International Transmission Through Relative Prices
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Discussion
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The ‘International Comovement Puzzle’

- Data: positive investment correlation and output correlation across countries
- IRBC(BKK) model
  - Demand-supply spillover (+)
  - Resource shifting effect (-)
Literature

1. Dampen the resource shifting effect: Imperfect international asset market

2. Strengthen the demand-supply spillover effect:
   ▶ Vertical linkages (Di Giovanni-Levchenko (2009), Burstein-Kurz-Tesar (2008))
   ▶ Low elasticity of substitution (Kose & Yi (2006), Drozd-Nosal (2008))

3. Liao & Santacreu (2012): the role of extensive margin, and endogenous TFP comovement
This Paper: Theory

- Domestic composition effect: capital-intensive versus labor-intensive sectors
- The role of relative prices of these two categories of goods
- Mechanism
  - Home labor productivity shock expands labor-intensive sector more
  - Relative price of labor-intensive goods drops
  - Foreign expands capital-intensive sector, higher demand for capital
  - Positive investment correlation as well as output comovement across countries
This Paper: Empirics

- Labor intensive production & net exports are procyclical
  - Capital-intensive sector: output and employment share are negatively correlated with real GDP
  - Labor-intensive sectors’ output is more volatile
  - Positive labor productivity shocks expand U.S. labor-intensive sector by more than the capital-intensive sector

- Relative prices of capital-intensive goods are procyclical and volatile
  - Price of capital-intensive goods positively correlated with real GDP
  - Price of labor-intensive goods negatively correlated with real GDP

- Sectoral Trade Balance
  - Real sectoral net exports are more volatile than the aggregate net exports
  - More labor intensive, more positive correlated with real GDP (Figure V)
In Summary

- This is a very neat paper
  - Provide empirical facts about sectoral dynamics and business cycles
  - A theoretic framework to introduce the composition effects through the relative prices
- Contribute to the international business cycle literature
  - Draw attention to the role of factor-intensity
  - Model generates positive international comovement
Question 1: Labor Productivity shock

- Labor productivity shock
  - What are the driving forces behind business cycle fluctuations?
  - How to estimate the labor productivity process?
  - The current method implies that labor-intensive sector receives a larger productivity shock
  - Depending on the difference between the labor shares

- If using TFP shock
  - Assign 2 times higher capital adjustment costs to the capital-intensive sector, Empirical evidence?
  - If shocks are correlated across countries, both will expand labor-intensive sector
  - Does the composition effect still work?
Question 2: Initial factor abundance

- Table III shows initial factor endowment differences does not affect the results
  - How different are they for the two countries in the analysis

- International specialization
  - The model implies a country exporting one good must import another good
  - A country which is more capital-abundant, tends to export capital-intensive goods
  - Does a positive labor productivity shock change the international trade specialization pattern?
Question 3: Net export

- Overall trade balance is countercyclical for the US
  - The model generates procyclical home net export (Figure VI)
  - It would be interesting to see IRFs of trade balance in each sector
  - Both domestically and internationally

- Trade balance in the data and in the model
  - In data, countries export and import goods in the same sector, while in model they do not
  - The observed fluctuations in trade balance in each sector may due to changes from both imports and exports
Question 4: Dividing sectors

- How to classify capital intensive sector and labor intensive sector?
  - Factor intensities are time-varying in each industry (Lin, Ju & Wang, 2010)
  - Yesterday’s labor-intensive industry may become capital-intensive today
  - One country’s labor-intensive sector may be capital-intensive in another country
  - Are capital shares the same across countries for any given sector?
  - How to estimate the capital share in each sector?

- Relative size of the two sectors
  - will affect the strength of the composition effect
Question 5: About the empirics

- **Price**: labor-intensive sector adjusts slower
  - May cause the negative correlation with real GDP

- **The sectoral trade balance**
  - Figure V shows only the two most labor-intensive sector (out of ten) are positive correlated with real GDP
  - How large are these two sectors?
Minor issues

- Vertical trade structure may affect the results
  - Suppose the labor-intensive sector uses inputs from capital-intensive sector
  - Relatively more expensive capital-intensive inputs can increase the production cost of labor-intensive goods
  - Both domestically and internationally
- Substitution between capital- and labor-intensive goods
- Factor market friction
  - Can factor be reallocated quick enough? How about skilled and unskilled workers?
- Composition effect at short and medium-run
- The other puzzles: e.g. $0 < \text{corr}(c, c^*) < \text{corr}(y, y^*)$, or trade-output comovement puzzle
Output Comovement and the Margins of Trade

Output correlation on EM and IM

Using Klenow and Hummels’ decomposition method

<table>
<thead>
<tr>
<th>Panel 1: HP-filtered output</th>
<th>Panel 2: Output growth</th>
<th>Panel 3: BP-filtered output</th>
</tr>
</thead>
<tbody>
<tr>
<td>corr($y_{i}^{hp}, y_{j}^{hp}$)</td>
<td>Coef.</td>
<td>corr($\Delta y_{i}, \Delta y_{j}$)</td>
</tr>
<tr>
<td>log($EM_{ij}$)</td>
<td>0.309***</td>
<td>log($EM_{ij}$)</td>
</tr>
<tr>
<td>(0.042)</td>
<td></td>
<td>(0.027)</td>
</tr>
<tr>
<td>log($IM_{ij}$)</td>
<td>0.031</td>
<td>log($IM_{ij}$)</td>
</tr>
<tr>
<td>(0.021)</td>
<td></td>
<td>(0.013)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.644***</td>
<td>Constant</td>
</tr>
<tr>
<td>(0.059)</td>
<td></td>
<td>(0.037)</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses. Significance at the 1% (5%) level is indicated by *** ( **).

log distance and log of entry cost as IVs.
## TFP Comovement and the Margins of Trade

TFP correlation on EM and IM

Using Klenow and Hummels’ decomposition method

<table>
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<tr>
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<th>Panel 2: TFP growth</th>
<th>Panel 3: BP-filtered TFP</th>
</tr>
</thead>
<tbody>
<tr>
<td>corr($tfp_{hp}^i, tfp_{hp}^j$)</td>
<td>Coef.</td>
<td>corr($\Delta tfp_i, \Delta tfp_j$)</td>
</tr>
<tr>
<td>log($EM_{ij}$)</td>
<td>0.275***</td>
<td>log($EM_{ij}$)</td>
</tr>
<tr>
<td>(0.037)</td>
<td></td>
<td>(0.024)</td>
</tr>
<tr>
<td>log($IM_{ij}$)</td>
<td>-0.042*</td>
<td>log($IM_{ij}$)</td>
</tr>
<tr>
<td>(0.018)</td>
<td></td>
<td>(0.012)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.215***</td>
<td>Constant</td>
</tr>
<tr>
<td>(0.051)</td>
<td></td>
<td>(0.034)</td>
</tr>
</tbody>
</table>

Note: Standard errors in parentheses. Significance at the 1% (5%) level is indicated by ***(* *). log distance and log of entry cost as IVs.
Mechanism

- Consider a positive TFP shock
- Direct effect: Demand-supply channel
- Amplification effect:
  - Innovation: Increases in $N_{dt}$
  - International Technology Diffusion: $N_{xt}$ increases and each variety has a higher average productivity (or quality) $\bar{z}_{X,t}$.
  - The effect is stronger the lower is $f_{X,t}$

- Endogenous TFP

$$TFP_t = (N_{dt} + N_{xt}^*) \left\{ \left( \frac{1}{N_{dt} + N_{xt}^*} \right) \left( N_{dt} \bar{z}_{dt} \theta^{-1} + N_{xt}^* \bar{z}_{xt}^* \theta^{-1} \right) \right\}^{\frac{1}{\theta-1}}$$