DISCUSSION OF “BILATERAL LINKAGES AND THE INTERNATIONAL TRANSMISSION OF BUSINESS CYCLES’”
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Research Questions

Empirical:
- How synchronized are business cycles across countries?
- What factors affect the degree of business cycle comovement between countries?

Theoretical: Can international business cycle models generate realistic relationships between
- The degree of cross-country comovement and
- Factors shown to affect the degree of comovement in the data?
**Empirical Approach**

“Linkage VARs” that measure

- Bilateral, *inter-temporal* transmission of output shocks
- The effect of trade and financial linkages on the strength of *inter-temporal* transmission

\[
y_{i,t} = a_{i,i,0}y_{i,t-1} + \sum_{j \neq i} a_{i,j,0} y_{j,t-1} + \sum_{j \neq i} a_{k} \sum_{j \neq i} (z(k)_{i,j,t} \times y_{j,t-1}) + \epsilon_{i,t}
\]

Where \(z(k)_{i,j,t}\) measure trade and financial linkages.
Empirical Approach

Do trade and financial linkages explain the contemporaneous cross-country correlations in the resulting VAR residuals?

- i.e. the intra-temporal linkages

\[
\text{Corr}(\hat{\epsilon}_{i,t}, \hat{\epsilon}_{j,t}) = \beta_0 + \sum_{k=1}^{K} \beta_k z(k)_{i,j,t} + u_{i,j,t}
\]
Can Existing Theory Explain This?

Shows that standard international business cycle models cannot generate a realistically strong relationship between

- Trade linkages
- The inter-temporal transmission of output shocks

Demonstrate that introducing sticky information about import prices strengthens the trade linkage-intertemporal transmission relationship
Sources of Cross-Country Transmission

Exogenous comovement due to correlated productivity shocks

Mechanism generating endogenous comovement:
- Final goods production uses home and foreign final goods as intermediates
- ↓ Foreign productivity ⇒ ↑ price of imported intermediates
- ↑ cost of production ~ ↓ productivity ⇒ ↓ output

Gives a relationship between trade-linkages and comovement, but not inter-temporally
Splitting Up Cross-Country Transmission

Sticky Information: Home can only observed lagged foreign prices

Splits cross-country transmission of output shocks over two periods:
- Intra-temporal transmission: Exogenous comovement due to correlated shocks
- Inter-temporal transmission: Endogenous comovement occurs with a lag
CONTRIBUTIONS

Combines two different empirical approaches to reveal a new feature of the data

- VAR analysis of output comovement
- How do trade and financial linkages affect output correlations?

Shows that theory struggles to explain not one puzzle (trade-comovement) but two

- Intra-temporal: Trade-Correlation Puzzle
- Inter-temporal: Trade-Transmission Puzzle

Demonstrates that sticky information can help resolve these puzzles
Bit of a Disconnect between the Empirics and the Model

What happens to intra-temporal transmission with sticky information?

- What does the model deliver?
- With sticky information, seems like the entire linkage-comovement relationship is intertemporal

Is it possible to address both puzzles?

- Calvo-type structure for sticky information
- Imported inputs in the production of capital goods as well as final goods
Bit of a Disconnect between the Empirics and the Model

Empirical motivation for sticky information?

- Sticky information approach suggests that the strength of the relationship between trade linkage and inter-temporal transmission varies with information flows
- But in the regressions linkage-inter-temporal transmission parameter \((a_k)\) is constant across country pairs

Not a contradiction (on average there are information frictions), but showing a connection would strengthen the analysis
Empirical Motivation for Sticky Information?

Proxies for information flows:

- Distance
- Phone traffic (Portes & Rey 2005)
- Mentions of foreign country in domestic newspapers (Baker, Bloom, & Davis-type approach)

Additional interaction term:

\[ y_{i,t} = a_{i,i,0}y_{i,t-1} + \sum_{j \neq i} a_{i,j,0} y_{j,t-1} + a \sum_{j \neq i} (z_{i,j,t} \times y_{j,t-1}) \]

\[ + b \sum_{j \neq i} (INFO_{i,j,t} \times z_{i,j,t} \times y_{j,t-1}) + \epsilon_{i,t} \]
Theory:
- Financial frictions and working capital constraint on the purchase of imported intermediates (Mendoza 2006)

Empirics:
- Measuring Measure trade and financial linkages with quadratic or HP trends?
- What happens if you measure financial linkages with liabilities instead of assets?
- Would it be possible to jointly estimate the model, as in a GARCH? (see Gruber & Vigufusson 2012)