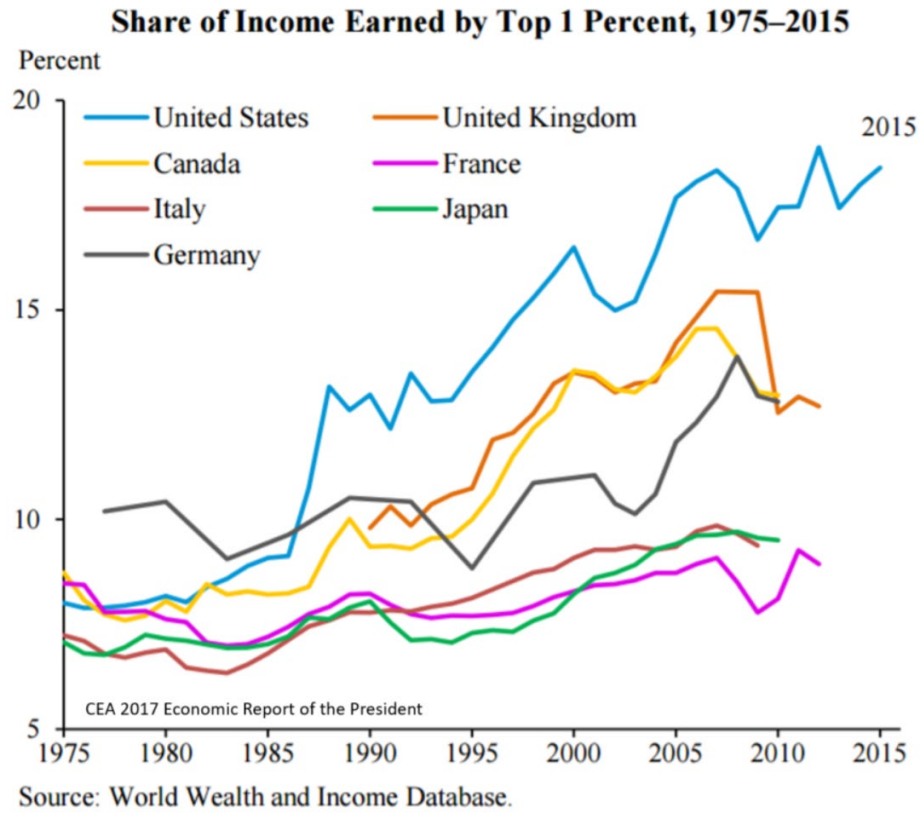


Cyclicality of FX depends on the sample period





Does the model has the potential to match these features?



Let's proxy relevance of displacive shock by income inequality.

- JP: income inequality is low relative to other countries → neutral shock dominates → FX is counter-cyclical
- US: income inequality is increasing faster than other countries → displacive shocks is gaining importance → FX turning more pro-cyclical

Minor comments

- Why are macro series, such as consumption, PPP-adjusted? To obtain real measures, price-adjustment should be enough.
- Why is FX HP-filtered? In asset pricing models, it is level of FX instead of cyclical component of FX that is related to the pricing kernel.
- Some equations may need some adjustments (Eqn 26,29 and 30).
- Implication for monetary policy? How shall policy makers respond differently to neutral shock vs displacive shock for FX considerations?

To conclude

- A simple model with a great potential to explain cyclicality properties of FX observed in data

- Instead of focusing on pro-cyclicality of FX, the authors may want to test whether the model can capture cross-sectional and temporal heterogeneity of FX cyclicality, further validating the model.