

Discussion of Zhi Yu (2012), "Exchange Rate Pass-through, Firm Heterogeneity and Product Quality"

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June 21-22, 2012
Conference on International Linkages in a Globalized World and
Implications for Monetary Policy

Outline of discussion

- 1 Brief review of research on exchange rate pass-through
- 2 Summary of the model predictions
- 3 Comments
- 4 Conclusion

Literature review of exchange rate pass-through (ERPT) I

ERPT is defined as the percentage change in local currency import prices resulting from a one percentage change in the exchange rate between the exporting and importing country.

1 The low degree of ERPT has been extensively documented.

- incomplete ERPT for aggregate and disaggregated (sector- and good-levels) prices; for wholesale and retail prices.
- variation in the degree of ERPT between aggregate and disaggregated (wholesale and retail) prices; across countries, sectors or goods; for different time horizons.
- e.g., Bacchetta and Wincoop (2003); Campa and Goldberg (2005); Gopinath and Rigobon (2008).

2 Determinants of (the low degree of) ERPT have been studied.

1 Macroeconomic explanations

- importance of monetary policy; price stickiness
- e.g., Taylor (2000); Devereux, Engel and Storgaard (2004); Devereux and Yetman (2010); Gopinath and Rigobon (2008).

Literature review of exchange rate pass-through (ERPT) II

2 Microeconomic explanations

- pricing-to-market by imperfectly competitive firms; distribution sector for imported goods and non-traded goods components in consumption
- e.g., Goldberg and Knetter (1997); Burstein, Eichenbaum and Rebelo (2003); Corsetti and Dedola (2005).

3 Gopinath and Itskhoki (2010)

- They develop a dynamic menu-cost model that incorporates variable markups and imported inputs as two standard sources of incomplete ERPT.
- The model explains well a relationship between slow price adjustment and low ERPT observed in the (U.S.) data.

What questions does this paper address?

This paper attempts to explore (potentially possible) **variation in the degree of ERPT among heterogeneous firms in terms of both productivity and product quality level differences.**

1 Theoretical part

- The theoretical model is based on Melitz and Ottaviano's (2008) trade model with firm heterogeneity in terms of different productivity: **variable markups.**
- It also introduces additional heterogeneity in terms of different levels of product quality as an extended version of Antoniadis (2008): **variable quality component.**
- So, these two variable components are now sources of variation in the degree of (incomplete) ERPT across heterogeneous firms.
- **The model prediction is that the degree of ERPT to export prices is**
 - 1 **positively** associated with firm productivity **for products that are quality-homogeneous.**
 - 2 **negatively** associated with firm productivity **for products that are quality-differentiated.**

2 Empirical part

- The author considers Chinese exporting firms. The empirical study is proposed, but its results are not available at the current stage of the research.

Model prediction on variation in the degree of ERPT I

- The home export price set in the foreign currency by a home firm with its productivity level of c , p^{hf} , can be expressed when substituting out the level of quality upgrading z^{hf} for its good sold in the foreign market:

$$\begin{aligned}
 p^{hf} &= \frac{e}{2}(c^{hf} + c) + \underbrace{\left(\frac{\gamma+eb}{2}\right)e\lambda^{hf}(c^{hf} - c)}_{= z^{hf}} \\
 &= \underbrace{\frac{e}{2}(c^{hf}(e) + c)}_{\text{from quantity processing}} + \underbrace{\left(\frac{\gamma+eb}{2}\right)e\lambda^{hf}(e)(c^{hf}(e) - c)}_{\text{from quality upgrading}} = p^{hf}(e, c),
 \end{aligned}$$

where the upper bound cost for home exporters to the foreign country c^{hf} and a defined variable λ^{hf} are functions of e only, given model parameters, respectively.

- Note that the condition, $\frac{\partial c^{hf}(e)}{\partial e} < 0$, holds. That is, all else equal, the home currency appreciation lowers the upper bound cost for home exporters to the foreign country (in other words, makes more productive home firms become exporters), leading to higher average productivity.

Model prediction on variation in the degree of ERPT II

- Now, the home export price in the home currency, $p(e,c) = \frac{p^{hf}(e,c)}{e}$, is expressed as:

$$\begin{aligned}
 p(e,c) &= \underbrace{\frac{1}{2}(c^{hf}(e)+c)}_{\text{from quantity processing}} + \underbrace{\left(\frac{\gamma+eb}{2}\right)\lambda^{hf}(e)(c^{hf}(e)-c)}_{\text{from quality upgrading}} \\
 &= c + \underbrace{\frac{1}{2}(c^{hf}(e)-c)}_{\text{variable markup component}} + \underbrace{\left(\frac{\gamma+eb}{2}\right)\lambda^{hf}(e)(c^{hf}(e)-c)}_{\text{variable quality upgrading component}} \\
 &= \boxed{mu(e,c)} + \boxed{qu(e,c)}
 \end{aligned}$$

Note that the following conditions hold:

- (i) $\partial p(e,c)/\partial e < 0 \quad \because \quad \partial mu(e,c)/\partial e < 0; \quad \partial qu(e,c)/\partial e < 0$
- (ii) $\frac{\partial |\partial p(e,c)/\partial e|}{\partial(1/c)} > 0 \quad \because \quad \frac{\partial |\partial mu(e,c)/\partial e|}{\partial(1/c)} = 0; \quad \frac{\partial |\partial qu(e,c)/\partial e|}{\partial(1/c)} > 0$

Model prediction on variation in the degree of ERPT III

- Given the previous expression of $p(e, c)$ and derived conditions, **the ERPT to export price is negative:**

$$\Phi(e, c) = \frac{\partial p(e, c)}{\partial e} \frac{e}{p(e, c)} < 0$$

- Then, **the response of the absolute value of the ERPT to export price w.r.t. firm's productivity depends on "primitives that determines whether goods produced by firms are quality-homogeneous or quality-differentiated":**

$$\frac{\partial |\Phi(e, c)|}{\partial (1/c)} > 0, \quad \text{if } \left(\frac{2\theta}{L^f} + b \right) e > \gamma$$

$$\frac{\partial |\Phi(e, c)|}{\partial (1/c)} < 0, \quad \text{if } \left(\frac{2\theta}{L^f} + b \right) e \ll \gamma$$

where $\left(\frac{2\theta}{L^f} + b \right) e > \gamma$ ($\left(\frac{2\theta}{L^f} + b \right) e \ll \gamma$) means that goods are quality-homogeneous (quality-differentiated). In particular,

- (θ, b) are parameters for quality upgrading costs; large values means high costs.
- γ is one of the preference parameters that indexes the degree of product differentiation between the varieties; small value means lower degree of product differentiation.

Comments: This paper could be very interesting! I

- Need to provide the empirical results that support the model predictions.

- The proposed Chinese export and production dataset (yearly observations from 2004 and 2006) seem to be too short.
 - When converting export prices in US dollars to ones in RMB, the nominal exchange rate is used. And, the analysis is done using the nominal exchange rate.
 - But, China switched from a fixed exchange rate regime to a managed floating one in June 2005.
 - Can we consider the period before June 2005?

- Pay more attention to dataset.
 - It could be the case that a large portion of export prices actually never change during the sample period.
 - Using different data sources, matching firms, export prices of goods and product quality scope might not be a easy task.
 - When estimating firms TFP series, you can use production data for all years available.

Comments: This paper could be very interesting! II

- The theoretical analyses rely on steady state comparisons, so the results derived are likely to be interpreted as capturing the long run consequences.
 - However, the proposed empirical strategies seem to capture short run phenomena.
- Previous studies indicate that China's export prices invoiced in US dollars are quite sticky.
 - For instance, Kim, Nam, Wang and Wu (2011) use U.S. BLS dataset on US-China import/export prices, and find that significant price stickiness exists for US imports from China (even if there is a decline in such price stickiness after June 2005).
 - As a consequence, movements in export prices in RMB, which are converted from export prices in US dollars, might reflect movements in the nominal exchange rate itself.
 - This might make it difficult to find empirical evidence in support of the model predictions.

Conclusion

- A very interesting study on a relationship between the degree of ERPT and firm heterogeneity.
- Hopefully, empirical results in support of the model predictions will be provided at a future stage of the research.