Discussion of "International Inflation Spillovers Through Input Linkages", by Auer, Levchenko, and Saure

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Accounting for international comovement of producer prices

- ► Price = Markup x (Interm. inputs + value added costs)

- ► International comovement of prices through:
    1. correlated costs
        a. value added (e.g. wage, productivity, etc)
        b. large share of traded intermediate inputs
            - ► similar intuition to CPI-based RER smoother than ToT
    2. correlated markups

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- ▶ This paper: tease out a. from b.

    - ▶ without using information on cost changes

    - ▶ data for 30 countries, 17 tradeable industries

Simple representative industry example

- Log changes in marginal costs in producer currency:

$$w_{in} = w_i = \gamma_i^c c_i + (1 - \gamma_i^c) \sum_{i'} [\gamma_{i'i}^m p_{i'i}]$$

- Changes in prices in importer's currency

$$p_{in} = \beta_{in} (w_i + e_{in})$$

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- Given $\{\gamma_i^c, \gamma_{in}^m\}$, β_{in}, spillover $c_i \to w_n$ (Johnson & Noguera)
- Suppose $ppi_i = \beta_{ii} w_i$, given $\{ppi_i, e_{in}\}$, back out $\{c_i\}$
  - Finding: correlation btw ppi_i, ppi_n < correlation btw c_i, c_n

International comovement of local currency prices?

- ▶ Key object of interest in this paper:
  - ▶ correlation between prices in local currency ppi_i, ppi_n

- ▶ Key object of interest in international macro:
  - ▶ real exchange rates: $ppi_i + e_{in} - ppi_n$
  - ▶ RERs very different to ratio of nominal prices (e.g. Mussa 86)

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- ▶ Many models (e.g. IRBC) pin down RERs
  - ▶ nominal P (similarly, exch. rates) pinned down by e.g. M policy

- ▶ Redo analysis focusing on prices measured in common currency
  - ▶ "Exchange rate movements play no role in synchronizing inflation across countries"?

Cost and exchange rate pass-through

- Changes in prices in importer's currency

$$p_{in} = \beta_{in} (w_i + e_{in})$$

- $\beta_{in} = 1$ simple benchmark but clearly violated in data
  - large deviations from relative PPP
  - terms of trade less volatile than PPI-based RER

- Sensitivity to $\beta_{in} = \beta$. Low β reduces importance of intermediate inputs for PPI correlation

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- In a class of pricing models, log change in mkup

$$mkup_{in} = -\Gamma_{in}(p_{in} - p_n)$$

implies

$$p_{in} = \frac{w_i + e_{in}}{1 + \Gamma_{in}} + \frac{\Gamma_{in}}{1 + \Gamma_{in}} p_n$$

    - ERPT depends on p_n, supported in data (e.g. Auer and Schoenle, Amiti et. al)

Incomplete pass-through and PPI

- ▶ Key assumption:
  - ▶ change in PPI = $\beta_{ii} \times$ change in marginal cost

- ▶ Implicit assumption: PPI includes only prices of goods sold domestically

- ▶ But in some countries (e.g. US), PPI include export prices
  - ▶ Link between PPI and change in marginal cost depends on all exchange rate movements

Data on marginal costs

- Changes in markups difficult to measure in general (central I.O. question)

- Complement analysis with available international (imperfect) measures of marginal costs
  - e.g. unit labor costs (wage / productivity)

- Back of the envelope calculation
  - correlation $(ppi_i + e_{iUS} - ppi_{US}, ulc_i + e_{iUS} - ulc_{US})$
  - stdev $(ppi_i + e_{iUS} - ppi_{US})$ / stdev $(ulc_i + e_{iUS} - ulc_{US})$

PPI and unit-labor-cost based US-bilateral RER

	Australia	Belgium*	Canada	Denmark	France	Germany*
Time Period	1991-2011	1981-2011	1981-2011	1986-2011	1996-2011	1981-2011
Correlation	0.95	0.96	0.86	0.94	0.93	0.90
Ratio of Standard Deviations	0.92	1.09	0.97	0.89	0.99	0.92

	Italy*	Netherlands	Norway*	Spain	Sweden	United Kingdom*
Time Period	1992-2011	1991-2011	1981-2011	1981-2011	1983-2011	1997-2011
Correlation	0.94	0.96	0.87	0.93	0.82	0.89
Ratio of Standard Deviations	0.94	1.09	0.99	1.16	1.07	0.92

* Domestic PPI