The Shock Matter: Improving our Estimates of Exchange Rate Pass Through

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Discussion by Giancarlo Corsetti
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Rethinking the Link Between Exchange Rates and Inflation:
Misperceptions and New Approaches
Bank of England, 28 September 2015

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- A most welcome back-to-basics exercise

Outline of discussion

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- Nominal rigidities
- More evidence

Exchange rate pass-through (ERPT)

Let $\mathcal{E}$ be the exchange rate. The price of Home imports f in Home currency **at the border** $\bar{p}$ is:

$$\bar{p}(f) = \overbrace{MKP\,(.)}^{\substack{\text{Foreign firms' markup} \\ \text{in the Home market}}} \cdot \overbrace{\mathcal{E} \cdot MC^*}^{\substack{\text{Foreign marginal costs MC}^* \\ \text{in Home currency}}}$$

EPRT is the **elasticity of import prices (at the border) with respect to the exchange rate**

$$\frac{\partial \bar{p}(f)}{\bar{p}(f)} \Big/ \frac{\partial \mathcal{E}}{\mathcal{E}}$$

- Shocks generally move $\mathcal{E}$ MC^* and $MPK\,(.)$ differently: the ERPT is shock contingent.
- It also vary with structural characteristics of the economy.

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  - This is NOT the belief underlying the paper (although FHN allow for non-fundamental shocks).

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  - all shocks hitting the economy in the sample period
- An example of coefficient from Corsetti Dedola Leduc JME 2008:

$$\widehat{\overline{P}}_{\mathrm{F},t} = \frac{1}{1+\mu\left(mkp_{\mathrm{F}}-1\right)+\kappa_{\mathrm{F}}^{p}\pi^{2}\left(mkp_{\mathrm{F}}-1\right)\left(1+\beta\right)}\left(\widehat{\mathcal{E}}_{t}+\widehat{MC^{*}}_{\mathrm{F},t}\right)$$
$$+\frac{\mu\left(mkp_{\mathrm{F}}-1\right)\left(\widehat{P}_{\mathrm{N},t}\right)+\kappa_{\mathrm{F}}^{p}\pi^{2}\left(mkp_{\mathrm{F}}-1\right)\left(\beta E_{t}\widehat{\overline{P}}_{\mathrm{F},t+1}+\widehat{\overline{P}}_{\mathrm{F},t-1}\right)}{1+\mu\left(mkp_{\mathrm{F}}-1\right)+\kappa_{\mathrm{F}}^{p}\pi^{2}\left(mkp_{\mathrm{F}}-1\right)\left(1+\beta\right)}$$

Structural vs contingent pass-through

Structural pass through not useful in addressing policy questions such as: what is the inflationary impact of a fall in oil prices? For this question, you need to calculate ERPT contingent on specific shock: oil, monetary, financial.

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- Model-based example from Corsetti Dedola JIE 2008:

Table 2
Impact responses of selected variables to nominal and real shocks[a] (percentage deviations from steady-state values and elasticities)

	Monetary shock	Shock to tradables		Shock to nontradables		Economy-wide shock	
		Temporary	Permanent	Temporary	Permanent	Temporary	Permanent
Nominal exchange rate	1.5%	0.2%	5.9%	0.2%	5.7%	0.4%	11.8%
Real exchange rate	1.2%	0.2%	4.7%	1.0%	5.3%	1.6%	10.2%
Terms of trade	0.9%	1.0%	4.3%	−0.1%	3.2%	0.9%	7.6%
Producer import price	1.2%	0.2%	4.7%	−0.01%	4.3%	0.2%	9.3%
Consumer import price	0.6%	0.1%	2.4%	−0.5%	1.7%	−0.4%	4.1%
CPI	0.2%	−0.1%	0.5%	−0.8%	−0.2%	−0.8%	0.3%
ERPT ξ							
Producer import price $\xi_{\tilde{P}_{Ft},\mathcal{E}_t}$	0.80	0.81	0.82	−0.06	0.76	0.36	0.78
Consumer import price $\xi_{P_{Ft},\mathcal{E}_t}$	0.40	0.41	0.35	−2.20	0.30	−0.99	0.35

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- *Movements in markup reflecting optimal destination-specific adjustment by firms* **(Pricing to Market PTM)**
  - Imperfect pass-through: **the elasticity of demand is increasing in import (border) prices** (e.g., see Marston [1990])
- *Nominal (information?) rigidities constraining price adjustment in local currency*

$$\text{ex-post markup} = \overbrace{\overline{p}\left(f\right)}^{\text{sticky}} / \mathcal{E}_t \cdot MC_t^*.$$

EPRT is incomplete when import border prices are sticky in local currency.

What determines markup adjustment?

Complex question, but rough distinction across types of models helpful

1. **'horizontal' competition** by producers of close substitutes
   - (as in Akteson and Burstein AER 2008)
2. **'vertical interactions'** by monopolistic upstream firms with downstream producers or distributors
   - (as in Corsetti and Dedola JIE 2005)

Horizontal competition by producers of close substitutes

Well known example with 'limit pricing':

- Heterogenous productivity (or heterogeneous trade costs) among firms.
- In each market, only the firm with the lowest marginal costs will be producing.
  - If incumbent firm has a large marginal costs advantage over the second-most-productive firm, incumbent able to charge optimal markup and pass through MC^* shocks completely
  - Otherwise, incumbent has to adjust markup, to prevent entry by the less productive competitor.

Empirical implications

- Pass through lower where cost differentials small and less barrier to entry
  - change structurally with tariff reduction and emerging market product development
- Pass through higher with shocks that move $\mathcal{E}$ symmetrically across currencies, affecting costs of all competing exporters
  - see recent work by Auer and Schoenle (2012 +)
  - key to read FHN results: pass-through is higher conditional on monetary and 'global' shocks.

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a constant-elasticity of substitution demand for good f looks like:

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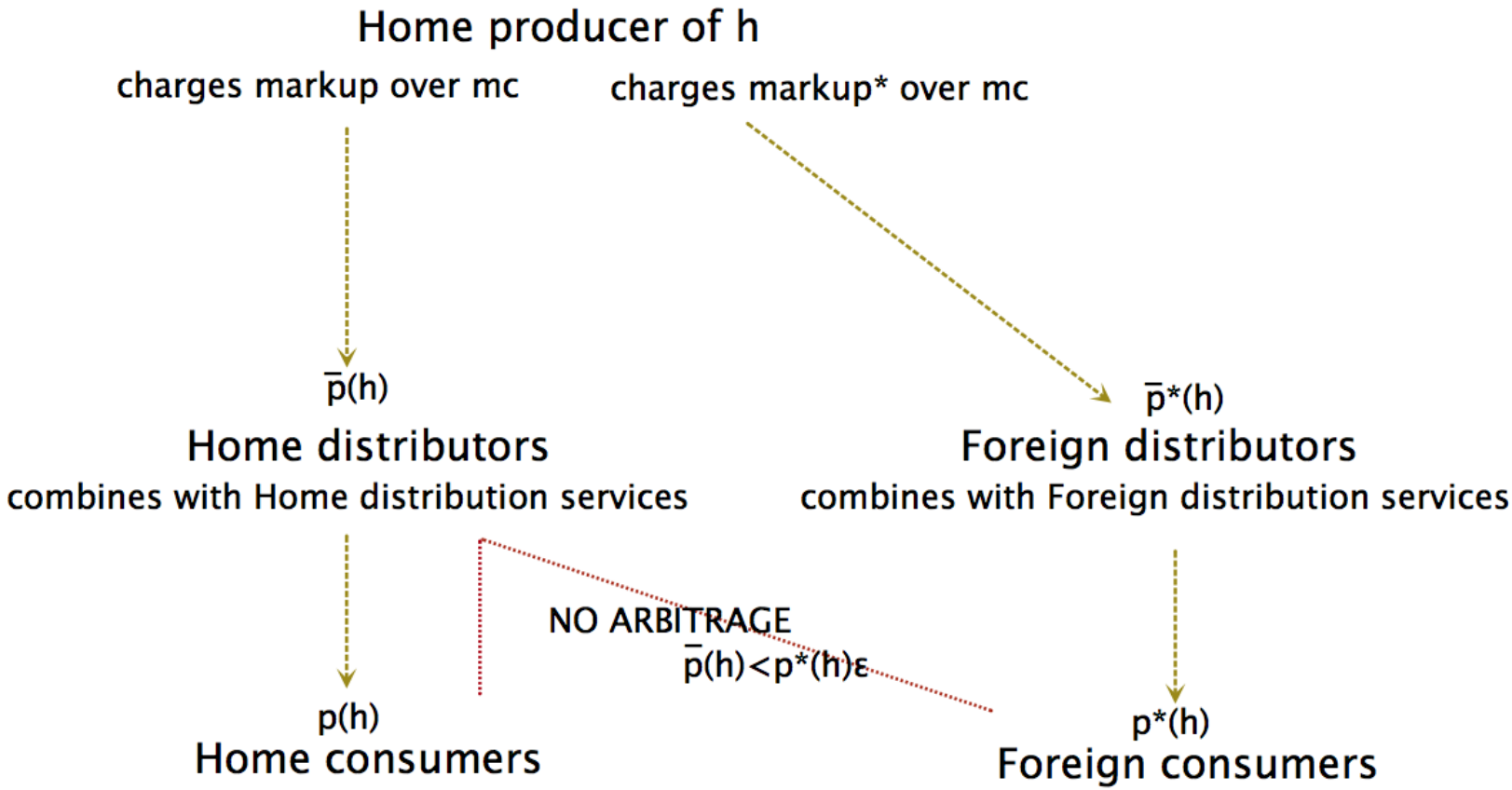
- Price elasticity of demand not constant, but lower than θ and increasing in the supply price (hence incomplete pass-through)

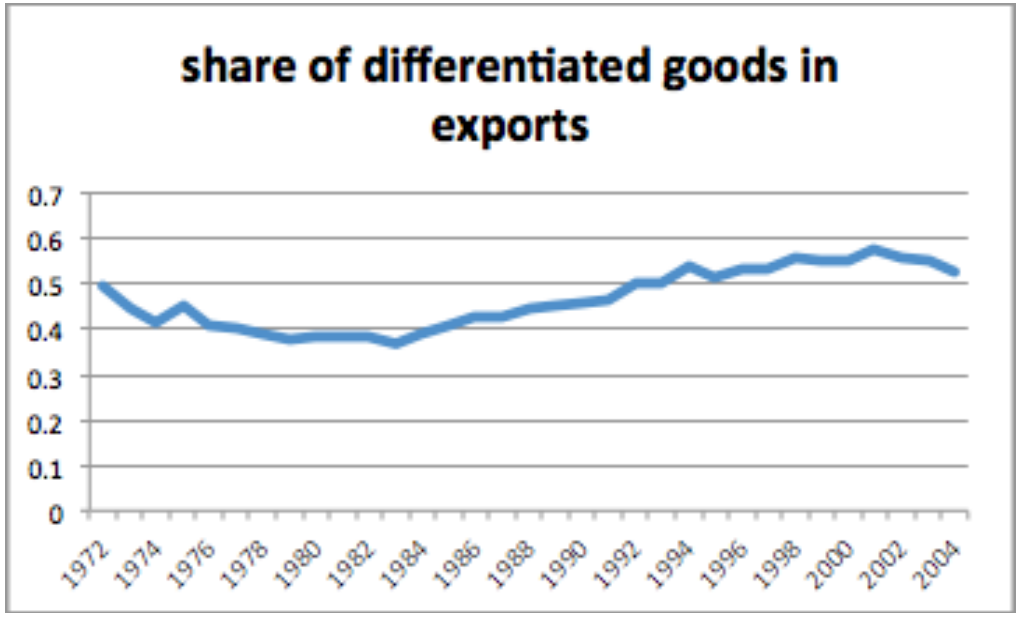
$$\zeta_{C_t(f),\bar{p}_t(f)} \equiv -\frac{\partial C / C}{\partial p(f) / p(f)} = \theta \frac{\bar{p}_t(f)}{\bar{p}_t(f) + LCost_t} < \theta$$

Distribution cost model



EPRT with vertical interactions (distribution, supply chain)

Large increase in manufacturing differentiated goods:



- Empirical evidence on the model: Berman Martin and Mayer QJE (2012)

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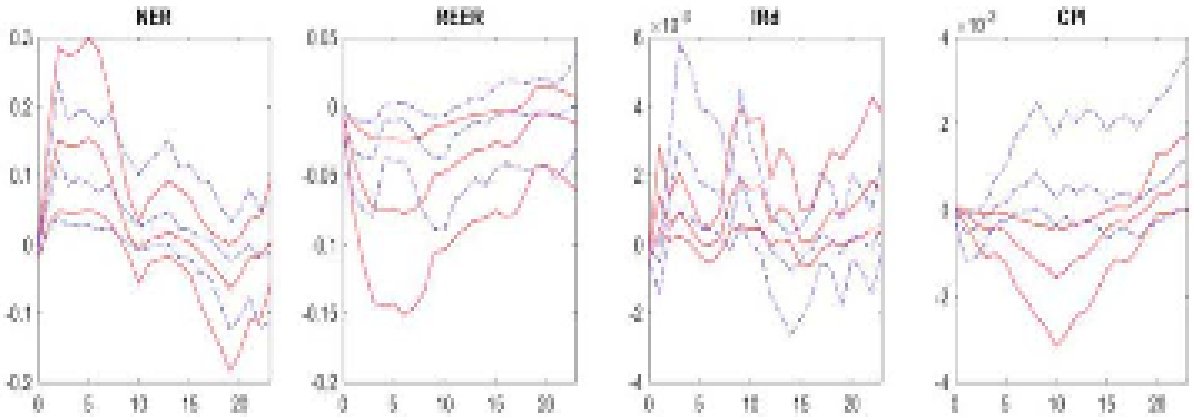
  - strategic substitutes/complements

Pass through not independent of monetary/stabilization regime

LCP and PCP choice at the margin influenced by stabilization policy Corsetti and Pesenti 2002

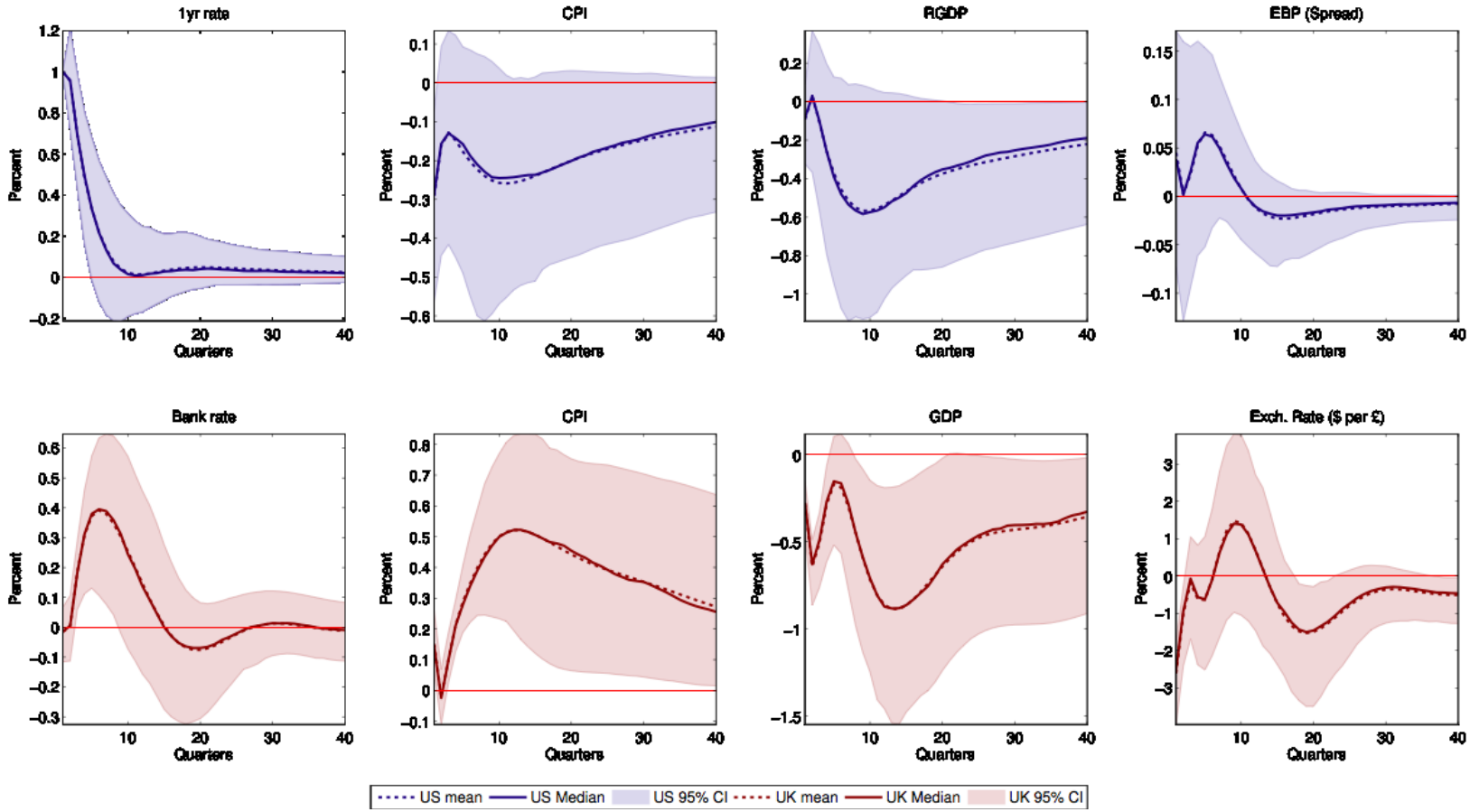
A lingering question: global inflationary effects of US monetary shocks

Dedola Rivolta and Stracca ECB wp (2015) (but also Mackowiak JME 2007): the response of selected variables in Advanced Economies (solid red) and Emerging Market Economies (dotted blue) to a U.S. contractionary monetary shock (nominal and real exchange rates, interest rates, and CPI)



Close-up analysis of the UK

Similar methodology as DRS (Cesa-Bianchi, very preliminary), inflationary impact!



Conclusions

- Towards a world with large capital flows (portfolio) and exchange rate adjustment
- Inflationary impact key to understand trade-offs faced by policymakers
- FHN paper stresses all the relevant chords to avoid logical traps
- Correct direction of policy-relevant research
  - not necessarily easy