“Firm-Level Evidence on International Stock Market Comovement”
by Robin Brooks and Marco Del Negro

Discussion by Kathryn Dominguez
The Paper’s Motivation

- Degree of comovement in international equity markets has risen dramatically
  - Possible explanations:
    - decline in home bias
    - improved cross-country policy coordination
    - “globalization” of business

- Paper investigates the link between the rise in stock market comovement and the degree to which firms have become more “global”
Some Broad Questions:

- Why might stocks move together?
  - If firms did not engage in any international activity (autarky) might the portfolio decisions of investors drive asset markets to move together?
  - If asset markets were perfectly segmented might the international activities of firms lead to stock market co-movements?

- Is there a way to distinguish between alternative hypotheses?
The Paper’s Methodology

- Estimate a factor model that decomposes international stock returns into global, country-specific and industry-specific factors
- Regress the betas from the factor model on variables that measure the extent to which firms are engaged in international activities
- Test whether firms that are more exposed to global shocks are themselves more likely to be “global”
Key Results

- Global shocks are on average a more important source of return variation for companies that are more “globally diversified”.

- The importance of the global factor has increased since the mid-1980s, though in a U-shape, rather than monotonically (while balance sheet variables that characterize the extent of firm’s international activities have largely increased monotonically).

- Suggests that other (unexplored) factors may also be playing a role.
Three sorts of Comments:

- Discussion of the methodology -- what exactly are we testing?
- Discussion of the data – does it measure the right thing?
- Discussion of the results – what do we learn?
What are we testing?

- Test 1: What explains international stock returns?
- Authors use 3-factor APT model (with unobserved factors)
  - Decompose stock returns into three components (global, country and industry) using a random effects methodology
  - Fixed effects baseline –
    - Global factor is a constant
    - Country factor is zero if firm is not from country (1 otherwise)
    - Industry factor is zero if firm is not in industry (1 otherwise)
What are we testing?

- Test 2: Is there a (qualitative) relationship between firms that are most “exposed” to the global factor (from test 1) and the degree to which firms engage in international activities?

- Sort the sample of firms based on balance sheet (and other) measures and compare the average variance decomposition of the global factor for the top quartile (most international firms) with the bottom quartile (least international firms)
What are we testing?

Test 3: Is there a (quantitative) relationship between firms that are most “exposed” to the global factor (from test 1) and the degree to which firms engage in international activities?

- regress the global and country betas (estimated from the APT model) on:
  - firm-level balance sheet data
  - industry-level data (traded or non-traded classification)
  - “sales beta” -- estimated using the factor model with sales (rather than returns) data
**What are we testing?**

- **Test 4:** Which of the accounting variables is the most relevant?
  - Perform horse-race
  - Find all seem to be statistically important

- **Test 5:** Does creating portfolios of firms influence the results?
  - Regression coefficients generally increase by one order of magnitude
What are we testing?

Test 6: Has the importance of the global, country and industry factors changed (increased) over time?

- Re-estimate the APT model allowing the three factors to evolve over time (use 4 exogenous pre-specified sub-periods of data)
- note: model does not allow for time-varying exposures, but only for changes in the variance of the different factors
What are we testing?

Test 7: Are the changing factor variances capturing permanent changes related to increases in the degree to which firms engage in international activities -- or, greater capital market integration?

- Regressions of the country and global factor betas on various measures of firm-level international activities and measures of country-specific capital account openness.
- Temporary factors are not included in the regressions?
What do the data measure?

Stock Return Data

- 1,239 firms sampled from Datastream country indices
- monthly 1985 to 2002
- span 20 countries
  - U.S. firms make up 60% of market cap in sample
  - emerging markets carry very little weight
- all returns translated in U.S. dollars
- firms classified into 10 industries
What do the data measure?

- Balance Sheet Data (used as explanatory variables for second stage “beta” regressions)
  - source: Worldscope
  - key variable: “percentage of total sales generated abroad” -- called “foreign sales” in Worldscope (actually only measures sales from foreign affiliates)
  - other firm-level (balance sheet) variables: international assets and international income
    - typically these variables are not available annually -- authors use averages during sample
    - Selection bias? What are the characteristics of the firms included/excluded from the sample? Bias toward large firms?
What do the data measure?

- Other explanatory variables used in the second stage regressions:
  - classification of firms as traded or non-traded (based on broad industry classifications)
  - capital account openness measures
  - annual ratio of trade to GDP for each country

- None of the data directly measure firm-specific international activity -- why not use trade data information on more narrow industry categories (see Dominguez and Tesar, 2001)?
What do we learn?

- Key result: global shocks are a more important source of stock market variation (than country or industry shocks) for global firms

- What are these global shocks?
  - Here they are estimated in the APT model as the systematic component in returns that is not related to the firm’s country or industry
  - What can explain the U-shape in the global factor variance?
What do we learn?

Some difficult to reconcile results:

- firms in non-traded sectors have a larger exposure to the global factor than firms in the traded sector
  - Dominguez and Tesar (2001) also find that exchange rate exposure is higher for non-traded firms
- firms with low global sales betas have a larger exposure to the global factor than firms with high global sales betas
What do we learn?

Another odd result:

- in the first subperiod (mid-1980s) the country-specific shocks are more important for high international sales firms than for low international sales firms
What do we learn?

- Link between stock market comovement and the degree to which firms operate globally seems plausible -- though results are quite mixed.
- Country specific factors explain the largest proportion of stock return variation for firms -- suggesting that alternative explanations for the rise in international comovements may also be country specific.