Are Competitiveness Effects Significant?

Preliminary Paper Outline
Pre-Conference on Currency Crises Prevention

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Before the 1997-98 East Asian crisis, one of the leading explanations for why a currency crisis could spread internationally was competitiveness effects (which were often incorporated into "trade" effects). Basically, a currency devaluation in one country can improve the competitiveness of that country's exports and thereby hurt the profitability of firms and trade balance of countries which compete with those exports. During the East Asian and Russian crises, however, many people argued that competitiveness effects had little (if anything) to do with the spread of these crises. Whether competitiveness effects played a significant role in the transmission of these crises has strong policy implications for the feasibility of preventing the spread of currency crises once they occur. Therefore, this paper will assess how important competitiveness effects were in the international transmission of currency crises in the 1990's.

A tentative outline for the paper is:

I.   **Introduction**

II.   **Brief Literature Review**
- Previous theoretical work on competitiveness effects
    - Gerlach and Smets (1995)
    - Corsetti, Pesenti, Roubini, and Tille (1998)

- Previous empirical work on competitiveness effects
    - Eichengreen, Rose and Wyplosz (1996); focuses on trade effects
    - Glick and Rose (1999); focuses on trade effects
    - Forbes (2000)

III.   **Data Sets (A work in progress…)**
- The "crisis" events
    - Identify when we might expect to see a competitiveness effect
    - List of countries and dates when a country's currency fell by at least a threshold value within a given time period (exact criteria to be determined)

- Country-level data set
  - Use country-level data to identify which industries might experience a competitiveness effect during the above crisis events
  - Based on 4-digit SITC information on exports by country
  - Identify "major exports" for each crisis country during each crisis event (i.e. 4-digit industries where crisis country exports a significant share of global exports)
  - Key data source: UN Statistics Division

- Firm-level data set
  - Use firm-level data to identify which industries might experience a competitiveness effect during the above crisis events
  - Based on 4-digit SIC information on production by firms within each country
  - Identify "major industries" for each crisis country during each crisis event (i.e. 4-digit industries where crisis country produces a significant share of global production)
  - Key data source: Worldscope

- Comparison of these two data sets; Advantages and disadvantages
  - SITC information versus SIC information
  - Country-level versus firm-level analysis
  - Limitations of each data set
    - Firm-level data based on Worldscope sample information which focuses on publicly traded companies; privately-owned, government-owned and small firms may be underrepresented
    - Country-level data aggregates across important cross-firm differences which can help identify competitiveness effects
  - Limitations of both data sets
    - Neither adjusts for the import concentration of inputs used in production
    - Neither adjusts for differences in quality within 4-digit SIC or SITC groups

IV. Estimation Methodology and Key Results
- A few terms:
  - Countries indexed by n, with $n = 1...N$
  - Firms indexed by i, with $i = 1...I$
  - Export industries indexed by e, with $e = 1...E$
  - Production industries indexed by p, with $p = 1...P$

- Country-level Estimates
  - Estimate how a country's stock market return during each crisis period is affected by the industry composition of that country's exports

$$r_n = f(r_w, \mathbf{D}_n * \mathbf{e}, \mathbf{x}_n)$$

  - r_n is the return for the aggregate stock market index for country n over the crisis event
  - r_w is the world market return over the same period (to capture any aggregate shocks or "monsoonal" events); this is only used in the panel estimation discussed below
  - $\mathbf{D}_n$ is an E x E matrix of industry shares for country n; $\mathbf{D}_{e,e}$ is country n's share of global exports in industry e; all other values of $\mathbf{D}$ are zero
  - $\mathbf{e}$ is an E x 1 vector, with row e equal to the share of total global exports from the crisis country for industry e
  - $\mathbf{x}_n$ is a vector of control variables for country n, such as per capita income, region, current account balance, fiscal balance, etc.
  - Extension to panel estimation (across multiple crisis events)
  - Discuss any relevant patterns
    - Do industries of homogenous goods (such as commodities) show a stronger competitiveness effect?
    - Do industries with a higher import content of inputs show weaker competitiveness effects?

- Firm-level Estimates
  - Estimate how a firm's stock market return during each crisis period is affected by the industry in which the firm produces

$$r_i = f(r_m, \mathbf{D}_i * \mathbf{p}, \mathbf{x}_i)$$

  - r_i is the stock market return for firm i over the crisis event
  - r_m is the market return over the same period for the country where firm i is located
  - $\mathbf{D}_i$ is a P x P matrix of industry dummy variables for firm i; if p is the main industry in which firm i produces, $\mathbf{D}_{p,p} = 1$ and all other values of $\mathbf{D}$ are zero
  - $\mathbf{p}$ is a P x 1 vector, with row p equal to the share of total global production from the crisis country for industry p
  - $\mathbf{x}_i$ is a vector of control variables for firm i, such as size, leverage, profitability, etc.
  - Extension to panel estimation (across multiple crisis events)
  - Discuss any relevant patterns
    - Do industries of homogenous goods (such as commodities) show a stronger competitiveness effect?
    - Do industries with a higher import content of inputs show weaker competitiveness effects?

- Combining Country-level and Firm-level Results (Tentative)
  - Match necessary SIC and SITC information
  - Use country-level data to evaluate which 4-digit SITC industries might experience a competitiveness effect, and then estimate the impact on firm's stock market returns using SIC information
  - Use firm-level data to evaluate which 4-digit SIC industries might experience a competitiveness effect, and then estimate the impact on country's stock market returns using SITC information

- Econometric Issues to address in all the above estimates
  - Heteroscedasticity
  - Omitted variables
  - Endogeneity

V.   Lessons to Prevent the Spread of Currency Crises
- Lessons obviously dependent on the (as of yet unknown) results

- My expectation: competitiveness effects are large and significant

- If competitiveness effects are large and significant, some lessons:
  - Crises spread (at least partially) through "fundamentals"

  - Competitiveness effects are not short-run or temporary (assuming that the initial devaluation leads to the long-run equilibrium exchange rate); therefore, if a crisis causes a large currency devaluation (or depreciation) it may be difficult to prevent the spread of the crisis

  - Instead policy should focus on how to avoid the initial exchange rate misalignment

  - Also, exchange rate overshooting during a crisis could temporarily aggravate any competitiveness effects, and policy should also focus on how to avoid this overshooting

References

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