Risk, Returns, and Multinational Production

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Discussion
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2' Summary

- *Very* nice paper.

- José and Stefania begin by establishing some empirical facts relating financial market performance to firm status in international activity:
  - Multinationals exhibit higher stock market prices, returns, and earning yields than non-multinationals.
  - Within non-multinationals, exporters exhibit higher stock market prices, returns, and earning yields than non-exporters.

- José and Stefania explain this evidence by developing a partial equilibrium, dynamic model in which firms with heterogeneous productivity decide whether to serve only the domestic market, export, or serve the foreign market through FDI.

- The model builds on Melitz (*Econometrica*, 03) and Helpman, Melitz, and Yeaple (*AER*, 04) by assuming that firms face sunk export entry or FDI costs, with the latter larger than the former.

2' Summary, Continued

- Big step forward: A fully dynamic model that merges this trade literature with results on dynamic entry/exit/investment decisions under uncertainty developed by Dixit (*JPE*, 89) and Dixit and Pindyck (94).

- José and Stefania show that sorting by productivity (most productive firms do FDI, next in the ranking export, least productive sell only domestically) allows the model to replicate the facts above.

- Moreover, sunk costs and fixed continuation costs generate empirically plausible hysteresis and non-linearity in entry-exit decisions in and out of export or FDI status.

- My comparative advantage is not empirical work.
  - I found José and Stefania's results convincing.

- So, I will focus on the model, and I will begin by relating José and Stefania's framework to some recent literature at the intersection of international trade and macroeconomics.

José, Stefania, and Some Recent Literature

- I will use a tool I am familiar with: Ghironi and Melitz (*QJE*, 05).

- From Melitz trade model:
  - Productivity differs across individual, monopolistically competitive firms in each country.
  - Firms face some initial uncertainty concerning their future productivity when making an irreversible investment to enter the domestic market.
  - In addition to the sunk entry cost, firms face both fixed and per-unit export costs.
  - Forward-looking firms formulate entry and export decisions based on expectations of future market conditions.
  - Only a subset of relatively more productive firms export, while the remaining, less productive firms only serve their domestic market.

- We embed this in DSGE framework where number of firms $=$ capital stock, creation of new firms $=$ investment, time varying price of capital $=$ stock market value of a firm.

- We have fun with Balassa-Samuelson and IBC properties...

José, Stefania, and Some Recent Literature, Continued

- In our notation:

  Average productivity for all producing firms in each country: $\tilde{z}_D \equiv \left[\int_{z_{\min}}^{\infty} z^{\theta-1} dG(z)\right]^{\frac{1}{\theta-1}}$,

  Average productivity for all home exporters: $\tilde{z}_{X,t} \equiv \left[\frac{1}{1-G(z_{X,t})}\int_{z_{X,t}}^{\infty} z^{\theta-1} dG(z)\right]^{\frac{1}{\theta-1}}$.

- $\Rightarrow$ average profits (distributed as dividends to shareholders):

  From domestic sales : $\tilde{d}_{D,t} = d_{D,t}\left(\tilde{z}_D\right) = \frac{1}{\theta}\left(\frac{\theta}{\theta-1}\frac{w_t}{Z_t \tilde{z}_D}\right)^{1-\theta} C_t;$

  From exporting : $\tilde{d}_{X,t} = d_{X,t}\left(\tilde{z}_{X,t}\right) = \frac{Q_t}{\theta}\left(Q_t^{-1}\tau_t \frac{\theta}{\theta-1}\frac{w_t}{Z_t \tilde{z}_{X,t}}\right)^{1-\theta} C_t^* - \frac{w_t}{Z_t} f_{X,t};$

  Average total profits : $\tilde{d}_t = \tilde{d}_{D,t} + \left[1 - G\left(z_{X,t}\right)\right]\tilde{d}_{X,t}.$

- $\Rightarrow$ average firm value:

$$\tilde{v}_t = E_t \sum_{s=t+1}^{\infty} \left[\beta\left(1-\delta\right)\right]^{s-t} \left(\frac{C_s}{C_t}\right)^{-\gamma} \tilde{d}_s.$$

José, Stefania, and Some Recent Literature, Continued

- Free entry into domestic economy:

$$\tilde{v}_t = \frac{w_t}{Z_t} f_{E,t}.$$

- Law of motion:

$$N_{D,t} = (1-\delta)\left(N_{D,t-1} + N_{E,t-1}\right).$$

- Number of exporters:

$$N_{X,t} = \left[1 - G(z_{X,t})\right] N_{D,t}.$$

José, Stefania, and Some Recent Literature, Continued

- Now, average productivity of firms who *do not* export:

$$\tilde{z}_{NX,t} \equiv \left[\frac{1}{G(z_{X,t}) - G(z_{\min})} \int_{z_{\min}}^{z_{X,t}} z^{\theta-1} dG(z) \right]^{\frac{1}{\theta-1}}.$$

- Then, average value *of non-exporters*:

$$\tilde{v}_{NX,t} = E_t \sum_{s=t+1}^{\infty} \left[\beta(1-\delta)\right]^{s-t} \left(\frac{C_s}{C_t}\right)^{-\gamma} \tilde{d}_{NX,s},$$

where $\tilde{d}_{NX,t} = d_{D,t}(\tilde{z}_{NX,t}) = \frac{1}{\theta} \left(\frac{\theta}{\theta - 1} \frac{w_t}{Z_t \tilde{z}_{NX,t}} \right)^{1-\theta} C_t.$

- Average value *of exporters*:

$$\tilde{v}_{X,t} = E_t \sum_{s=t+1}^{\infty} \left[\beta(1-\delta)\right]^{s-t} \left(\frac{C_s}{C_t}\right)^{-\gamma} \tilde{d}_s^X,$$

where $\tilde{d}_t^X = d_{D,t}(\tilde{z}_{X,t}) + [1 - G(z_{X,t})] \tilde{d}_{X,t}.$

- Model implication: $\tilde{v}_{X,t} > \tilde{v}_t > \tilde{v}_{NX,t}.$

- Guess: Earnings-to-price ratio and return for exporters $>$ earnings-to-price ratio and return for non-exporters.

José, Stefania, and Some Recent Literature, Continued

- Problem: No FDI in Ghironi-Melitz.
- Ramondo and Rappoport (07): FDI is only way to serve foreign market.
- What if we want choice of export vs. FDI (to serve foreign market)?
- It would be easy to embed it in Ghironi-Melitz.
- Assuming $f_I > f_X$, model would imply: $\tilde{v}_{I,t} > \tilde{v}_{X,t} > \tilde{v}_t > \tilde{v}_{NX,t}$.
- FDI and export in Ghironi-Melitz? See also Zlate (08).
- But: FDI is vertical in Zlate: offshore production of goods to be imported by the parent country.
- FDI to serve foreign market José and Stefania's paper.
- How much FDI is vertical vs. to serve foreign market in the Compustat sample?

José, Stefania, and Some Recent Literature, Continued

- In the light of observations above, some results in José and Stefania's paper are not surprising.

- However, there is a clear limitation in Ghironi-Melitz, Zlate, and others: fixed costs of exporting (and/or FDI), not sunk costs $\Rightarrow$ no hysteresis.
  - Sunk cost of exporting in Ghironi-Melitz? Sim (06), who also shows some issues in Alessandria and Choi's (*QJE*, 07) analysis of the role of sunk export costs in DSGE.

- Without sunk export entry and FDI costs, these models cannot replicate persistence features of the data and option value considerations that are prominent in José and Stefania's paper.
  - Caveat: This is completely true to the extent that the cutoff productivity for export or FDI "bounces around quite a lot" in response to shocks (recall the law of motion for $N_{D,t}$ and determination of $N_{X,t}$ above).
  - For instance, the response of the number of offshoring firms to shocks in Zlate (08) is not too different from that of $N_{D,t}$.

José, Stefania, and Some Recent Literature, Continued

- In any case, I *really* like the fact that José and Stefania can replicate/explain the features of the data they focus on in a parsimonious, intuitive model.

- But I do have some comments on the model that may generate ideas for future work.

Comment 1

- OECD (1999) definition of FDI: “FDI reflects the objective of obtaining a lasting interest by a resident entity in one economy (‘direct investor’) in an entity resident in an economy other than that of the investor (‘direct investment enterprise’). The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise. . . ”

- In the context of this definition, there are two main types of FDI:

1. Greenfield FDI: building new production capacities in the host nation or expansion of existing production facilities of the host country.

2. Acquisition of a controlling stake in an existing company: Control is usually defined as ownership of greater than or equal to 10% of ordinary shares or access to voting rights.

- José and Stefania assume that sunk cost of FDI is larger than sunk cost of export market penetration (Helpman, Melitz, and Yeaple, *AER*, 04).

- This is the same assumption I would make.

- But...

Comment 1, Continued

- I find the assumption $f_I > f_X$ realistic for greenfield FDI.
- Is it realistic for acquisition of a 10% share of an existing company?
- Not sure.
- Do we know how much of the FDI by firms in the Compustat sample is greenfield?

Comment 2

- José and Stefania assume production of a homogenous traded good in both countries, which pins down wages such that $w = w^* = 1$.

- Isn't the existence of differences in labor costs traditionally taken to be a major driver of (greenfield) FDI decisions?

- See Zlate (08) on this.

Comment 3

- In the benchmark scenario: domestic aggregate demand of differentiated varieties is deterministically given, foreign demand follows an exogenous Brownian motion.
- There are both partial equilibrium and small open economy aspects here.
- Partial equilibrium: Exogeneity of aggregate demand.
- Small open economy: Exogeneity of foreign demand.
  - Events in the home economy (such as the choice of export vs. FDI by its firms) have no impact on foreign aggregate dynamics.

Comment 3, Continued

- Realistic?
- Not quite if the home economy is the U.S.
- Evidence: FDI decisions by U.S. firms matter a great deal for host countries (Bergin, Feenstra, Hanson, *AER*, 09; Zlate, 08).
- Symmetric case? Both aggregates follow exogenous Brownian motions (?).
- Do they affect each other? Still partial equilibrium?

Comment 4

- No domestic entry (no domestic free entry condition).
- Does it matter?
- Marc Melitz and I came to the conclusion that domestic entry is central to our results.
- Would it be important if we tried to look at the implications of our model for financial variables?
- For instance, it would be the source of endogenous persistence (if we did not assume sunk export entry and FDI costs).
- Plus... do we really like monopolistic competition without free entry?
  - Bilbiie, Ghironi, and Melitz (07): (Domestic) entry is an empirically plausible mechanism for cycle propagation.
  - Feenstra (*EL*, 03): A constant number of firms "violates the spirit of monopolistic competition."
- Something else to think about...

Conclusion

- Intersection of international trade and international macro/finance is an exciting, growing field of research.
  - We will have a special International Trade and Macroeconomics session during the IFM week in the 2010 NBER SI.
- This paper makes a very interesting, valuable contribution to this line of work.
- I am biased, but I loved reading it.
- Take the comments above as suggestions for future thought.