Discussion: How Important are Trade Prices for Trade Flows?

by Logan T. Lewis, Federal Reserve Board

discussed by Philip Sauré, SNB*

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* Swiss National Bank. The views are the author’ and do not necessarily reflect those of the SNB.
Observation: the value of trade flows respond little to exchange rate changes (in the short run).

Suspect: sticky prices - if prices do not respond to exchange rates, trade values will not.

Objective: match response of US import and export values with a model that accounts for adjustment frequencies of nominal border prices.
Summary: motivation and question

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Summary: the built-in problem

The US as a special case:

The fact that 90% (97%) of US imports (exports) are priced in dollars (Gopinath and Rigobon 2008) generates a fundamental asymmetry:

- local currency pricing (LCP) for imports
- producer currency pricing (PCP) for exports

Strong nominal price rigidities thus imply that exchange rate changes induce...

- no immediate change in border prices of US imports
- large immediate changes in border prices of US exports
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Summary: Theory

Model ingredients:

- For partial pass-through: variable markups, complementarities in price setting, imported intermediates

Kimball-type demand

\[ q(p) = \left[1 - \varepsilon \ln(p/P)\right]^{\theta/\varepsilon} \]  

Production costs

\[ c(e, a) = e^\phi / a \]

- For transition period: menu costs, Calvo calls
Summary: regression results

The value of US trade flows in response to a 1% exchange rate appreciation; estimated (pooled regressions) and modelled.

5.1 Price stickiness

The distinction between flexible, state-dependent (menu cost), and time-dependent (Calvo) pricing is dramatic in terms of the value of trade, a result that echoes the closed-economy literature regarding the response of output to monetary policy shocks.23 The central reasoning is similar: a strong selection effect occurs under menu cost pricing, where the firms that most need to adjust their price will; with a time-invariant menu cost, this leads firms to not stray far from their profit-maximizing price.

Here, I consider two extreme cases of the selection effect: the time-invariant menu cost model where the selection effect is very strong, and a Calvo pricing model where the selection effect is essentially eliminated. Modeling techniques such as multi-product firms, stochastic menu costs, etc. that help reduce the selection effect can generally be seen as some combination of these extremes.

Figure 1: Impulse responses to 1% exchange rate appreciation for pooled HS4 categories with baseline model results

Consider the results of estimating (8) pooled across HS4 sectors. Rather than presenting the regression results in table form, it is easier to consider the implied impulse responses for horizon $h$.
Summary: regressions result

Disaggregation along the model’s key dimensions

- strategic complementarities (market shares)
- elasticities (Broda-Weinstein; Rauch)
- share of imported intermediaries
- differences in price stickiness

reveals that the data (or the model) does not deliver what it should.

This is discomforting: the factors that we know matter for the ERPT do not seem to matter for volumes.
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This is discomfoting: the factors that we know matter for the ERPT do not seem to matter for volumes.
Assessment

Next,...

- ...take a fresh look at the puzzle.
- ...consider two possible explanations:
  - difference between border prices and consumer prices.
  - possible biases of estimates.
Assessment: fresh look at main result

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Is the main concern really the transition period?
Any price rigidity with only transitory effects will have problems in matching levels.
Changes that fix the long-run (flex price equ.) level may make the short-run look better.
Assessment: fresh look at main result

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<table>
<thead>
<tr>
<th>Imports</th>
<th>Exports</th>
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<tbody>
<tr>
<td>Percent</td>
<td>Percent</td>
</tr>
<tr>
<td>Quarters</td>
<td>Quarters</td>
</tr>
<tr>
<td>-0.5</td>
<td>0</td>
</tr>
<tr>
<td>0</td>
<td>-0.5</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
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<tr>
<td>1</td>
<td>1.5</td>
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Figure 1: Impulse responses to 1% exchange rate appreciation for pooled HS4 categories with baseline model results

Consider the results of estimating (8) pooled across HS4 sectors. Rather than presenting the regression results in table form, it is easier to consider the implied impulse responses for horizon $h$ share of related-party trade have a similar trade response as other sectors.

23For a detailed discussion of this in a closed-economy context, see Midrigan (2011).

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Data associated with flexible, menu cost, and Calvo pricing models are shown. Flexible pricing results in a sharp initial response, followed by slow convergence to zero. Menu cost pricing yields a more gradual response, while Calvo pricing produces a flat line indicating minimal change.

Imports
Exports

Quarters
Percent

Data

Prices

Quarters
Percent

Data

Prices

Percent

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Assessment: border vs consumer prices

HOW?

The paper tacitely assumes that border prices are consumer prices (ultimate buyer prices). But the price chain is longer.

\[ p_{\text{producer}} \rightarrow p_{\text{border}} \rightarrow p_{\text{consumer}}. \]

- there are more layers of nominal rigidities than the one affecting border prices.
- consumer prices are denoted in local currency.
- alternative benchmark: total stickiness to all nominal prices (Gopinath 2015: "prices in their currency of invoicing are not very sensitive to exchange rates at horizons of up to two years.")
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Sticky consumer prices in local currency.

**Totally rigid consumer prices**

Brainless! But: every effect that mutes reaction of consumer prices will improve the model’s performance.
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Wedges between border and consumer prices.

- Local distribution costs.
  - Burstein et al 2003: "distribution costs are very large [...] more than 40% of the retail price in the US and roughly 60% [...] in Argentina.
  - Lewis 2016: "local distribution costs cannot sufficiently explain [that] import prices at the dock do not pass through changes in the exchange rate". But they may nevertheless be important for volumes.
Assessment: border vs consumer prices

Once the level is fixed, turn to transition...

- The nature of prices rigidities differs.
  - Cross-border contracts specify prices and quantities.
  - Consumer price rigidities affect prices only (leaving quantities to adjust).

- Other factors of transition dynamics:
  - Consumers’ habits / inattentive purchasers can mute initial quantity effects and delay pass-through to consumer prices.
  - Time-intensive costs of entry generate delayed responses.
Assessment: estimated exchange rate elasticities

Potential biases in the standard ERPT regression at the monthly levels:

\[ \Delta(tv_{k,t}) = \alpha_k + \sum_{m=0}^{T} \beta_m \Delta(e_{t-m}) + X_{k,t} \gamma + \varepsilon_{k,t}, \]  

(3)

- standard attenuation bias due to measurement of exchange rate (end of month, average monthly, forward?)

My guess: not likely to solve the puzzle.
Estimated exchange rate elasticities: Swiss view

EURCHF shock in January 2015: unanticipated and exogenous to firm pricing.
Estimated exchange rate elasticities: Swiss view

**Fast ERPT into on import unit values (daily scale!).**

### Daily reaction of import unit values

**EUR invoiced**

<table>
<thead>
<tr>
<th>Date</th>
<th>Log Change</th>
</tr>
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<tbody>
<tr>
<td>16 Jan 2015</td>
<td>-2</td>
</tr>
<tr>
<td>31 Jan 2015</td>
<td>-1.5</td>
</tr>
<tr>
<td>14 Feb 2015</td>
<td>-1</td>
</tr>
<tr>
<td>28 Feb 2015</td>
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**CHF invoiced**

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**Legend:**
- **daily dummies**
- **eurchf log-diff. with Jan15**
- **following months**
Nevertheless, the response in import flows was weak.
Overall, this paper...

- is well-written with a "we have a problem" message: sophisticated models for pricing don’t match volumes.
- should account for the step $P_{\text{border}} \rightarrow P_{\text{consumer}}$ to strengthen its focus.
- reminds us that there is action behind the border, which may actually impact cross-border pricing strategies.
- shows us that we should think about reasons of sluggish quantity response to prices adjustments (J-curve literature).
- should strengthen the disaggregated regression results (currently like robustness checks): are effects of border prices offset by differences in distribution costs; relation of stickiness at border / in shop;....
THANK YOU!