

The Exchange Rate Insulation Puzzle

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The views stated herein are those of the authors and are not necessarily those of the ECB.

How much insulation can flexible exchange rates provide?

Answer of first-order importance

- ▶ Modeling
- ▶ Policymaking
- ▶ Costs of currency unions

Classical view

- ▶ Automatic shock absorber that softens impact of external shocks

This paper

- ▶ Provide novel empirical evidence: no insulation
- ▶ Model-based interpretation: reflects policy choice

Skepticism about the virtue of exchange-rate flexibility abounds

Unconditional evidence (Baxter Stockman 1989, Itskhoki Mukhin 2020)

- ▶ Business cycles of peggers and floaters look similar
- ▶ Even though the nominal exchange rate is much more volatile for floaters

	Peg		Float	
	$\sigma(x_i)$	$\rho(x_i, x_{EA})$	$\sigma(x_i)$	$\rho(x_i, x_{EA})$
FX	4.18	–	13.02	–
IP	6.97	0.55	6.18	0.57
HICP	2.32	0.52	3.48	0.31
PPI	4.04	0.68	4.99	0.44

This paper

- ▶ Look at conditional correlations following specific external shocks (monetary, credit)

Skepticism about the virtue of exchange-rate flexibility abounds

US-dominated global financial cycle (Rey 2013, Miranda-Agrippino Rey 2020)

- ▶ Associated capital flows create a “dilemma” for domestic monetary authorities
- ▶ Independent monetary policies possible only if capital account is managed

This paper

- ▶ Focus on euro area as source of shocks 1999–2018
- ▶ Spillovers on geopolitical neighbors: heterogeneity with respect to exchange-rate regime (otherwise fairly homogenous)
- ▶ But: even in this sample, response of real activity and inflation to external shocks is rather similar for countries that peg or float vis-à-vis the euro (“exchange rate insulation puzzle”)

Skepticism about the virtue of exchange-rate flexibility abounds

Limited expenditure switching

- ▶ Pricing to market reduces exchange rate pass through (Devereux Engel 2003)
- ▶ Dominant currency pricing (Gopinath et al. 2020)

This paper

- ▶ Euro is dominant currency in our sample
- ▶ But: while flexible exchange rates do not actually provide insulation, they can in principle
- ▶ Model-based analysis of policy trade offs

Related literature

Classical view

- ▶ Meade (1951), Friedman (1953), Mundell (1962), Fleming (1962), Eichengreen/Sachs (1985) ... Schmitt-Grohé Uribe (2016).

Skepticism about exchange rate flexibility

- ▶ Rey (2013), Devereux/Engel (2003), Gopinath et al. (2020), Obstfeld (2020)

Exchange-rate regime and economic performance

- ▶ Classic studies: Bayoumi/Eichengreen (1994), Baxter/Stockman (1989), Levy-Yeyati/ Sturzenegger (2003), Broda (2004)
- ▶ More recently: Aizenmann et al (2016), Obstfeld et al (2019), Rose/Spiegel (2011), Cerutti et al (2019), Itskhoki/Mukhin (2020)

Monetary autonomy and policy framework

- ▶ FoF: Calvo Reinhart (2002), di Giovanni Shambaugh (2008), Klein Shambaugh (2015)
- ▶ Trilemma: Shambaugh (2004), Obstfeld et al (2005), Goldberg (2013), Edwards (2015)
- ▶ Optimal policy: Senay/Sutherland (2015), Mukhin (2018), Egorov/Mukhin (2020), Corsetti et al (2020)
- ▶ Plurality of instruments: Adrian et al (2020), Basu et al. (2020).

International transmission of monetary shocks

- ▶ Fed (global financial cycle): Bluedorn Bowlder (2010), Miranda-Agrippino Rey (2020), Rey (2013), Bräuning Ivashina (2019), Iacovello Navarro (2019), Jordà et al (2019)
- ▶ ECB shocks: Jarocinski (2020).

Euro-area shocks and fx-rate regime of its neighbors

Data set w/ monthly observations for period 1999 to 2018

- ▶ Euro area (EA 11) as the source of shocks
- ▶ 20 neighbor countries with different exchange rate policy vis-à-vis euro: EU27 net of EA11, plus UK, plus EFTA3: Iceland, Norway, Switzerland
- ▶ baseline: monetary shocks (Jarociński Karadi, 2020)

Exchange rate regime in neighbor countries, based on Ilzetzki Reinhart Rogoff (2019)

- ▶ Floats: IRR category 9 (broad bands or managed float) through 14 (free float)
- ▶ Category 9: Exchange rate does not fluctuate by more than two percent *per month* in 80 percent of the months over a five-year window. Pegs: rest (including euro membership)
- ▶ Some 1800/4800 country-month observations qualify as float

Estimate spillovers: empirical model

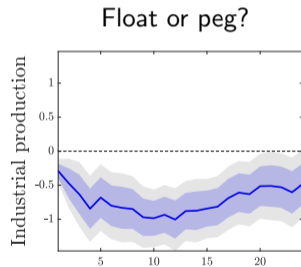
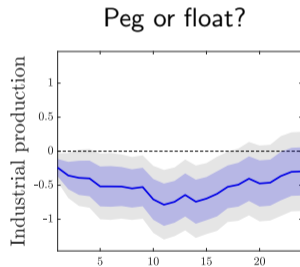
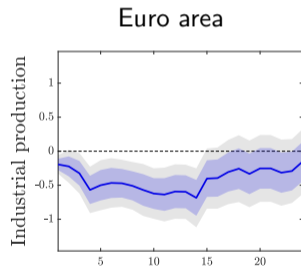
Estimate local projection (Jordà 2005)

$$\underline{x_{n,t+h}} = \alpha_{n,h} + \mathbf{z}'_{n,t} \cdot \boldsymbol{\beta}_h + \underline{\gamma_h^p (1 - \mathbb{I}_{n,t-1}) \bar{\epsilon}_t} + \underline{\gamma_h^f \mathbb{I}_{n,t-1} \bar{\epsilon}_t} + u_{n,t+h}, \quad t = 1, \dots, T.$$

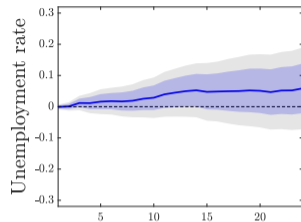
- ▶ Variable of interest: $x_{n,t+h}$; $\mathbb{I}_{n,t-1} = 1$ if float
- ▶ Controls $\mathbf{z}_{n,t}$: twelve lags of dependent variable and shocks (baseline)
- ▶ $\bar{\epsilon}_t$: euro-area shock (Jarociński Karadi 2020)

Evidence: euro-area monetary tightening

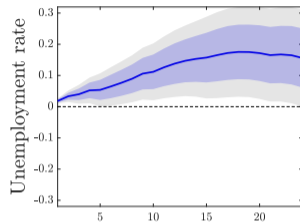
- ▶ Euro area monetary policy shocks generate large spillovers on neighbor countries
- ▶ Flexible exchange rates seem to fail to provide insulation



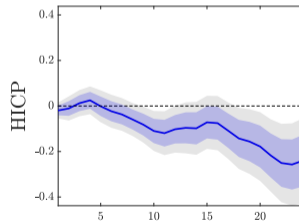
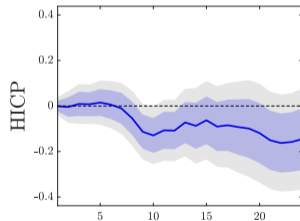
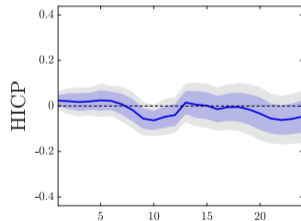
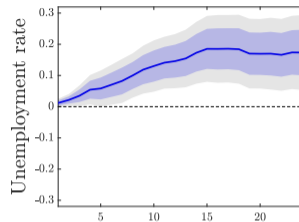
Euro area



Neighbor pegs

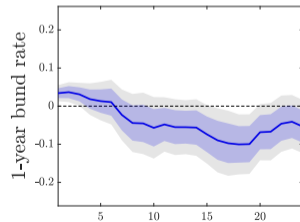
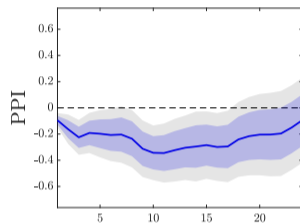


Neighbor floats

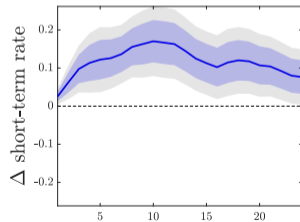
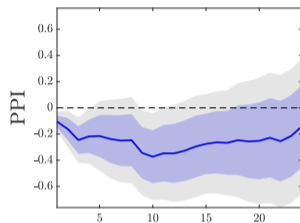


Response to euro-area monetary policy shock cont'd

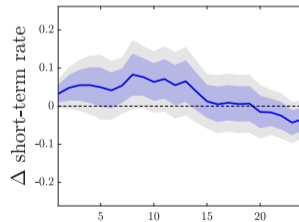
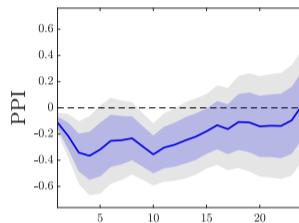
Euro area



Neighbor pegs



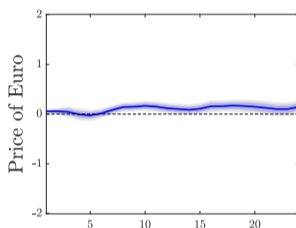
Neighbor floats



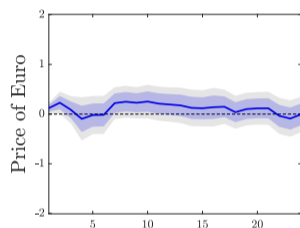
Response to euro-area monetary policy shock cont'd

Euro area

Neighbor pegs



Neighbor floats



Very similar patterns for other shocks

- ▶ Central bank info shocks (Jarociński Karadi 2020)
- ▶ Credit shocks (Gilchrist Mojon 2018)

Does endogeneity of fx-regime choice explain result? Unlikely

Conjecture

- ▶ More vulnerable countries opt for float (precisely because it is as automatic absorber)
- ▶ This is why we don't find insulation

But floats not any more vulnerable than pegs:

	Peg	Float
Size (in percent of EA GDP)	0.9	5.0
Trade openness vis-à-vis EA	42.2	40.6
Capital account openness (Chinn Ito index)	1.9	2.1
Terms of trade volatility	3.7	2.5

Various robustness checks in paper

- ▶ Classification of the exchange rate regime, country groups, crisis episodes and countries, additional controls

New Keynesian two-country model

Basic structure

- ▶ Monopolistic competition and sticky prices
- ▶ Goods market incompletely integrated because of home bias
- ▶ Unrestricted cross-border trade of state-contingent securities

Two countries: Home and Foreign

- ▶ Differ in size: Foreign (euro area) large, Home small (neighbor country)
- ▶ Home exports and imports priced in euro (DCP): see evidence in paper
- ▶ Monetary policy Home: exchange rate peg, inflation targeting, or targeting natural output

Monetary shock: Foreign (representing euro area)

Analytical results for a number of shocks in paper, for a special case

- ▶ Linearized equilibrium conditions (symmetric zero-inflation steady state)
- ▶ Unitary trade elasticity and infinitely elastic labor supply (relaxed in numerical analysis)
- ▶ Shocks are Markov. Persist with prob μ , else cease forever

While contractionary Foreign monetary shock lasts,

$$y_L^* < 0.$$

$$\pi_L^* < 0.$$

$$r_L^* > 0.$$

Exchange rate peg implies

$$y_t = y_t^*, \pi_t = \pi_t^*, \text{ and } r_t = r_t^*$$

A benchmark and a first result

Flex-price allocation

$$s_t^n = -y_t^* \text{ and } y_t^n = 0.$$

- ▶ Terms of trade deteriorate if external shock recessionary, absorb any effect on activity

Sticky prices, DCP: irrespective of monetary policy, actual terms of trade constant

$$s_t = 0.$$

- ▶ Exports and imports priced in euros; terms of trade adjust sluggishly (Gopinath et al 2020)
- ▶ No monetary policy that replicates the flex-price allocation
- ▶ No divine coincidence breaks down: monetary policy faces trade-off between output and inflation stabilization

Monetary policy trade-off

Insulate output from foreign shock (Proposition 3 in paper)

- ▶ Expenditure switch at Home (because exports priced in euro): reduce interest rates
- ▶ persistent nominal depreciation: $e_t^L > 0$
- ▶ Persistent inflation: Producer price: $\pi_{H,t}^L > 0$ and consumer price: $\pi_t^L > 0$.

Insulate CPI-inflation $\pi_t = 0$ (Proposition 5 in paper)

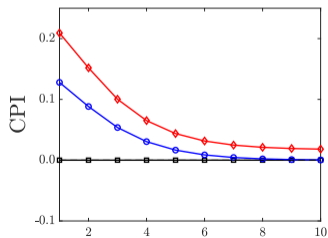
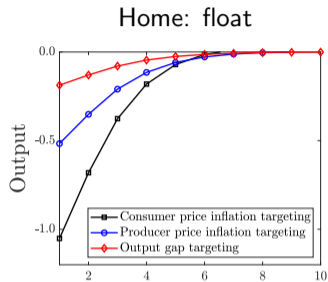
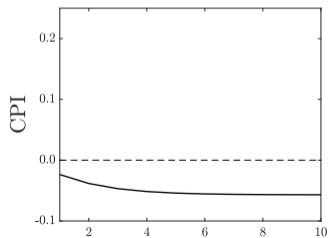
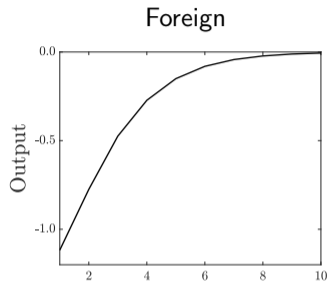
- ▶ Some *decline* of domestic producer prices: $\pi_{H,t}^L < 0$
- ▶ Recessionary impact/ spillovers: $0 > y_t^L \geq y_L^*$
- ▶ Exchange rate depreciates still: $e_t^L > 0$

Calibration and simulation

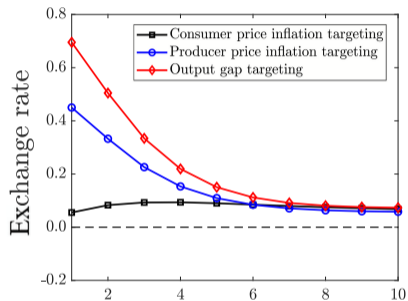
- ▶ Relax some simplifying assumptions: AR(1) shock, non-unitary trade elasticity, labor supply not infinitely elastic, roundabout production with imported inputs
- ▶ Foreign monetary policy follows conventional Taylor-type interest rate rule
- ▶ Where possible, parameterization follows Gopinath et al (2020)

Parameters	Description	Values
β	Discount factor	0.995
φ	Inverse of labor supply elasticity	0.4
ϵ	Elasticity of substitution between intermediate goods	10
η	Trade elasticity	2
v	Share of imported goods	0.3
α	Share of intermediate inputs in production	2/3
ω	Price adjustment costs	300

Adjustment to Foreign monetary policy shock



Adjustment to Foreign monetary policy shock cont'd



Conclusion

Exchange rate insulation puzzle

- ▶ Output spillovers from euro area, and seem no smaller for floaters
- ▶ Theory: closing output gap under DCP requires inflation
- ▶ Quantitative analysis: with CPI target, monetary spillovers the same under peg and float

Take-away

- ▶ Insulation may involve trade-offs
- ▶ Float provides autonomous choice how to *resolve* the trade-offs
- ▶ This choice, in turn, governs the insulation observed in the data

At fundamental level the puzzle still stands: why are policy makers tolerating exposure of output and employment to external shocks?