

# “Microeconomic Sources of Real Exchange Rate Variability”

By Mario J. Crucini and Chris Telmer

Discussed by Morten O. Ravn

# THE PAPER

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Crucini and Telmer find that

- (a) The cross-sectional variance of LOP level violations is large relative to the time-series variation
- (b) The variation of changes in LOP violations is dominated by idiosyncratic shocks rather than common location-pair specific variation
- (c) Nominal exchange rates correlate closely with the country-specific variation

They conclude that nominal exchange rates play only a minor role for relative prices – there's a lot more action within the distribution of relative prices than in its mean.

# THE DATA

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Data on

- Price levels
  - Of individual goods (up to 300)
  - In multiple countries / cities (123 locations)
- Annual, time-series dimension (1990-2005)

This is a very interesting dataset. Allows one to investigate the determinants of absolute price level differences and convergence to the absolute version of the LOP.

# THE PAPER

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Crucini has earlier worked on this data in:

Crucini, Telmer and Zachariadis, *AER* 2005:

- Roughly as many underpriced as overpriced goods between any two EU countries
- LOP violations greater for non-traded goods than for traded goods and for goods with large inputs of non-traded inputs

Crucini and Shintani, 2006:

- Half-life of LOP violations around 1.2 year for traded goods and 1.9 years for non-traded goods

# The Results

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Crucini and Telmer define LOP violation as:

$$q_{i,jk,t} = \log\left(\frac{P_{ij,t} S_{jk,t}}{P_{ik,t}}\right)$$

The logarithm of the price of good  $i$  in location  $j$  at date  $t$  converted into currency  $k$  divided by the price of good  $i$  in location  $k$  at date  $t$

And they decompose the total variance as:

$$\text{var}(q_{i,jk,t} | i) = \underbrace{\text{var}_{jk} \left( E_t [q_{i,jk,t} | i, jk] \right)}_{T_i} + \underbrace{E_{jk} \left( \text{var}_t (q_{i,jk,t} | i, jk) \right)}_{F_i}$$

# The Variance Decomposition

Table 2  
Variance in Absolute LOP Deviations: Traded Goods

	Total	Cross Sectional	Time Series	Cross Sectional Total
U.S.	0.122	0.063	0.064	0.517
Canada-U.S.				
Combined	0.133	0.070	0.068	0.525
International	0.121	0.051	0.076	0.419
Intranational	0.122	0.063	0.064	0.514
OECD				
Combined	0.209	0.135	0.079	0.646
International	0.215	0.140	0.081	0.649
Intranational	0.116	0.060	0.061	0.513
World				
Combined	0.266	0.184	0.088	0.692
International	0.271	0.188	0.089	0.693
Intranational	0.112	0.057	0.059	0.508

# The Variance of Changes in LOP Violation

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Crucini and Telmer then look at the variance of changes in LOP violations:

$$\Delta q_{i,jk,t} = f_{jk,t} + \varepsilon_{i,jk,t}, f_{jk,t} \perp \varepsilon_{i,jk,t}$$

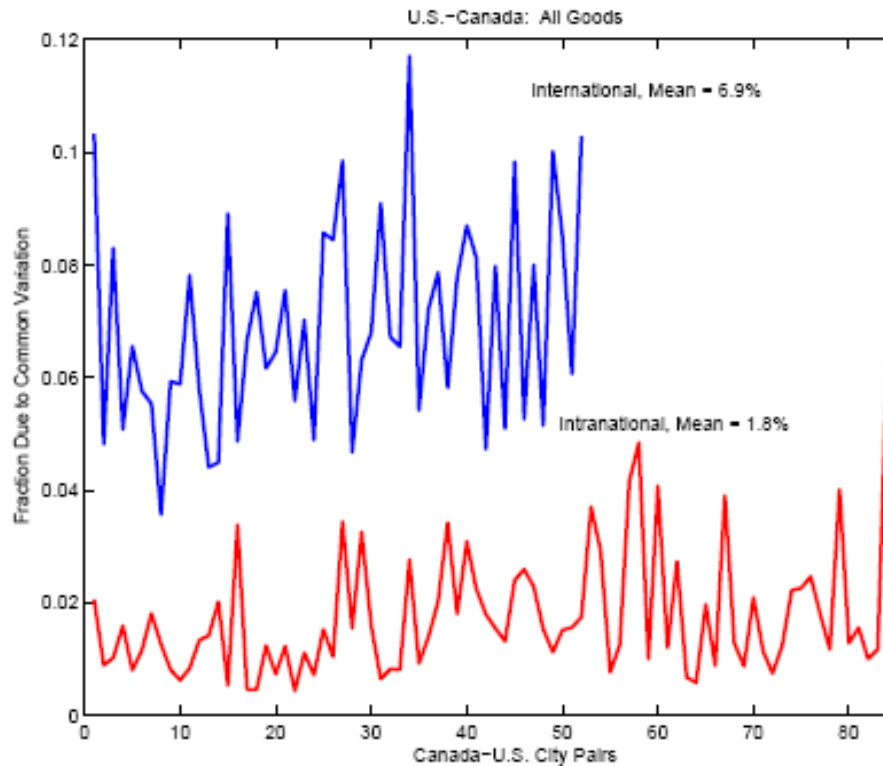
They compute the common component as:

$$f_{jk,t} = E_i(\Delta q_{i,jk,t} \mid jk, t)$$

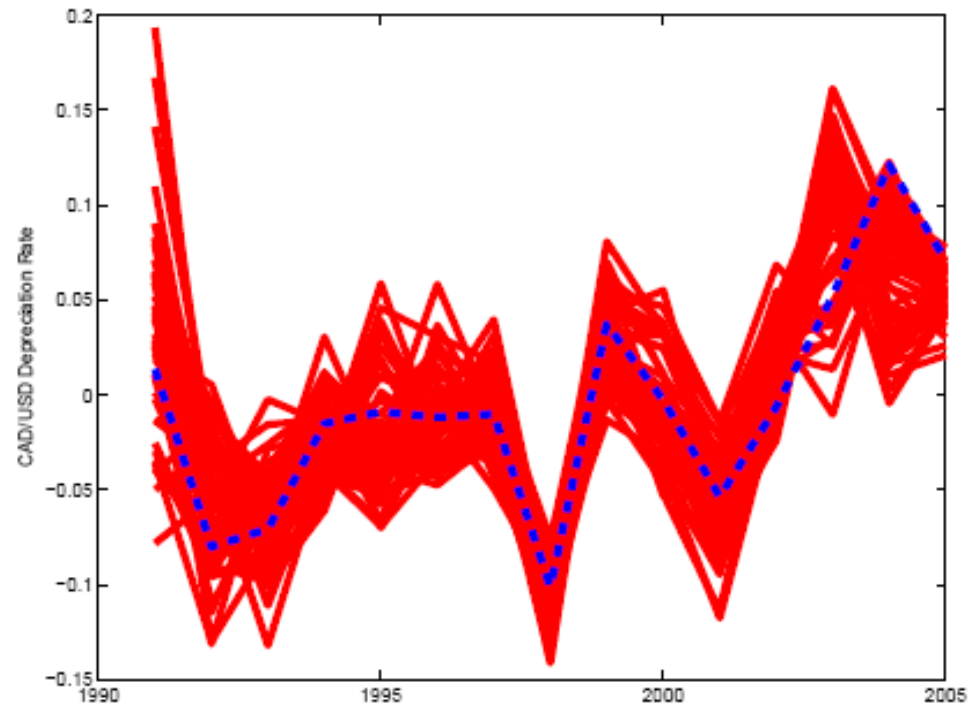
And they examine the common component's contribution to the overall variance of the changes in LOP violations

# The Common Component

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The common component is small



but strongly correlated with  
NER



# Comments

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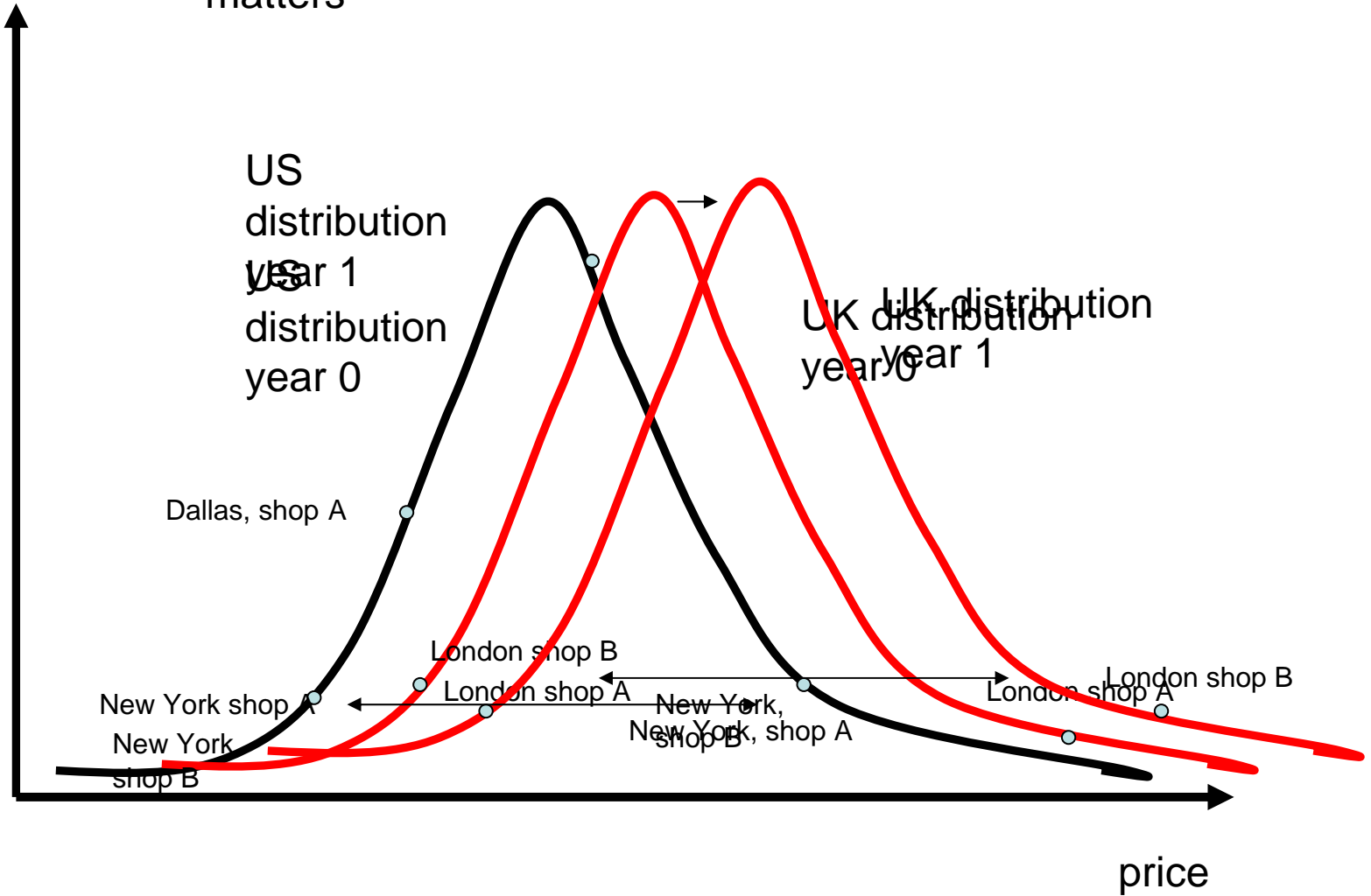
## 1. Trade vs. Macro.

Crucini and Telmer find that there is lots of cross-sectional variation in deviations from the absolute version of the LOP.

- They claim that this implies that “trade theory” is more important than “macro” for understanding relative prices
- It’s tempting to agree ... but does this conclusion really follow from the results?
- Could their results simply be due to sampling uncertainty?

Sampling uncertainty will make the econometrician conclude in favor of trade over macro but macro is the only thing that matters

frequency



# Comments

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2. The importance of exchange rates / sticky prices:

Is the following true?

Fact: Lots of idiosyncratic changes in LOP violations

(a) Implies that

“If you think that annual real exchange rate variability is indicative of nominal exchange rates moving around a distribution of microeconomic sticky prices, you are wrong.”

(b) Which implies that

Nominal exchange rates matter little?

I'm not sure about neither (a) nor (b).

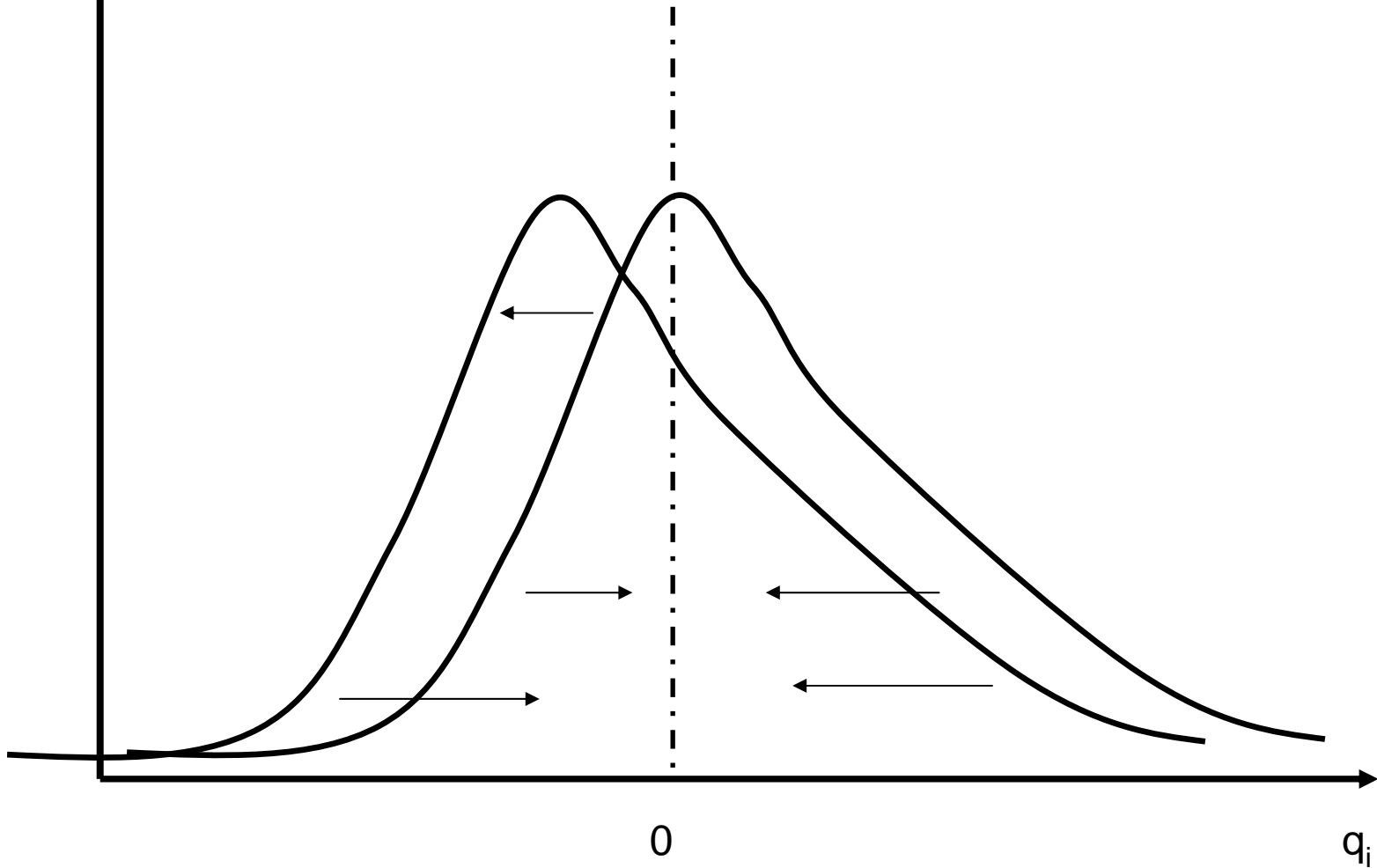
# Counterexample

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Take a “textbook” model of sticky prices (Calvo staggering, for example).

- this model with display price dispersion in equilibrium
- suppose that the only reason by prices differ across locations is that prices are sticky
- would this model necessarily say that “the common component” (the exchange rate) should dominate the cross-sectional changes in relative prices?

The exchange rate shock has shifted the distribution but there are still large idiosyncratic movements due to past shocks.



# Comments

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So, how could we check the extent to which exchange rates matter?

I think the right question is:

“If the nominal exchange rate changes by  $x\%$ , the real exchange rate changes by  $y\%$  over a horizon of  $z$  periods” – in other words a sort of ERPT regression.

The results of Crucini and Telmer do not answer this question – the fact that there are many other variations in relative prices doesn't mean that nominal exchange rates are not important.

In fact, the covariance between changes in LOP violations and NERs might be reasonably high – perhaps the evidence does not so strongly go against sticky prices?

# Things I would have liked to see

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The data are very interesting – price level data for a large no. of countries and a longish sample.

I would have liked to know:

- which economic forces affect the fixed effect (the long run difference in prices)?
- which economic forces affect the adjustment in prices?
- in response to shocks, do prices tend to revert towards the LOP?
- do price differentials tend to get smaller over time?

## Other comments

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- 1) What happens in large devaluations? Does the whole distribution of prices change?
- 2) The common component – the authors simply average prices cross-sectionally to get the common component – is this appropriate?
- 3) Can the data be made available, please?



# Summary

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The work of Crucini on the topic of the LOP is extremely important – I look forward to more!

- I have tried to be the devil's advocate, but at the end of the day, I think that their results are pretty convincing.