



Bank relationships, business cycles, and financial crises[☆]

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ARTICLE INFO

Article history:

Received 29 July 2011

Received in revised form 21 January 2012

Accepted 23 January 2012

Available online 30 January 2012

JEL classification:

F34

F36

Keywords:

Networks

International banking

Crises

Bank relationships

Business cycles

ABSTRACT

The importance of information asymmetries in the capital markets is commonly accepted as one of the main reasons for home bias in investment. The effects of such asymmetries may potentially be reduced through relationships between banks established through bank-to-bank lending. To analyze the dynamics of formation of such relationships during 1980–2009, I construct a global banking network of 7938 banking institutions from 141 countries. I find that recessions and banking crises tend to have negative effects on the formation of new connections and that these effects are not the same for all countries or all banks. I also find that the global financial crisis of 2008–09 had a large negative impact on the formation of new relationships in the global banking network, especially by large banks, which were previously immune to effects of banking crises and recessions.

Published by Elsevier B.V.

1. Introduction

The international finance literature has long emphasized the importance of information in international investment, citing information asymmetry as one of the leading explanations for portfolio home bias and lack of international diversification.¹ Financial

globalization created a number of avenues through which the effects of asymmetric information can potentially be reduced, such as international banking, and specifically, lending by banks to other banks.² It is commonly accepted that bank lending to corporate borrowers establishes a relationship and produces information flows between the lender and the borrower, which in turn facilitate further lending.³ It is thus reasonable to believe that lending of one bank to another establishes a channel for information flows between the lender and the borrower that might facilitate future lending, and potentially international capital flows of other types as well (Hale et al., 2011).

The recent global financial crisis had a major impact on the global banking system (Milesi-Ferretti and Tille, 2011). But did the crisis simply affect the volume of bank lending or did it also affect the structure of the international banking system? If relationships between banks play a role, implications of these two developments are not identical. The aim of this paper, therefore, is to investigate the impact of the global financial crisis, as well as of country-specific recessions and banking crises of the past 30 years on the formation of new relationships between banks and the importance of banks in affected countries. To achieve this goal, I use micro-level data on international syndicated bank loans from the Loan Analytics database to construct a bank-level global banking network (GBN) and analyze the dynamics of its structure. While syndicated bank loans do not reflect the full extent of potential relationships between banks, they are likely to be a

[☆] I am grateful to Hiro Miura and Chris Candelaria for outstanding research assistance, to Joshua Aizenman for very helpful conversations, to two anonymous referees, Matthieu Bussiere, Kristin Forbes, Reuven Glick, Charles Engel, Oscar Jorda, Jean Imbs, David Scharfstein as well as the participants at a preconference at the NBER Summer Institute 2010, seminars at the Federal Reserve Bank of San Francisco and the Banque de France, IBEFA session at 2011 AEA meetings, and NBER Global Financial Crisis conference in Bretton Woods for constructive comments and suggestions. I am grateful to Anita Todd and Elliot Marks for help with preparing the draft. All errors are mine. All views presented in this paper are mine and do not necessarily represent the views of the Federal Reserve Bank of San Francisco or Federal Reserve Board of Governors.

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¹ A number of models of international portfolio flows rely on the assumption of information asymmetry between local and foreign markets (Brennan and Cao, 1997; Okawa and Van Wincoop, 2010). Portes et al. (2001) and Portes and Rey (2005) provide direct evidence of the importance of information in determining bilateral patterns of aggregate international capital flows, while Kang and Stulz (1997) and Hatchondo (2008) show that such patterns are consistent with the model that is based on asymmetric information. Local informational advantages have also been documented in various contexts in finance literature (Ahearne et al., 2004; Bae et al., 2008; Chan et al., 2008; Coval and Moskowitz, 2001; Huberman, 2001). Veldcamp and Van Nieuwerburgh (2009) present a theoretical argument for persistence of information asymmetry.

² Milesi-Ferretti and Tille (2011) emphasize prominent growth of international banking prior to 2007.

³ See survey by Boot (2000).

better proxy for information flows than, for example, interbanks loans. Syndicated loans tend to be large-scale term loans or credit lines with maturities of several years, meaning that lenders are likely to gather substantial information about borrowers prior to extending a loan.

This is the first study in which a bank-level network is analyzed on a global scale.⁴ I construct a global network of banks in which relationships are formed by banks extending loans to each other, taking into account the direction of the lending. Because I am interested in the changes of these network statistics over time, I construct two panel data sets, each at bank-year level. One, a noncumulative panel, consists of separate new networks based on loans made in each of the years between 1980 and 2009, thus providing snapshots of lending patterns for each year. The other, a cumulative panel, is constructed by adding new loans to the network that starts in 1980 and expands through 2009, allowing me to distinguish between old and new relationships. Because informational ties between banks are unlikely to disappear at the end of each calendar year, I focus my regression analysis on new relationships, using the cumulative panel. An implicit assumption in this analysis is that bank relationships, once formed, last forever. In both panels I compute for each bank in each year the number of direct lending and borrowing connections, i.e. number of borrowers and lenders, and identify whether this bank in a given year played a role as a key intermediary, that is, whether it was the only bank connecting at least one pair of other banks to each other.

To verify that relationships between banks defined by lending of one bank to another indeed have an effect on lending and borrowing, I demonstrate, in a regression with bank fixed effects, that establishing a new relationship increases the amount of new loan origination to or by this bank in the following two to three years. Moreover, in a country-level fixed effects regression, I find that when the number of key banks in a given country increases, that country experiences an increase in both lending and borrowing for at least four years that follow. These results show that a disruption of the formation of bank relationships may result in a persistent decline in the future volume of bank to bank lending. Moreover, there is evidence that countries in which banks were more connected to other banks through a syndicated loan market prior to the global financial crisis were less affected by the crisis (Caballero et al., 2009).

Next I describe the dynamics of the overall network size and connectivity. I show that since the 1980s the global banking network experienced two major periods of rapid expansion – one in the early 1990s and one between 2002 and 2006. These periods of expansion were characterized by an increasing number of banks, increasing number of connections between banks, and increasing number of countries in which banks participate in the GBN. Importantly, network expansion during these periods was achieved more through formation of new connections by existing banks than through an increase in the number of banks. Moreover, while the first expansion was associated with an increase in total lending, such an increase in the second expansion was much less prominent. In addition, the formation of new connections and the share of banks that are key intermediaries tend to decline during recessions in the United States. Finally, a collapse of bank lending during the global financial crisis brought most network measures back to the level that was observed prior to the 2002–2006 expansion.

Before turning to the regression analysis of bank-level network statistics, I present a stylized two-country model of bank relationships that arise endogenously and respond to shocks such as demand, supply, and cost of capital. The model predicts that local recessions in

small countries can increase the number of new connections established between the banks initially, but will lower them in the long run. A recession in the United States (a larger country and “the world banker”) would increase the number of new connections made because U.S. banks would seek investment abroad. A local systemic banking crisis in a small country, represented by an increase in the cost of funding in this country, would lead to an increase in the number of new relationships formed. A global banking crisis, however, if thought of as a decline in the value of future relationships, would result in fewer new connections.

Next, in the regression analysis, I study the effects of country-specific recessions, banking crises, and the global financial crisis, controlling for the effects of total lending and borrowing. Because I am interested in the effects on new connections, I conduct the regression analysis using the year-to-year changes in the cumulative network. Conditional on total borrowing and lending, local recessions lead to fewer new connections made by banks in the affected countries, especially by banks that are smaller or that are located in developing countries, while the local banking crises have a negative effect on the formation of new borrowing connections.⁵ During recessions in the U.S., large banks are more likely to find new borrowers than during other times. In addition, the number of new key banks tends to fall in developing countries that experience recessions.

I find a large negative effect of the global financial crisis on the formation of new connections, which was felt most strongly through a decline in entry of new banks from developing countries into the GBN and a decline in the number of new connections made, especially by large banks.⁶ The rate of formation of new key banks declined and moved from developing to industrial countries during the crisis. These effects of the global financial crisis are found even when controlling for total lending and borrowing as well as for the effects of local recessions that occurred in most countries in the sample during crisis years.

The following conclusions can be drawn from the analysis: Recessions and banking crises have an important effect on the development of the global banking network through lowering the number of new connections banks make and altering the distribution of these connections across banks and countries. Thus, in addition to real costs of banking crises (Reinhart and Rogoff, 2009; Schularick and Taylor, 2010), there are costs associated with the deterioration of bank relationships. The effects of the global financial crisis on the global banking network were especially large and affected large banks that are normally immune to recessions and banking shocks. Importantly, fewer banks during the crisis played key intermediation roles, especially in developing countries. Combined with the finding that new relationships and the number of key banks tend to have a persistent effect on borrowing and lending, our results provide an additional mechanism that may partly explain the collapse in international banking flows during the crisis and the fact that it was especially pronounced in emerging markets (Milesi-Ferretti and Tille, 2011).⁷

This paper also has a methodological implication for the active literature on the stability of the global banking network. Many recent papers on financial networks analyze the potential for the spread of contagion in various exogenous network structures using simulation methods (Battiston et al., 2009; May and Arinaminpathy, 2010; Mirchev et al., 2010; Nier et al., 2007; Sachs, 2010). Others empirically analyze the structure or the development of country-specific and global banking networks (Cocco et al., 2009; Craig and von Peter,

⁵ This finding is consistent with that in Peek and Rosengren (2000) for the case of Japan.

⁶ As Rose and Wieladek (2011) demonstrate, some of this decline may be due to an increase in financial protectionism associated with massive injections of public funds into banks during the crisis.

⁷ For comprehensive analysis of factors affecting global capital flows during the crisis and the recovery, see Fratzscher (2011).

⁴ In the existing literature, either global network is analyzed at a country level (Garratt et al., 2010; Kubelec and Sá, 2010; Minoiu and Reyes, 2011; von Peter, 2007) or bank-level network is constructed for a specific country (Cocco et al., 2009; Craig and von Peter, 2010).

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