Global Banks and Systemic Risk: The Dark Side of Country Financial Connectedness

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Introduction

Many countries around the world liberalized their financial markets over the last half a century, adopting policies that promote free capital flows and removing trade barriers in financial assets. As a result, the global financial system has become increasingly more integrated and connected (Stulz (2005)). Financial integration has been a particularly important factor in the context of global banking that explains cross-border asset holdings of banking organizations (Focarelli and Pozzolo (2005)). Figure 1 illustrates this point for U.S. bank holding companies (BHCs), suggesting that U.S. BHCs held nearly twice as much foreign claims in countries that are well-connected to global financial markets relative to other less-connected countries over the period [2005:Q1-2016:Q4].

The rise of global banking over the past two decades and the concentration of foreign claims in countries that are well-connected to global financial markets has added a sense of urgency to studying the effects of connectedness on risk, and systemic risk in particular, given its large economic costs (e.g., Bernanke (1983)). This paper empirically examines whether the financial connectedness of foreign countries where U.S. global banks have exposures affects U.S. systemic risk.

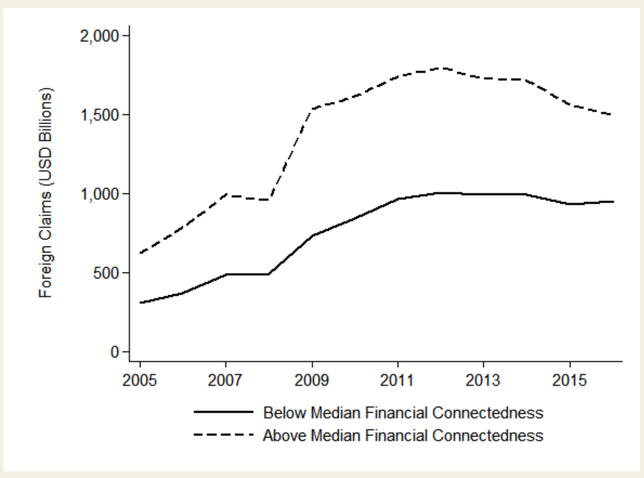

Figure 1: **U.S. BHC Foreign Claims and Country Financial Connectedness**
This figure shows U.S. BHC foreign claims (USD billions) in countries above and below median *Financial Connectedness*. The sample comprises 41 countries with *Financial Connectedness* data over the period [2005:Q1-2016:Q4]. Foreign claims data are from the Bank of International Settlements consolidated banking statistics on an immediate counterparty basis. *Financial Connectedness* measures a country's connectedness to global financial markets.

Data and Measures

BHCs' foreign claims: FFIEC 009 (country exposure reports).

- Foreign claims across countries for BHCs at the quarterly frequency (loans, bonds, etc.)
- Claims can be cross-border or local

Coverage: U.S. financial institutions with more than $30 million of claims on foreign residents. Final sample: 26,925 bank-quarter-host country observations from 45 global BHCs with foreign claims on 41 countries during 2005:Q1-2016:Q4.

- 78% of banking industry assets and 79% of U.S. financial institutions' foreign exposures in 2016:Q4

Financial integration: variance decomposition of countries' stock market index return volatilities (Diebold and Yilmaz (2014)). It captures the proportion of country i's future uncertainty due to shocks from other countries and vice-versa.

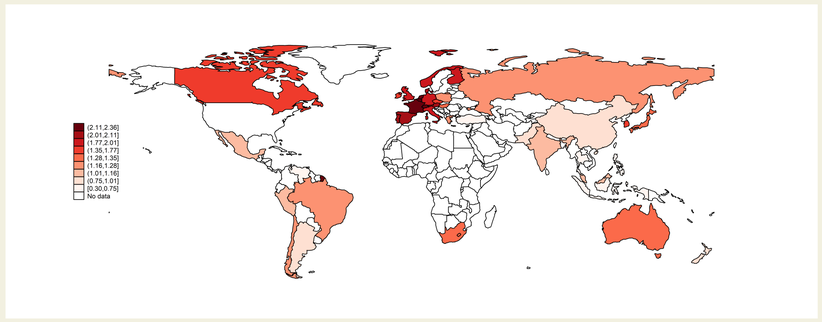

Figure 2: **Financial Connectedness across Countries**
This figure presents a heat map of average *Financial Connectedness* across the 41 countries in our sample over the period [2005:Q1-2016:Q4]. *Financial Connectedness* measures a country's connectedness to global financial markets. Darker colors indicate higher connectedness.

Systemic risk:

- Marginal expected shortfall (*MES*): *A BHC's sensitivity to a systemic event*, defined as (-1) times the average equity return during the worst five percent market return days in a given quarter (Acharya et al. (2016))
- $\Delta CoVaR$: *a BHC's contribution to systemic risk,* defined as the difference between the CoVaR of the financial system given an institution is in distress and the CoVaR conditional on the median state of the institution (Adrian and Brunnermeier (2016))

Other data: FR Y-9C (BHCs' financial statements), FRED (U.S. macroeconomic data), World Bank (country-level data)

Results

We test whether U.S. global banks with foreign claims in countries that are well connected to world financial markets have higher contribution to systemic risk with the following specification:

$$Systemic\ Risk_{i,t} = \alpha_i + \beta FinConn_{j,t-1} + \gamma W_{j,t-1} + \delta X_{i,t-1} + \zeta Z_{t-1} + \epsilon_{i,j,t}$$

where i indexes banks, j indexes countries and t indexes quarters. *Systemic Risk* is a bank's contribution to U.S. systemic risk as measured by MES or $\Delta CoVaR$. *FinConn* is the total financial connectedness between a foreign country and the rest of the world. W is a vector of host country-level controls (GDP per capita, financial market development, output synchronization). X is a vector of bank-level controls (size, leverage, bank activities, international diversification, deposit taking, credit risk, liquidity risk). Z measures U.S. economic activity. α_i denotes bank fixed effects. All explanatory variables are lagged one quarter. Standard errors are clustered at the quarter and country levels. The specifications are estimated via weighted least squares (WLS), where we weight each country exposure within a BHC-quarter proportionately to the foreign claims a BHC has in a given country during a given quarter. Then, we weight BHC-quarters equally among each other.

Table 1: U.S. BHC Systemic Risk Contribution and Country Financial Connectedness

	(1) MES	(2) ΔCoVaR
Financial Connectedness	0.023***	0:195***
	(0.000)	(0.000)
Controls	Yes	Yes
Observations	26,307	26,307
Adj. R2	.58	.75

A one standard deviation increase *Financial Connectedness* is associated, on average, with a 14.3% increase in *MES* and a 7.7% increase in $\Delta CoVaR$ relative to their mean values. The coefficients are significant at the 1% level.

Additional Analyses

- A decomposition of financial connectedness into "from" and "to" foreign countries suggests that the effect of financial integration "from" foreign countries on U.S. systemic risk seems to dominate that of financial integration "to" foreign countries.
- A decomposition of foreign claims into direct cross-border claims (claims of U.S. banks' domestic affiliates on foreign entities and individuals) and local claims (claims of the banks' affiliates in a foreign country on entities and individuals located in the foreign country) provides some (weak) evidence of larger risk effects through direct cross-border exposures.
- A sectoral decomposition of foreign claims into claims to the banking, non-bank private (e.g., corporates and households), and public sectors suggests that foreign claims to the banking and non-bank private sectors in financially connected countries account for a large portion of the increase in U.S. banks' contribution to systemic risk.
- At the bank level, we show that the systemic footprint and leverage amplify the systemic risk effects associated with global banks' claims in financially connected countries.
- At the foreign country level, we document increased spillover effects to the U.S. from countries that experience financial crises particularly when they are well financially connected.

Conclusion

Global banking continues to be at the forefront of the current policy and academic debate in the aftermath of the 2007-09 financial crisis. While global banking has strong benefits, banks' concentrated exposures in deeply integrated international markets can amplify the propagation of cross-country financial shocks.

We conclude that, in the context of global banking, cross-country financial integration is an important amplification channel for U.S. systemic risk. Our results could inform the assessment of system-level risks that arise as by-products of global banking exposures and financial market connectedness. They are particularly relevant for macro-prudential policy given the concentration of foreign financial claims in well-integrated markets, and the significant regulatory focus toward improved financial stability.

References

1. Acharya, V. V., Pedersen, L. H., Philippon, T., and Richardson, M. (2016). Measuring systemic risk. *The Review of Financial Studies*, 30(1):2-47.

2. Adrian, T. and Brunnermeier, M. (2016). CoVaR. *American Economic Review*, 106(7):1705-1741.

3. Bernanke, B. S. (1983). Nonmonetary effects of the financial crisis in propagation of the great depression. *American Economic Review*, 73(3):257-276.

4. Diebold, F. X. and Yilmaz, K. (2014). On the network topology of variance decompositions: Measuring the connectedness of financial firms. *Journal of Econometrics*, 182(1):119-134.

5. Focarelli, D. and Pozzolo, A. F. (2005). Where do banks expand abroad? An empirical analysis. *Journal of Business*, 78(6):2435-2464.

6. Stulz, R. M. (2005). The limits of financial globalization. *The Journal of Finance*, 60(4):1595-1638.