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Cross-Border Banking Flows and Organizational Complexity in Financial Conglomerates

Linda S. Goldberg¹

(Federal Reserve Bank of New York and NBER)

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I. Background

Lending by global banks has been extremely volatile in the last decade. The cross-border banking landscape has been evolving rapidly, with changing volumes and composition of flows through internationally active banks, more volatility of these flows, and a recent increase in the importance of nonbank debt. These observations provide a backdrop to our focus on the increase in organizational complexity of financial organizations and potential consequences of this structure for international capital flows.

Several charts illustrate these patterns in international capital flows through globally-active banks. Chart 1 presents the aggregate of international bank claims across internationally-active banks of countries that report to the BIS, with data shown for the mid-1990s through 2015. The red area shows credit extended internationally from these banks to nonbanks, and the blue area shows changes in credit to banks over time. The red line is a measure of volatility, the VIX index. This chart shows that international bank credit grew sharply up until the crisis period in 2008, then collapsed, and is slowly recovering in aggregate. A comparison of the volumes to

¹ Linda.Goldberg@ny.frb.org. Senior Vice President, Integrated Policy Analysis, Federal Reserve Bank of New York. Excellent research assistance was provided by Rose Wang. The views expressed in this paper are solely those of the author and should not be interpreted as reflecting the view of the Federal Reserve Bank of New York or the Federal Reserve System.

banks versus nonbanks demonstrates that, during periods of stress, the bank-to-bank flows are considerably more volatile.

<Insert Chart 1 Bank and non-bank international claims of BIS-reporting banks>

An additional window into relevant volatilities of flows is provided by decomposing banks' cross-border claims into its components, which are loans, debt securities, and other instruments. As evident from Chart 2, cross-border loans extended by banks are more volatile than the other components of claims. In terms of international assets, banks tend to have less stable funding flows to other banks, and, especially in periods of stress, the loan component is most volatile.

<Insert Chart 2 Composition of cross-border claims of BIS-reporting banks. >

The composition and behavior of international debt securities contrasts the broad issuance trends of banks and non-banks. These corporate debt securities are depicted in Chart 3, with the red area in the chart showing issuance by nonbanks, the blue area showing issuance by banks, and a measure of volatility, the VIX, presented for context. Because international debt securities issuance by banks has fallen dramatically, non-bank issuance now dominates these instruments. By comparison, the securities issuance by nonbanks appears more stable.

<Insert Chart 3 International debt securities issued by non-banks and banks>

A final important contextual point concerns the structure and volatility of types of gross capital flows into emerging markets. A general observation historically has been that bank loans have been far more volatile than flows of other financing types. Chart 4 presents a relevant breakdown for the decade between 2006 and 2015. Foreign direct investment flows (dotted dash

line) remain dominant in terms of volumes and recovered quickly post-crisis. International debt securities (thin dashed line), portfolio equity (thin solid line) and local currency debt (thick solid line) all collapsed during the crisis period and subsequently recovered. Swings in international bank loans (thick dashed line) dominate the overall volatility of credit to emerging markets. Together, these basic observations on cross-border financial flows underscore the importance of understanding the drivers of behaviors of internationally-active banks.

< Insert Chart 4 Volatility of private financing flows to EMEs >

II. New Research on International Banking Organization Structure

A recent body of research has been developing to shed light on how global banks use internal capital markets to move liquidity across their international affiliates. This type of internal movement within the organization takes place alongside the more standard description of external capital market movements through global banks as described in Section 1. Indeed, at times, international gross flows through internal capital markets have been a similar order of magnitude as international bank-to-bank flows.

Among the key questions around internal capital market flows are its drivers and differences between these flows to related parties and flows to external parties through loans or other financing methods. What has been established is that internal capital market flows respond to shocks to parent organizations, as well as to funding conditions in domestic and foreign markets. In response to a shock, parent banks seem to prioritize some foreign affiliates relative to others, setting up a hierarchy of core and periphery business investment locations.²

Another question considers the observation that, while affiliate locations can be

² For example, see Cetorelli and Goldberg (2012a, 2012b, 2012c), De Haas and Lelyveld (2010), Düwel and Frey (2012), Kerl and Koch (2015) and Wong, Tsang, and Kong (2015).

prioritized by individual global banks, differences in behaviors across global banks are observed even after conditioning on comparably sized shocks. In recent research we have been investigating a feature of global banks that has not previously been broadly explored, and which relates the structure of the organizations to which global banks belong. Each global bank is actually just a component of a much more complex organization comprised of many separate legal entities all under the umbrella of a bank holding company.

Below, we define organizational complexity in globally-active banks and discuss the findings of recent research that investigates how complexity influences bank balance sheet management. Previously, much of the discussion had focused on the role of size and business models of banks for balance sheet management. For example, studies of the bank lending channel for international transmission of shocks show that larger banks are less responsive to shocks compared with smaller banks as in Kashyap and Stein (2000). Balance sheet composition matters as well: liquidity risk effects on lending are greater for banks with fewer liquid assets, more unused credit commitments, and less stable funding sources, as in Cornett, McNutt, Strahan and Tehranian (2011). Compared with domestic banks, global banks have domestic lending activity that is less responsive to monetary policy and liquidity risk conditions, as in Cetorelli and Goldberg (2012a) and Correa, Goldberg, and Rice (2015). Our research on the implications of organizational complexity argues that a new dimension -- the complexity and structure of financial conglomerates -- should be considered as a factor in bank behaviors. In addition, in this work, we even conjecture that some of the empirical importance of size might instead be picking up the role of organizational structure.

2.1 What is organizational complexity?

Some of the thinking about what constitutes a bank and how banks behave is based on viewing the banks as simpleton organizations. While this type of perspective may be relevant for some banks, the larger banks – accounting for the majority of activity in the United States and other advanced economies – tend to be a part of much broader financial conglomerates. Accordingly, some perspectives might evolve from thinking about only the banking part of the business to considering the broader financial conglomerate to which this bank belongs and how the features of that broader financial conglomerate might influence bank behavior. The business of banking has evolved to become more complex, with many of the banks having moved from being stand-alone entities to becoming part of increasingly complex financial conglomerates (Herring and Santomero 1990; Herring and Carmassi 2010; Avraham, Selvaggi, and Vickery 2012; Cetorelli, McAndrews, and Traina 2014.).

As the concept of complexity is not generally well defined, several alternative concepts from the perspective of organizational structure can be considered, as discussed in Cetorelli and Goldberg (2014). Organizational complexity indicates the degree to which the organization is structured through separate affiliated entities. “Business” complexity refers to the type and variety of activities that may be conducted within a given institution. While organizational measures have a more direct fit with the main concerns typically associated with complexity, such as resolution, fragmentation, cross-border systemic risk, internal liquidity dynamics, managerial agency frictions, and “too big to fail,” business complexity relates more to the diversification and fragmentation of the type of production undertaken by organizations. In the context of global entities, organizational complexity can include geographic complexity, as captured by the span of the organization’s affiliates across different regions or countries. These geographical attributes are dynamic; for example, the geographical spread of U.S. bank holding

companies increased from 2000 to 2009, especially in tax havens and financial secrecy jurisdictions, while domestically located affiliates declined in the aftermath of the global financial crisis, as shown in Goldberg and Wang (2015).

We use the number of entities within a conglomerate as a measure of complexity. While this certainly is not a perfect measure that captures all dimensions of complexity, it provides an accessible and verifiable metric given the type of information that can be accessed about holding company structure. The sample of entities considered is 132 foreign financial conglomerates with branches in the United States in 2012. For each of these financial conglomerates, the organizational structure is mapped using ownership tree information from Bankscope, with the constructed measure of counts based on the parts of the tree comprised of legal entities where the head of the tree controlled at least 50 percent.

As shown in Chart 5, in which the financial conglomerates are sorted by quintile based on the number of entities in each company, the first two quintiles both contain less than 50 entities. The third quintile has about 50 to 75 legal entities, and by the fourth quintile, the number becomes much more complex with 100 to 200 legal entities. The fifth quintile is on an entirely different scale that ranges from 200 to 2500 or more entities. The size of these financial conglomerates, as measured by total assets, is correlated with complexity. However, for any given size, the conglomerates have a wide range of number of legal entities. Likewise, for a given quintile of number of legal entities, asset sizes vary dramatically.

< Insert Chart 5 Organizational Complexity of Foreign Conglomerates with US Branches >

2.2 How Organizational Complexity Influences Balance Sheet Management

Complexity may exist as a way to facilitate synergies across the different entities that are

within a conglomerate.³ The existence of organizational complexity may be associated with functional and horizontal specialization in these entities (Stein 2002, Rajan Zingales 2000, 2001a, 2001b). Thus, the individual firms behave differently in a more complex conglomerate than they would if they were part of a simpler organization, as documented for firms in the manufacturing sector (Ozbas and Scharfstein 2009).

In Cetorelli and Goldberg (2015), the specific conjecture is that, conditional on size, a commercial bank in a more complex financial conglomerate may maintain a more liquid balance sheet structure. Furthermore, the bank's activities may be more oriented towards the needs of its organization's, or alternatively, the bank's choices would be less oriented towards the local banking markets in which it is located than would otherwise be the case. The related conjecture is that the foreign bank hosted within a country may exhibit reduced sensitivities to shocks and opportunities in its host country. In this case, in response to monetary policy, regulatory instruments, or some other funding shock in the host country, the domestic bank lending channel is smaller, in line with the extent of organizational complexity, even beyond the pure effects of being global.

Cetorelli and Goldberg (2015) test the conjecture by exploring the *ex ante* balance sheet composition of a sample of foreign financial organizations with branches in the United States, and examining the cross-sectional pattern of balance sheet adjustments in response to an exogenous shock. The particular shock is a deposit insurance assessment fee reform that occurred in November 2010 when the FDIC proposed and then passed a ruling that changed the way that deposit insurance was assessed in the U.S. This fee change made wholesale funding more expensive to U.S. FDIC-insured banks and reduced demand for and lowered the cost of

³ Of course, this is not meant to argue that such synergies are the only drivers of organizational complexity. Other drivers include legal and regulatory considerations, tax incentives, tax avoidance, and residual effects of mergers and acquisitions.

wholesale funding. Since the U.S. branches of foreign banks are not subject to the FDIC assessment fee, these branches experienced a positive funding shock that lowered their cost of funding, as documented by Kreicher, L., R. McCauley, and P. McGuire (2014).

The analysis of the *ex ante* balance sheets of these branches show that their balance sheet structures differ in accordance to the complexity of the organization to which they belong. Controlling for asset size of the financial conglomerate, branches that belong to more complex organizations are larger, engage in relatively less lending within the U.S., rely more on wholesale funding, and lend more to their own conglomerate. Around the time of the funding cost shock, cross-sectional differences are evident in the responses of these branches to the shock: also controlling for size, differences are strongly correlated with organizational complexity. The branches associated with more complex conglomerates exhibit weaker overall balance sheet sensitivity to the shock in terms of assets, funding and lending, and a weaker bank lending channel.

The complexity of the conglomerate imposes statistically significant and economically relevant constraints on the related banks' own balance sheets and the external bank lending channel. Both the external bank lending channel and internal lending channel to the organization reflect the bank having some relative specialization towards its parent organization.

III. Concluding Remarks

We began by observing that international lending flows through global banks can be quite volatile. As these banks actively finance banks and nonbanks, both in their domestic markets and internationally, important questions arise about the drivers of this activity. A related set of questions arise around how financial firms use their internal capital markets domestically

and internationally. The recent research on this topic contributes a new dimension by exploring the facts and implications around the complexity of the financial conglomerate. Foreign banks hosted by the United States partially relegate their balance sheet to the potential needs of the family in relation to the complexity of the family. The bank is set up for more internal capital flows, and it maintains operations in the U.S. operations that are structurally larger and more able to generate liquidity, even after controlling for the size of the overall conglomerate. In response to a positive funding shock, banks that are part of a more complex, larger organization have less growth in their balance sheet, less funding response, and less lending response. Once we add our measure of complexity into these specifications, size becomes less important in explaining the behavior of banks.

More analysis clearly is needed on the topic of complexity in financial organizations. First, complexity is a concept that must be clearly defined in relation to whichever economic or policy question is being considered. Depending on the question, the appropriate measure might be business complexity, organizational complexity, or geographic complexity. Second, improved complexity metrics are desirable, as the entity count-based metrics that are used thus far have obvious shortcomings. Third, more research is needed so that policy and research communities better understand the costs and benefits associated with each form of complexity. An improved understanding of complexity can yield important policy-relevant insights that inform the goals of global financial stability and sustainable maximum growth.

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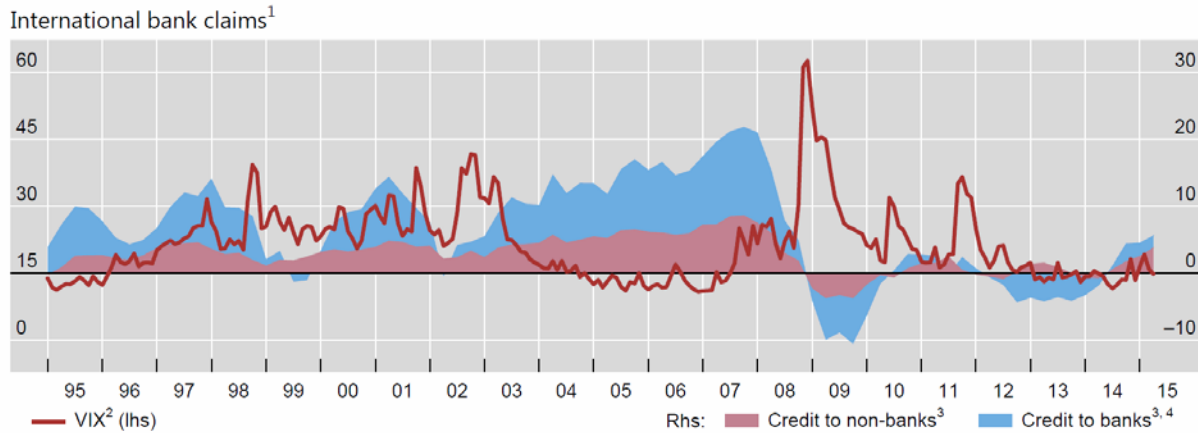
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Chart 1 Bank and non-bank international claims of BIS-reporting banks

International bank credit, international debt securities and volatility

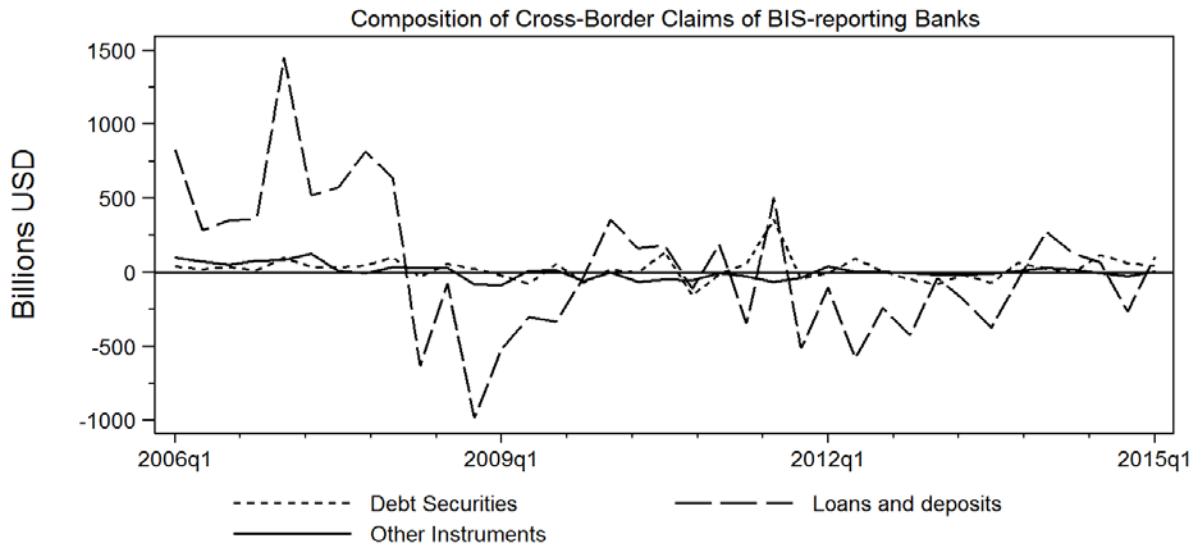
Volatility (lhs) and annual change (rhs), in per cent

Graph 1



¹LBS-reporting banks' cross-border claims plus local claims in foreign currencies. ²VIX refers to the Chicago Board Options Exchange Market Volatility Index. It measures the implied volatility of S&P 500 index options. ³Contribution to the annual percentage change in credit to all sectors. ⁴Including intragroup transactions. Sources: Bloomberg; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS locational banking statistics; BIS calculations; BIS Quarterly Review September 2015 "Highlights of Global Financing Flows."

Chart 2 Composition of cross-border claims of BIS-reporting banks.



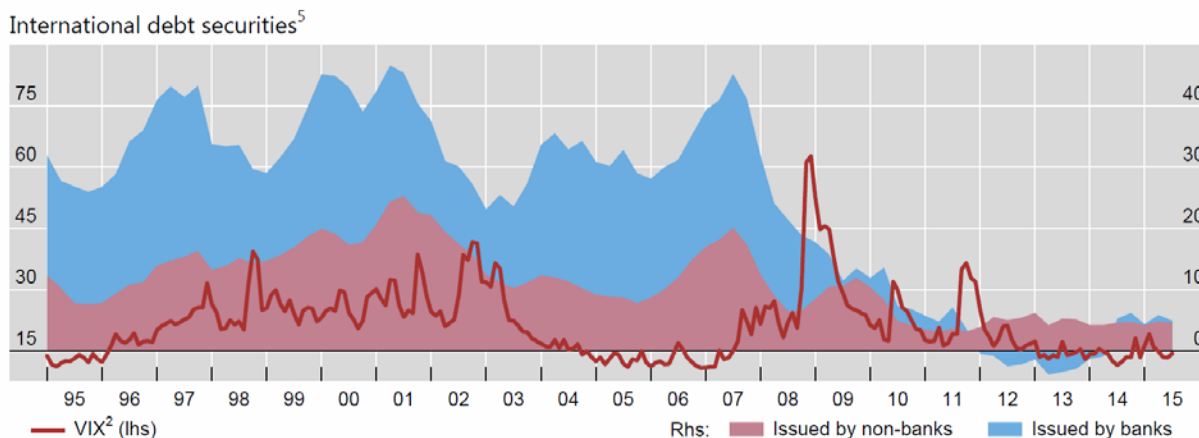
Source: BIS Quarterly Review Sept. 2015, BIS locational banking statistics by residence.

Chart 3 International debt securities issued by non-banks and banks

International bank credit, international debt securities and volatility

Volatility (lhs) and annual change (rhs), in per cent

Graph 1

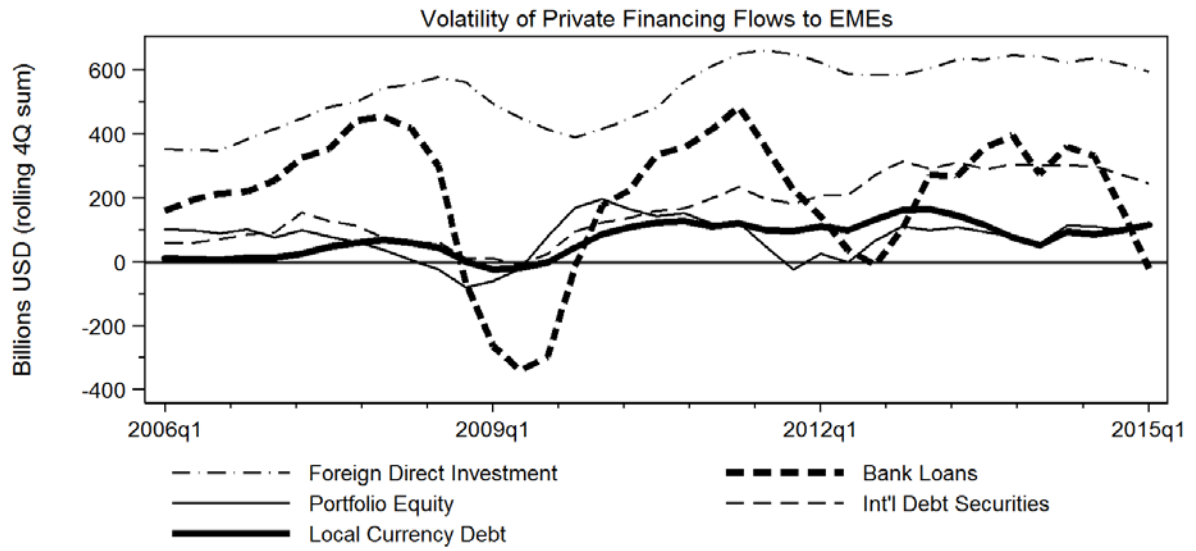


Further information on the BIS global liquidity indicators is available at www.bis.org/statistics/gli.htm.

²VIX refers to the Chicago Board Options Exchange Market Volatility Index. It measures the implied volatility of S&P 500 index options. ⁵Net issuance. All instruments, all maturities, all issuers.

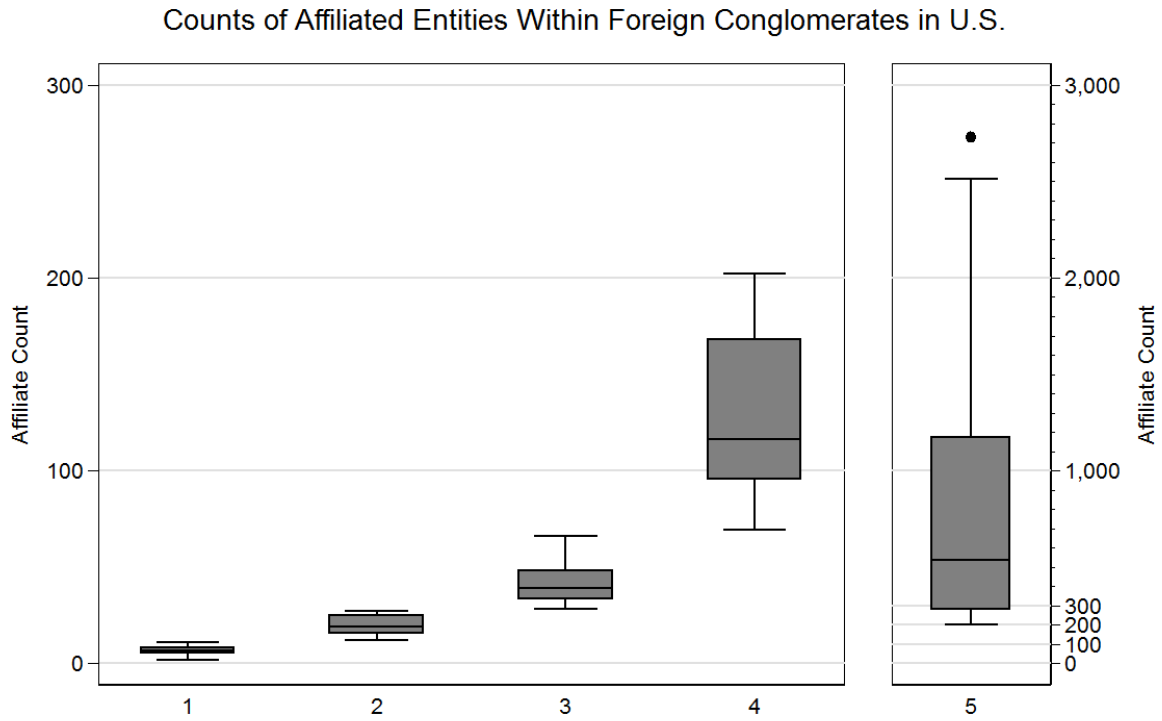
Sources: Bloomberg; Dealogic; Euroclear; Thomson Reuters; Xtrakter Ltd; BIS locational banking statistics; BIS calculations; BIS Quarterly Review September 2015 “Highlights of Global Financing Flows.”

Chart 4 Volatility of private financing flows to EMEs



Source: BIS, national authorities, Federal Reserve staff calculations.

Chart 5 Counts of affiliated entities within Foreign Financial Conglomerates in US



Note: Quintiles are indicated along the x-axis.
Source: Cetorelli and Goldberg 2015, Bankscope.