

Financial Regulation, Financial Globalization, and the Synchronization of Economic Activity

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Motivation

- A key question in international economics and finance: **What is the effect of financial integration on business cycle synchronization?**
- Many argue that financial globalization, **banks' international linkages especially**, acted as catalysts for the transmission of the 2007–2008 crisis from a corner of the U.S. capital markets to the rest of the world.
- **What did we know before 2007–2008 crisis about propogation?** We lack a good understanding of the effect of financial integration on the transmission of productivity and “financial” shocks
 - Elaborate theoretical models
 - Empirical studies tend to contradict canonical models

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This Paper: Identification

- Analyze empirically the effect of financial (banking) integration on international output co-movement.
- Address some key identification issues of previous empirical research
- Identify the one-way effect of financial integration on business cycle synchronization.
 - Sample: 20 advanced economies, period 1978-2007 (pre-crisis)

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Theory

- Standard IRBC Theory (e.g. Backus, Kehoe, Kydland, 1992): A higher degree of financial integration leads to less synchronized (more divergent) output cycles
- Comparative Advantage/Specialization (Obstfeld, 1995): Cross-border financial integration leads to specialization and to divergent output cycles
- International Diversification (e.g. Heathcote and Perri, 2005): Diversification gains are larger when output growth patterns are not much correlated
- Contagion/Financial frictions (e.g. Calvo and Mendoza, 1999): Negative financial shock might lead to a withdrawal from all markets
- Synthesis (e.g. Holmstrom and Tirole, 1997; Quadrini and Perri, 2009): Opposing effects of shocks; ambiguous effect

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Empirics

- Most country studies document a positive cross-country correlation between financial integration and output co-movement (e.g. Kose et al. 2008)
- Most country-pair cross-sectional studies also document a positive cross-country correlation between bilateral financial integration and output co-movement (e.g. Imbs, 2004, 2006; Otto, Voss, and Willard, 2001).

Challenges to Identification

- Omitted Variable Bias:
 - Country-pair unobserved or hard-to-account-for factors
 - Global factors (related to other features of globalization)
- Isolating idiosyncratic from common (global/regional) shocks
- Separating productivity from financial shocks
- Reverse causality
- Measurement Issues
 - Classical measurement error may not be a major concern
 - Indirect exposure, financial centers
 - Other types of flows/holdings (FDI, FPI)

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Identification using time variation

- Confidential dataset from the BIS on banks' international bilateral exposure over the past 30 years in a panel of 20 developed countries
 - Account for time-invariant bilateral factors (e.g. culture) via country-pair fixed effects
 - Account for global shocks and trends via time fixed effects
- Focus on high-income countries during last 3 decades (before recent crisis):
 - Minimize parameter heterogeneity and outlier problems since these countries are similar
 - Can separate (roughly) the types of shocks since there was no major financial shock during this period for these countries.

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Empirical Specification: Bilateral Panel OLS

Question: Do country-pairs whose banks are more integrated over time experience a higher degree of synchronization of their business cycles?

Notation:

$$SYNCH_{ijt} = \alpha_t + \alpha_{ij} + \beta BANKINT_{ijt-1} + \mathbf{X}'_{ijt-1} \delta + \varepsilon_{ijt}$$

- α_t : Year fixed-effects (common global shocks)
- α_{ij} : Country-pair fixed-effects (bilateral unobserved or hard-to-account-for factors)
- $\mathbf{X}'_{ijt-1} \delta$: Other controls such as trade

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Three alternative measures of synchronization

- 1 SYNCH1: Negative of absolute value of real GDP per capita growth differences between countries i and j in year t (Giannone, Lenza, and Reichlin, 2009).
- 2 SYNCH2: Same as SYNCH1 but look at the deviations from the country and time average growth (Morgan, Rime, and Strahan, QJE 2004)
- 3 SYNCH3: 5-year correlation of the cyclical component of output of country-pairs

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Bilateral Bank Integration Measures

- $BANKINT1_{ijt}$: average value of the (logs) of real bilateral STOCKS - HOLDINGS of bank asset and liabilities normalized with the sum of the population of the two countries.
- $BANKINT2_{ijt}$: average value of the (logs) of real bilateral GROSS FLOWS - TRANSACTIONS of bank assets and liabilities normalized with the sum of the population of the two countries.
- According to the aggregate statistics of Lane and Milesi-Ferretti (2009):
 - Debt holdings around 67% of the total stock of international positions for our group of countries.
 - Banking activities (loans, debt) around 50% of total external positions.

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Bank Integration and Synchronization: Between Estimates

Dependent variable: Synchronization

Synchronization Measure Bank Integration Measure	SYNCH2 BANKINT1	SYNCH2 BANKINT2
Banking Integration	.078*** (.017)	.087*** (.023)
Country-Pair Fixed Effects	no	no
Time (Year) Fixed Effects.	no	no
R ²	.100	.071
Observations	5376	5376
Country-Pairs	190	190

Bank Integration and Synchronization: Within Estimates

Dependent variable: Synchronization

Synchronization Measure Bank Integration Measure	SYNCH2 BANKINT1	SYNCH2 BANKINT1	SYNCH2 BANKINT2	SYNCH2 BANKINT2
Banking Integration	.078*** (.017)	-.068*** (.029)	.087*** (.023)	-.082*** (.032)
Country-Pair Fixed Effects	no	yes	no	yes
Time (Year) Fixed Effects	no	yes	no	yes
R ²	.100	.131	.071	.132
Observations	5376	5376	5376	5376
Country-Pairs	190	190	190	190

OLS: Results Summary

Robust result (control trade patterns, dynamics, GDP growth, outliers such as Luxemburg)

- 1 Across country-pairs: A positive correlation between banking integration and GDP synchronization
 - In line with previous empirical studies
- 2 Within country-pairs: A higher degree of bilateral banking integration leads to less synchronized (more divergent) GDP fluctuations.
 - Contrasts previous studies, but supportive to “standard” theory.

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Shortcomings of OLS Estimation

- Although we have dealt with omitted variables (arising from hard-to-account-for time-invariant country-pair factors and common to all countries trends), the panel OLS coefficients may be driven by reverse causation.
- Moreover there is a possibility that we have omitted another country-pair time-varying factor (although we do control for trade and production differences)
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 - Non bank flows (FDI, FPI, other investment flows)
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Solution

A heroic approach to account for these issues

Bilateral time-varying IV: Index of legislative-regulatory harmonization policies in financial markets used as an instrument for bilateral banking linkages (using data from Kalemli-Ozcan, Papaioannou, and Peydro JIE 2010)

Legislative-Regulatory Harmonization Policies in Financial Services \Rightarrow Banking Integration \Rightarrow Business Cycle Synchronization

Panel IV

Question: Do country-pairs who harmonized their financial markets sooner, experience a higher level of banking integration, which is followed by a higher degree of synchronization of their business cycles?

Notation:

$$\begin{aligned} \text{SYNCH}_{i,j,t} &= \alpha_t + \alpha_{ij} + \beta \text{BANKINT}_{ijt-1} + \mathbf{X}'_{i,j,t-1} \Psi + \varepsilon_{i,j,t} \\ \text{BANKINT}_{i,j,t} &= \delta_t + \delta_{ij} + \gamma \text{HARMON}_{i,j,t} + \mathbf{X}'_{i,j,t} \Phi + v_{i,j,t} \end{aligned}$$

- $\text{HARMON}_{i,j,t}$: Index reflecting the degree of bilateral legislative-regulatory harmonization policies (in the context of EU's Financial Services Action Plan (FSAP))

Financial Services Action Plan

- EU Commission launched in 1999 the Financial Services Action Plan (FSAP).
- FSAP was package of legislative measures to create a single liquid financial market.
- FSAP were mainly contained in a set of EU-wide laws (27 EU Directives and 2 EU Regulations).
 - Directives do not mechanically become enforced across national borders (in contrast to Regulations).
 - EU countries delay the transposition of the Directives into national law.
 - Use information from the Commission on the implementation of each of the 27 Directives of the FSAP.

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Financial Services Action Plan (cont.)

- Categories of legislative acts
 - Banking
 - Insurance
 - Securities (Corporate law/governance)
- Examples:
 - Directive on the taking up, pursuit and prudential supervision of the business of electronic money institutions.
 - Money laundering Directive.
 - Directive on insider dealing and market manipulation.

Financial Harmonization as an Instrument

- (1) Define 27 indicator variables (one for each Directive k) that equal one if at any given year both countries in each country-pair cell have transposed the Directive into national law and zero otherwise.
- (2) Take the sum of these 27 indicator variables.

First Stage Estimates

Dependent variable: Banking Integration (*BANKINT2*)

Financial Harmonization	.3146*** (.0523)	.2597*** (.0498)
Exchange Rate Regime		-0.2221*** (0.0589)
F-score	36.24	27.22
Country-Pair Fixed-Effects	Yes	Yes
Time (Year) Fixed-Effects	Yes	Yes
Observations	5376	5376
Country-Pairs	190	190

Second Stage: Integration and Synchronization

Dependent variable: Synchronization (*SYNCH2*)

Banking Integration (<i>BANKINT2</i>)	-.4044*** (.1365)	-.5417*** (.1800)
Exchange Rate Regime		-0.1746*** (0.0726)

F-score	36.24	27.22
Observations	5376	5376
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To Conclude...

- Standard theory predicts that financial integration leads to a lower degree of business cycle synchronization
- Surprisingly, cross-country studies find the opposite
- We argued that for identification what is needed is a time-varying measure of financial integration per pair of countries

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Our Paper

- Using this type of measure for banking integration, we find:
 - In the cross-section, a higher degree of financial integration is associated with more synchronized output cycles
 - Within estimates show a higher degree of financial integration is associated with less synchronized cycles
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Policy Implications

- Our results suggest that policy suggestions based on simple time-series or cross-sectional correlations can be quite misleading.
- When productivity shocks are dominant, financial integration leads to less synchronized cycles.
- When credit shocks are dominant, this result can be reversed.
- Future research should analyze the effect of financial globalization on the propagation of the recent financial crisis (a credit shock).

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"Reduced Form" Estimates

Dependent variable: GDP Synchronization (*SYNCH2*)

Financial Harmonization	-.1246*** (.0355)	-.1380*** (.0374)
Exchange Rate Regime		-0.0538 (0.0479)
R-squared (within)	0.129	0.129
Country-Pair Fixed-Effects	Yes	Yes
Time (Year) Fixed-Effects	Yes	Yes
Observations	5376	5376
Country-Pairs	190	190