Review of Finance, 2021, 519–559
doi: 10.1093/rof/rfaa019
Advance Access Publication Date: 28 July 2020

OXFORD

What Drives Global Lending Syndication? Effects of Cross-Country Capital Regulation Gaps*

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Abstract

We examine how cross-country differences in capital regulations shape the structure of global lending syndicates. Using globally syndicated loans extended by banks from forty-four countries, we find that strictly regulated banks participate more in syndicates originated by lead lenders facing less stringent capital regulations. The resulting lending syndicates extend loans to riskier borrowers, charge higher spreads, forego covenants more frequently, and incur higher default rates. Such syndication activity also facilitates the access to credit by riskier corporations and exposes both participants and lead arrangers to greater systemic risk. Overall, our finding is consistent with the explanation that strictly regulated banks rely on the expertise of loosely regulated banks to procure risky deals outside the border.

JEL classification: G21, G30

Keywords: Global syndication network, Syndicated loans, Capital regulation, Systemic risk

Received November 5, 2019; accepted June 30, 2020 by Editor Amiyatosh Purnanandam.

* Both Janet Gao and Yeejin Jang are fellows of the Risk Institute at the Ohio State University Fisher College of Business. We are thankful to Murillo Campello, Daniel Carvalho, Sergey Chernenko, Jaewon Choi, Ricardo Correa, Andrew Ellul, Mara Faccio, Mariassunta Giannetti, Yadav Gopalan, Leslie Hodder, Joel Houston, Naveen Khanna, Jongsub Lee, Seung Jung Lee (discussant), Elena Loutskina, Ken Merkley, Camelia Minoiu (discussant), Anthony Saunders, Joseph Pacelli, Alexander Popov (discussant), Greg Udell, Michael Weisbach, and Deniz Yavuz for their valuable comments. We also thank participants in seminars at Fordham University, Hong Kong University of Science and Technology, Indiana University, Michigan State University, Purdue University, Temple University, University of Melbourne, the University of New South Wales, 2017 Arne Ryde Conference on Financial Intermediation, the 2018 Conference on "New Frontiers in Banking Research: From Corporate Governance to Risk Management," the 2018 FDIC Conference, the 2018 FMA conference, and Global Issues in Accounting Conference for helpful discussions.

1. Introduction

The syndicated lending market has become highly globalized. Banks participate extensively in syndicates organized by banks from other countries, thus becoming closely connected in a global syndication network. The total amount of globally syndicated loans has risen from $800 billion in the 1990s to over $2 trillion in recent years. US banks, for example, have doubled their allocation to foreign-led syndicates during the past two decades. Despite the importance of global syndication, little is known regarding banks' incentives to form global syndicates. In particular, what makes banks participate in deals originated by lead lenders from other countries? Does this choice generate implications for the type of loans being funded? Answering these questions is the key to understanding the drivers underlying capital flows that fund large-scale corporate activities.

We examine how capital regulation gaps across countries shape the structure of global lending syndicates. Capital regulations have been shown to have a profound influence on banks' risk appetite and lending activities. There are at least two reasons for why capital regulations may generate an effect on global syndicate structure. First, banks under lax capital regulation regimes face fewer barriers in originating loans to risky and more opaque borrowers (e.g., Thakor, 1996; Barth, Caprio, and Levine, 2004). They can thus accumulate experience in prospecting and contracting with those borrowers. Second, banks facing restrictive regulations have an incentive to participate in risky, yet profitable loans outside the border. Given that regulators generally have less information to assess the credit quality of foreign borrowers, banks can invest in high-yield loans in a foreign country while manipulating the estimated risk exposure in their financial reports.[1] Such investments can be facilitated by global syndication. As countries do not perfectly synchronize their capital regulations, strictly regulated banks can rely on the expertise of a loosely regulated lead bank to procure risky deals by participating in the lending syndicate it organizes.

Using a sample of globally syndicated loans extended by banks from forty-four countries during the period 1995–2016, we examine the structure of global lending syndicates in relation to the capital regulation disparity between lead and participant countries. We find that strictly regulated banks participate significantly more in syndicates organized by loosely regulated lead arrangers. This pattern is robust to controlling for bank–pair fixed effects and year fixed effects, suggesting that the effect is not driven by banks' innate characteristics or other time-invariant factors that affect the matching between banks. Notably, the association between capital regulation gaps and syndicate structures is concentrated in cases where the participant bank and the lead arranger have a prior syndication relationship, when the lead arranger has rich experience in lending to risky and opaque firms, and when the lead country imposes few restrictions on cross-border capital flows. Our estimates suggest that a one standard deviation increase in the capital regulation gap is associated with a 4% increase in syndication activity. This magnitude increases by 9% when the participant and lead banks have syndicated in the past. Overall, our findings are consistent with the

1 Regulators also recognize that examining foreign syndicated loans is not as straightforward as examining domestic loans. For example, the "Manual of Examination Policies" issued by the FDIC claims that "the difference in international lending is that applicable information is usually less readily available and less detailed. . . . Thus, in the financial evaluation of international loans, the credit decision must frequently be based on information inferior to that available in domestic applications." Prior studies such as Plosser and Santos (2018) also show that capital constrained banks tend to manipulate the reported risk of their syndicated loans.

argument that strictly regulated banks rely on the expertise of lead lenders in seek of risky deals.

Our findings are not without tension. There are reasons to believe that global syndication structures do not relate to capital regulation gaps between lead and participant countries, or even exhibit the opposite pattern to what we observe. First, syndicating with foreign banks can be subject to various frictions, including cultural differences, political risks, and legal barriers (Mian, 2006; Dell'Ariccia and Marquez, 2010; Giannetti and Yafeh, 2012). Banks may also decide to conduct risky investments through nonsyndicated loans or corporate bond markets. These frictions and alternative channels can diminish the benefit of global syndication. Second, lead arrangers facing restrictive capital regulations may have incentives to invite loosely regulated participants, as those participants can contribute cheap capital to the syndicate (Kashyap, Stein, and Hanson, 2010; Baker and Wurgler, 2015). This predicts the opposite syndication pattern, that is, the pairing between strictly regulated lead lenders and loosely regulated participants. The results we find thus reflect a "lower" bound of the effect of capital regulation gaps. In other words, our findings suggest that banks form global syndicates according to the regulatory gaps across countries, despite other institutional frictions and competing incentives.

We investigate the economic mechanisms underlying our findings in several steps. We start by inspecting borrower and deal characteristics of loans issued by global syndicates. We note that loosely regulated lead lenders originate more deals to small, private, and unrated firms. These deals are also funded by more syndicate participants that face stringent capital regulations. Moreover, syndicates involving more strictly regulated participants charge higher interest rate spreads to their borrowers are less likely to use loan covenants and incur higher default rates. These findings are consistent with the explanation that loosely regulated lead arrangers have a comparative advantage in originating profitable but risky deals, which appeal to banks facing strict capital regulations. Finally, we show that global syndication facilitates the access to credit by risky corporate borrowers. Those borrowers exhibit an increase in investment, employment, and sales growth in response to a tightening of capital regulations from participant countries.

How does global syndication benefit the participants? We posit that, aside from employing the expertise of a foreign lead lender, strictly regulated participants can invest in risky deals outside the border without facing increased regulatory scrutiny. As regulators cannot accurately assess the quality of foreign borrowers, banks have more flexibility in reporting the credit risk associated with those deals. To substantiate this claim, we explore country- and bank-level heterogeneity that can modulate banks' incentives to participate in foreign-led lending syndicates. We first consider regulatory scrutiny in the participant country, measured by standards for accounting transparency and the quality of regulation enforcement. A high transparency standard helps regulators better evaluate the credit quality of banks' foreign assets. A high enforcement quality suggests that banks may face frequent regulatory examination to ensure compliance. We find both characteristics to weaken the relation between global syndication activities and capital regulation gaps.

We next examine participant banks' risk-taking incentives by looking into the moderating effects of their capital adequacy and recent default experiences. Banks with low capital reserves are more likely to face binding capital requirements and have a stronger incentive to seek risky, profitable deals. Banks that have recently experienced a default in their syndicated loans portfolio are more risk averse (Murfin, 2012) and may refrain from investing in risky deals through global syndication. We find results in support of these predictions.

Lower Tier 1 capital ratios increase the tendency of strictly regulated banks to join global syndicates, while recent default experiences decrease such a tendency.

Consistent with banks investing in riskier loans through foreign-led syndication, such syndication activities are associated with increased systemic risk exposures for both the lead arranger and the participant banks. We consider a range of market-based measures of systemic risk, including long-run marginal expected shortfall (LRMES), the variance of banks' stock prices, and the correlation of a bank's stock returns with the Morgan Stanley Capital International (MSCI) world index. Across all measures of systemic risks, we find that banks are exposed to greater risks when they participate more in syndicates led by loosely regulated lead arrangers. Moreover, lead banks that source capital from more strictly regulated participant banks are also more exposed to systemic risks. This finding helps to rule out an alternative explanation, which states that lead lenders invite strictly regulated participants to help diversify and reduce risk exposure.

We conduct two additional analyses to address potential endogeneity concerns that could bias our findings. We begin by addressing the concern that our results could be driven entirely by borrowers' credit demand. To remove borrower-side determinants, we design a test that controls for borrower–year fixed effects and examine the relation between a foreign country's capital regulation stringency and its banks' likelihood to participate in the loans to the borrower. We find that capital regulation stringency in foreign countries significantly increases syndicate participation rates. We next address a reverse-causality concern that global syndication may influence regulation gaps across countries. We employ an instrumental variable (IV) estimation, selecting as instruments the historical and social features of a country that have been shown to predict banking regulation stringency (e.g., Houston, Lin, and Ma, 2012; Karolyi and Taboada, 2015). The IV-based analyses confirm our baseline results that differences in capital stringency promote global syndication.

We test the robustness of our baseline results to alternative measurement and sampling choices. First, we measure syndication activities using the dollar amount of loan shares contributed by each bank. Second, we control for the effect of banks having foreign subsidiaries. Next, we include in our baseline framework additional controls for macroeconomic, financial, and legal conditions in a country. Last, we examine the effects of other risk-inducing banking regulations such as low requirement to entry and deposit insurance. Our results persist throughout all of these analyses.

We end with a caveat that banks can gain exposure to foreign corporations through several channels, including syndicated and nonsyndicated loans, lending through foreign subsidiaries, and investment in bond markets. Syndicated lending offers several advantages over other channels. Compared to nonsyndicated lending, syndication allows banks to rely on the expertise of local lead arrangers to prospect and screen borrowers. It also helps banks avoid direct competition with dominant lenders in the host country. Direct lending through foreign subsidiaries is further limited by the capital constraints faced by those subsidiaries and the ways in which parent banks can extract profits from their subsidiaries. Finally, investing in bond markets does not allow banks to generate private information about borrowers or derive surplus from lead arrangers' market power (Schwert, 2020). Likely due to these reasons, syndicated lending remains to be the major form of cross-border lending to large corporate borrowers (Cerutti, Hale, and Minoiu, 2015). Studying the formation of global syndicates helps shed light on the incentives driving cross-border lending and the implications of such incentives for corporate access to financing.

Our study makes several contributions to the literature. We are the first to examine banks' participation choice in global lending syndicates. There has been limited research on the formation and composition of lending syndicates, especially in a global context.[2] Our study complements existing work by showing that capital regulation gaps across countries have a strong influence on the formation of global syndicates, leading strictly regulated banks to invest in syndicates organized by loosely regulated lead lenders. While such a syndicate structure facilitates the access to credit by corporations, it also brings greater systemic risk exposure to lenders. As capital regulations are designed to promote the safety and soundness of banking systems, our findings generate implications for banks' risk-taking incentives and the effectiveness of banking regulations.

Our study also relates to research on the international spillover of monetary policies (e.g., Cetorelli and Goldberg, 2012; Bruno and Shin, 2015; Correa et al., 2018; and Morais et al., 2019). Existing studies document that global banks manage their internal liquidity and asset portfolios on a global scale. A tightening of monetary policies leads banks to reduce risk-taking and reallocate credit toward safer borrowers. In contrast, our results suggest that tighter capital regulations incentivize banks to seek riskier investment through global syndication. We also offer more textured evidence on how banks can rely on the expertise of less regulated lead arrangers to generate risky deals.

Finally, our study adds to the discussion on banks' strategic behavior to circumvent domestic regulation. Prior research suggests that banks evade home country regulations by acquiring foreign assets and establishing foreign subsidiaries (e.g., Houston, Lin, and Ma, 2012; Ongena, Popov, and Udell, 2013; Karolyi and Taboada, 2015; Frame, Mihov, and Sanz, 2020). Banks also under-report asset risks to alleviate the burden of capital requirements (Vallascas and Hagendorff, 2013, Begley, Purnanandam, and Zheng, 2017; Plosser and Santos, 2018). We add to this discussion by showing that syndication facilitates foreign investments by strictly regulated banks. It also allows banks to partner with a local lead lender and access its client base.

The article proceeds as follows. Section 2 discusses existing literature and develops testable hypotheses. Section 3 introduces our data, sample, and empirical strategy. Section 4 presents the main results. Section 5 explores economic mechanisms. Section 6 describes analyses to address endogeneity concerns. Section 7 discusses additional channels of foreign investment and robustness tests. Section 8 concludes.

2. Hypothesis Development

In this section, we analyze how capital regulations can affect lead arrangers' lending expertise and participant banks' syndication choices. We also explain how cross-country disparities in capital regulations can promote global syndication.

Lead banks generally originate loans to domestic borrowers, and their lending decisions are shaped by capital regulations in the home country. One objective of capital regulations is to promote prudent lending behaviors. Consistent with this objective, existing research shows capital constraints lead banks to cut lending to risky borrowers (see, e.g., Thakor,

2 Cai (2010) and Cai et al. (2017) explore reasons for syndication such as reciprocity and past lending experience, but do not consider syndicate formation among banks from different countries. Houston, Lee, and Suntheim (2018) examine the effect of social ties between bank executives on the likelihood that they co-lead a lending syndicate.

1996; Khwaja and Mian, 2008). Stringent capital regulations are also associated with fewer nonperforming loans (Barth, Caprio, and Levine, 2004). Building on this evidence, we posit that lenient capital regulations allow banks to approach and build relationships with riskier borrowers. Over time, banks facing lax capital regulations can develop an expertise in prospecting, screening, and negotiating with such borrowers. When these banks organize a lending syndicate, they can attract participants seeking high-risk deals from other countries.

For banks under strict capital regulations, participating in global syndicates is a way to access foreign loan markets and alleviate regulatory pressure. Growing evidence suggests that banks pursue risky and profitable investments overseas in order to circumvent stringent home country regulation (e.g., Houston, Lin, and Ma, 2012; Karolyi and Taboada, 2015; Frame, Mihov, and Sanz, 2020). Ongena, Popov, and Udell (2013) also show that tighter capital regulations at home reduce banks' lending standards abroad. It is thus plausible that strictly regulated banks have incentives to participate in global syndicates that underwrite risky but profitable loans to foreign borrowers.

The argument that banks can alleviate regulatory constraints by investing in foreign loans relies on two assumptions. First, regulators in the home country face more information frictions when assessing the risk profile of foreign borrowers. Second, banks have the discretion to manipulate the reporting of credit risk exposures related to their foreign loans. There are at least two ways in which banks may manage their reporting to reduce the burden of capital regulations. First, under risk-based capital regulations, banks have some discretion to assign risk weightings to their assets.[3] Capital constrained banks can bias downward the riskiness of their assets to improve capital adequacy (Vallascas and Hagendorff, 2013; Begley, Purnanandam, and Zheng, 2017). Plosser and Santos (2018) find consistent evidence for syndicated loans. Second, banks can alter their loan loss provisions when they face capital constraints (Beatty, Ke, and Petroni, 2002). Through these channels, banks can invest in foreign loans without facing increased regulatory scrutiny.

Despite the continuing push for international coordination of banking regulations, substantial differences still exist regarding capital reserve requirements and the implementation of those requirements across countries. Such regulation gaps provide opportunities for strictly regulated banks to partner with a lead arranger under lax regulations. This type of global syndication is mutually beneficial. Participants can rely on the lead arranger's expertise to procure high-yield, high-risk deals, and the lead arranger can assemble capital from participants to complete the deals. This discussion leads to our main hypotheses:

Hypothesis 1. *Banks participate more in syndicates organized by lead banks facing less stringent capital regulations.*

Hypothesis 2. *Global syndicates involving participant banks under more stringent capital regulations extend riskier loans.*

Finally, we expect that all banks (both lead arrangers and participant banks) that seek risky loans through global syndication are more exposed to systemic risk. This is because participants contribute capital to assist the origination of risky deals.

Hypothesis 3. *Banks that are more involved in global syndication are exposed to greater systemic risk.*

3 Risk-based capital regulations specify the minimum capital reserve as a percentage of risk-weighted assets, where the weighting scheme depends on broad risk categories of the assets (Basel Accords).

We also consider two sets of alternative hypotheses that predict different global syndicate structures and lending outcomes. First, lead arrangers may have incentives to choose less regulated participants, because those participants face lower costs of capital (Kashyap, Stein, and Hanson, 2010; Baker and Wurgler, 2015). Inviting less regulated participants can thus help the lead arrangers to stay competitive in the syndicated lending market. This argument generates the opposite prediction regarding global syndication structure to Hypothesis 1, which we outline below:

Hypothesis 1a. *Banks participate more in syndicates organized by lead banks facing more stringent capital regulations.*

Second, it is also possible that lead arrangers in this market prefer participants under more stringent regulations because those participants have healthier balance sheets, which allow them to withstand negative credit shocks. The capital reserves of participants can cushion the lead arranger from potential spillover effects induced by those negative shocks as well (Nirei, Sushko, and Caballero, 2016). This argument justifies the pairing between stringently regulated participants and loosely regulated lead arrangers. Yet, it predicts that global syndicates are organized to diffuse credit risk instead of seeking risk:

Hypothesis 3a. *Banks that are more involved in global syndication are exposed to lower systemic risk.*

3. Data

3.1 Sample Construction

We obtain data on syndicated bank loans during the period from 1995 to 2016 from the LPC DealScan database. This database has been frequently used in studies on syndicated lending in the international context as well as research on the formation of lending syndicates (see, among others, Ferreira and Matos, 2012; Ivashina, Scharfstein, and Stein, 2015; Cai et al., 2017; Houston, Lee, and Suntheim, 2018). We restrict the set of lenders to those classified as banks in DealScan. We also focus on countries that are both active lenders and borrowers in the global syndication network. Specifically, we require a country to have more than five banks that have extended syndicated loans and to have borrowers receiving more than 200 loans throughout our sample period.[4]Single-lender loans and loans with missing country information for lenders are excluded. These selection criteria limit our sample to forty-four countries, which originate more than 96% of the loans in the DealScan universe. We further focus on "relevant" global syndication partners, that is, pairs of banks from different countries that appear in the same syndicated deal at least once in our sample period. This criterion eliminates bank pairs with no variation in syndication activities thus preventing an inflation of the sample.[5]

We aggregate loans and classify locations of lenders based on ultimate parent banks. This aggregation choice takes into account that banks may extend loans through their foreign subsidiaries and the possibility that the capital adequacy of parent banks can affect the

4 We additionally exclude Vietnam and Panama from the sample due to the lack of bank regulation information and the prevalence of shell companies.

5 Including all bank pairs will not change our statistical inferences.

lending behavior of subsidiaries and branches.[6] To identify the ultimate parent bank of each lender, we primarily rely on the information regarding bank ownership structure provided by DealScan and revise that information based on bank mergers.[7]

Our empirical objective is to examine the decision of banks to participate in loans originated by foreign lead arrangers.[8] We organize our testing sample in two ways. Our primary sample is a bank–pair–year panel that contains 673,108 observations of 55,149 bank pairs and spans the years from 1995 to 2016. The unit of observation is a pair of lead bank i and participant bank j ($i \neq j$) in a given year t. These data provide granular information on how individual banks respond to country-level regulations, thus allowing us to examine whether the differences in capital regulation stringency between two countries affect the likelihood that banks from one country join syndicates initiated by banks from the other country.

Our second sample is a loan-level sample, in which the unit of observation is a syndicated loan package. This sample allows us to examine the implications of syndicate structures for corporate borrowers. To obtain borrowers' financial information, we match the borrowers in DealScan to Compustat North America and Global databases.[9] Using the loan-level sample, we examine the riskiness of the loans extended by syndicates involving loosely regulated lead arrangers and strictly regulated participants. Specifically, we look into the characteristics of borrowers, pricing terms, and performance of the loans.

3.2 Global Syndication Measures

We consider two measures of syndication activity. First, we define *Syndicate* as a dummy variable indicating whether banks from two countries syndicate together in a given year, with one bank being the lead arranger and the other bank being the participant. Specifically, *Syndicate* is defined as follows:

$$Syndicate_{i,j,t} = \max_{k \in K_{i,t}} 1_{i,j,k},$$

where i indicates a lead bank, j indicates a participant bank, and k indicates a syndicated loan. $1_{i,j,k}$ is an indicator function that equals one if bank i is a lead arranger and bank j is a participant in loan k.[10] $K_{i,t}$ represents the set of all globally syndicated loans extended by bank i in year t.

6 In untabulated analyses, we verify that our results hold if lender locations are classified at the subsidiary level. We discuss in greater detail the potential influence of this aggregation choice on our results and control for the existence of foreign subsidiaries in Section 7.

7 DealScan provides information only on the most recent ownership status. For example, Wachovia was an independent bank entity prior to its merger with Wells Fargo in 2008, but it is identified in DealScan as a subsidiary of Wells Fargo for all loans it extended. We reassign loans to ultimate parent banks prior to those mergers based on banks' merger information from SDC, supplemented by institution history from the National Information Center. We thank Ha Nyugen for assisting us in this process.

8 We follow Bharath et al. (2011) and define lead lenders as banks that are classified by DealScan as "Lead Arranger," "Agent," "Administrative Agent," "Arranger," or "Lead Bank."

9 This restricts our sample to loans extended to public firms. For US borrowers, we use the link table provided by Chava and Roberts (2008) to match to Compustat, and for non-US borrowers, we manually match to Global Compustat based on borrower names and locations.

10 If bank a and bank b have participated in syndicates originated by each other, we assign two variables for this bank pair: (a, b, t) and (b, a, t), where (a, b, t) indicates whether bank b participates in bank a's deals in year t and (b, a, t) indicates whether bank a participates in bank b's deals.

Syndicate is a coarse measure of global syndication because it does not capture the intensity of syndication activities or the relative importance of a specific participant to a lead arranger. We next construct a continuous variable to capture such information. For each bank pair, we define %*Syndicate* as the percentage number of syndicated loans in which bank i is a lead arranger and bank j is a participant as a proportion of the total number of syndicated loans originated by bank i in year t. %*Syndicate* is defined as:

$$\%Syndicate_{i,j,t} = \frac{n_{i,j,t}}{\sum_{b \in B_{i,t}} n_{i,b,t}},$$

where $n_{i,j,t}$ represents the number of loans arranged by bank i in which bank j participates during year t, and $B_{i,t}$ indicates the collection of all banks (both domestic and foreign) that have participated in syndicates originated by bank i in year t. Thus, %*Syndicate* reflects the importance of bank j to bank i relative to other participants of bank i.[11]

3.3 Capital Regulation

We extract country-level capital regulatory stringency from Barth, Caprio, and Levine (2013) (*Capital Stringency*). *Capital Stringency* is a composite index measuring the level of capital reserves required and the extent to which the capital requirement of a country reflects certain risk elements and market value losses. This index reflects not only the minimum capital adequacy ratio but also the source of capital reserves and the way in which banks assign risk weighting to their assets (Barth, Caprio, and Levine, 2004; Barth, Caprio, and Levine, 2013). The regulatory indices are based on cross-country surveys conducted by the World Bank. Four surveys were conducted (in the years 1999, 2002, 2005, and 2011) in 107 countries. Following Karolyi and Taboada (2015), we apply this variable from the 1999 survey for observations from 1995 to 2001, the values from the 2002 survey for observations from 2002 to 2004, the values from the 2005 survey for observations from 2005 to 2010, and the values from the 2011 survey for observations from 2011 to 2016.

3.4 Controls

Syndication activities can be affected by the economic conditions in the country of each syndicate member. We thus control for country-level macroeconomic conditions that might affect the demand for and supply of bank credit. First, we control for the difference in investment opportunities available in the participant's country and the lead arranger's country using the difference in gross domestic product (GDP) per capita (Δ*GDP per Capita*) and the difference in real GDP growth (Δ*GDP Growth*). We further control for differences in currency appreciation (Δ*Exchange Rate Return*) and monetary policy rates (Δ*Interest Rate*) between two countries in a given year. In addition, we control for the information asymmetry and cultural differences between lead and participant countries using the log of geographical distance (*Distance*), an indicator variable denoting whether the two countries share the same language (*Common Language*), and the intensity of trade activities between two countries (*Bilateral Trade*). *Distance* is defined as the circle distance between

11 In Section 7, we construct an alternative measure that considers the dollar amount of capital contributed by each participant bank. We do not use that measure as our main dependent variable because only 27% of loans have available information on lender shares in DealScan.

the capital cities of two countries. We obtain these country-level macroeconomic variables from the World Bank and IMF databases.[12]

In loan-level analyses, we control for borrower characteristics, including borrower size, profitability, tangibility, and whether a firm has credit ratings. We also control for deal characteristics, such as loan maturity, loan size, and the number of facilities in a package. Detailed variable definitions and data sources are provided in Appendix A.

3.5 Empirical Methodology

Our baseline approach examines whether and how cross-country differences in the stringency of capital regulations relate to syndication activities between two banks. To do so, we regress measures of syndication between lead bank i and participant bank j on the difference in capital regulation stringency faced by those banks. Specifically, we estimate the following model:

$$SyndicateActivity_{i,j,t} = \beta_1 \Delta Capital\ Stringency_{i,j,t} + \beta_2 Controls + \phi_i + \eta_j + \mu_t + \epsilon_{i,j,t}, \quad (1)$$

where i indicates a lead bank, j indicates a participant bank, and t indicates the year of observation. $SyndicateActivity_{i,j,t} \in \{Syndicate_{i,j,t}, \%Syndicate_{i,j,t}\}$. $\Delta Capital\ Stringency_{i,j,t}$ measures the difference in capital regulation stringency between the participant bank country and lead bank country (i.e., participant–lead). Higher values of $\Delta Capital\ Stringency_{i,j,t}$ indicate that the participant bank faces more stringent regulations than the lead arranger.

The estimation includes lead bank fixed effects (ϕ_i) and participant bank fixed effects (η_j) to control for time-invariant characteristics of banks. Our strictest specification includes bank–pair fixed effects to control for matching effects between a lead arranger and a participant bank. We also include year fixed effects, μ_t, to control for the correlation between syndication activities and capital regulation driven by common time series trends. *Controls* include cross-country differences in macroeconomic conditions (i.e., $\Delta GDP\ per\ Capita$, $\Delta GDP\ Growth$, $\Delta Exchange\ Rate\ Return$, and $\Delta Interest\ Rate$), together with the geographical distance between two countries, whether they share a common language and the amount of bilateral trade. Since our independent variable captures regulatory gap between countries, standard errors are clustered at the country–pair level.

Hypothesis 1 predicts that strictly regulated banks participate in global lending syndicates led by less regulated banks, which suggests that $\beta_1 > 0$. Hypothesis 1a suggests that $\beta_1 < 0$.

4. Capital Regulation Gaps and Global Syndication

4.1 Univariate Analyses

We start our analyses by describing some important characteristics of the syndicated lending market. In doing so, we take a US-centered perspective to exemplify patterns and trends in banks' participation in global syndicates.

Figure 1 shows US banks' contribution to foreign-led syndicates over time. In the late 1990s, US banks allocated less than $100 billion capital to foreign-led syndicates, which accounts for a quarter of their total lending. By 2016, their contribution to foreign-led syndicates more than doubled, reaching nearly 60% of their total syndicated lending. This

12 We control for additional country-level characteristics in Section 7. Our results persist.

Figure 1. Participation in global syndicates by US banks over time.
This figure presents the time series trend of US banks' participation in syndicated loans originated by banks from other countries (i.e., foreign-led syndicates). The columns indicate the total amount of capital that US banks contribute to foreign-led syndicates every year. The solid line indicates the percentage of capital contributed by US banks to foreign-led loans relative to the total capital contributed by US banks to all syndicated loans each year. The left vertical axis shows the amount of contribution (in $billions), the right vertical axis indicates percentage contribution, and the horizontal axis indicates years.

growing trend of cross-country syndication suggests that banks are increasingly connected in a global lending network, providing capital to borrowers around the world.

We next examine the heterogeneity in foreign banks' participation in US-led syndicates. Figure 2 depicts the percentage of syndicated loans participated by banks from each country, with darker colors indicating higher participation rates. There is considerable heterogeneity in syndicate participation rates across countries. For example, banks from Canada, EU countries, and Japan are among the most active participants in US-led syndicates. Chinese, Indian, and Australian banks exhibit moderate participation rates, while Russia and other eastern European countries rarely participate.

Table I reports the capital regulation stringency and syndication activities for each of the top twenty countries in terms of syndicated lending volume. Column (1) reports capital regulation stringency for each country. Among the top syndicate lenders, US banks are moderately regulated, with eight countries having equally strict or stricter capital regulations than US and 11 countries with looser regulations. Column (2) shows the total loan amount originated by banks in each country. The statistics show that US banks are the most active players in the syndicated loans market, originating over $32 trillion over the sample period. Banks in the UK, Germany, France, and Japan are also high-volume lenders in this market. Column (3) presents the percentage of total loan amount contributed by foreign banks for loans originated by banks in a given country, and Column (4) reports the percentage of foreign participant banks over the total number of participants. There is substantial variation in the syndication structure across different countries. Japanese banks, for

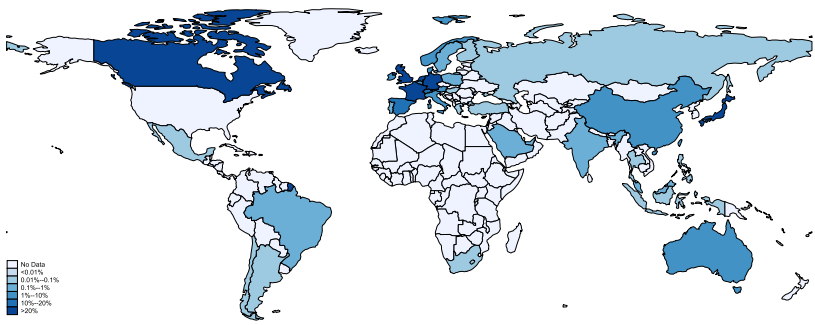

Figure 2. Participation of foreign banks in US-led syndicates.
This figure illustrates the average percentage of the number of loans arranged by US lead banks in which banks from a given country participate. The color scales suggest the degree of participation, with darker colors indicating a higher participation rate.

Table I. Summary statistics for capital stringency and global syndication activity

This table shows the summary statistics for capital stringency and loan syndication activities by country. We present the statistics for the top twenty countries in terms of syndication lending volume from 1995 to 2016. Column (1) reports the capital stringency index average over the available surveys of each country. Column (2) reports the aggregated dollar amount of loans (in billions of $US) extended by banks in a given country. Column (3) shows the percentage of the dollar amount of loans contributed by foreign participant banks. When loan share of each lender is missing, we assume all lenders contribute equally. Column (4) shows the average number of foreign participants as a proportion of the total number of participants in lending syndicates originated by banks in each country. Countries are listed in descending order of the aggregated loan amount.

Country	(1) Capital stringency	(2) Aggregate loan amount ($US bil)	(3) % Contributed by foreign banks	(4) % Foreign participants
The USA	4.8	32,240	32.8	42.0
The UK	5.3	11,963	34.9	91.5
Germany	5.3	8,942	32.2	82.8
France	4.5	8,652	32.5	83.5
Japan	3.0	6,844	30.4	19.5
Canada	2.8	6,453	35.7	66.0
Switzerland	4.8	5,259	35.7	96.1
The Netherlands	4.5	4,929	32.4	96.5
Italy	3.1	3,299	24.4	82.2
Spain	6.0	2,904	23.5	75.7
Australia	6.3	1,486	27.2	78.8
Belgium	4.6	1,309	23.2	97.4
China	4.0	1,297	20.2	39.1
Norway	5.0	852	30.5	94.4
Singapore	6.0	765	22.8	94.7
Sweden	2.0	704	27.4	94.4
Denmark	4.8	472	28.5	97.3
Austria	4.5	428	22.4	89.7
UAE	4.5	400	20.7	82.6
Ireland	4.7	388	22.4	96.4

example, maintain a relatively "isolated" syndication style in that only approximately 30% of their syndicated loans are funded by foreign banks. In a typical Japan-led syndicate, foreign banks account for less than 20% of all syndicate members. European banks, on the contrary, seem to lend in a more "open" style. For example, in an average Swiss bank-led loan, 96% of syndicate participants are foreign banks, and those banks contribute 36% of the total loan amount. US banks exhibit an intermediate degree of global syndication activity, as foreign banks account for 42% of participants for US-led loans and contribute about 33% of the capital.

Table II provides the summary statistics for the variables we use in our analyses. Panel A reports statistics for the bank–pair–year sample, and Panel B provides statistics for the loan-level sample. Each panel includes measures of global syndication activities, cross-country differences in the stringency of capital regulation, and control variables. In the bank–pair–year sample, *Syndicate* (%*Syndicate*) has a mean of 0.26 (2.52) and a standard deviation of 0.44 (10.12). The average level of Δ*Capital Stringency* is close to zero and has a standard deviation of 2.22. In the loan-level sample, Δ*Capital Stringency* has a standard deviation of 2.09. The average loan has about 63% participants located in a different country from the lead arranger.

4.2 Baseline Analyses

We estimate Equation (1) using a bank–pair–year panel to examine the relation between capital regulation differentials across countries and syndication activities. Table III reports the results. Columns (1)–(4) examine the likelihood of syndication between two banks, *Syndicate*, and Columns (5)–(8) consider the intensity of syndication activity, %*Syndicate*. For each dependent variable, we first report regression results with lead bank, participant bank, and year fixed effects and then add controls in stages. Finally, we present the results with bank–pair fixed effects.

We find that the differences in capital regulation stringency between the participant and lead countries are positively associated with syndication activities between the two banks. The estimates suggest that a one standard deviation increase in *Capital Stringency* for the participant country (2.22) is associated with a 1 percentage point increase in the likelihood that banks from two countries collaborate on a syndicated lending deal, which represents a 3% increase relative to the sample average of the likelihood of global syndication. The analyses of the extent of syndication activity yield a similar effect. The estimates in Column (8) indicate that a participant is 0.1 percentage points more likely to join a lending syndicate organized by a lead arranger that faces looser capital regulation by one standard deviation. This magnitude accounts for an approximately 4% increase relative to the sample mean of %*Syndicate*.

The results from our baseline analyses are consistent with Hypothesis 1, that is, strictly capital regulations create an incentive for banks to participate in global syndicates originated by loosely regulated banks in other countries.

4.3 Cross-Sectional Analyses

We explore cross-sectional characteristics that could influence banks' incentives to form global syndicates. We first consider the lending relationships between lead and participant banks. Cross-country syndication is fraught with information frictions, cultural, or language barriers. Prior syndication experience should help to remove such frictions. We thus

Table II. Summary statistics for capital stringency and global syndication activity

This table presents the summary statistics for our variables of interest. Panel A shows the summary statistics for the bank–pair–year sample. Panel B presents the summary statistics for the loan-level sample. Definitions of all variables are provided in Appendix A.

Panel A: Bank–pair–year sample

Variable	Mean	Median	Std. Dev.
Syndicate	0.259	0	0.438
%Syndicate	2.517	0	10.116
ΔCapital Stringency	–0.067	0	2.222
ΔGDP per Capita	–0.109	–0.050	1.279
ΔGDP Growth	0.002	0.001	0.038
ΔExchange Rate Return	0	0.001	0.087
ΔInterest Rate	0.006	0	0.156
ΔDistance	8.249	8.724	1.082
ΔCommon Language	0.132	0	0.338
ΔBilateral Trade	0.073	0.036	0.122
Past Syndicate Relationship	0.558	1	0.497
Past Syndicated Loans	0.030	0.002	0.065
Past Borrower Size	10.168	10.235	0.980
%Private Borrowers	0.599	0.543	0.214
%Unrated Borrowers	0.931	1	0.104

Panel B: Loan sample

Variable	Mean	Median	Std. Dev.
ΔCapital Stringency	–0.670	–0.667	2.092
%Foreign Participants	0.631	0.667	0.350
Loan Spread	173.297	150	122.949
Have Covenant	32.222	0	46.733
Loan Default	2.994	0	17.042
Borrower Size	8.337	8.335	1.655
Borrower Profitability	0.123	0.117	0.091
Borrower Tangibility	0.320	0.256	0.252
Borrower Rated	0.219	0.000	0.413
Loan Maturity	49.910	57.402	27.479
Loan Size	19.760	19.742	1.403
Loan Facilities	1.670	1.000	1.132

expect that, as the regulation gap between two countries widens, banks in those countries are more likely to form global syndicates if they have prior syndication experience before. Prior syndication experience is measured in two ways. First, we define *Past Syndicate Relationship*, a dummy variable that equals one if the lead and participant banks have collaborated in a syndicate deal in the previous 5 years, and zero otherwise. Second, we measure the extent of past syndication relationships using the number of past loans that two banks have extended jointly, scaled by the number of loans arranged by the lead bank, in the past 5 years (*Past Syndicated Loans*).

Table III. Effect of capital regulations on syndication activities

This table shows the relation between syndication activities across countries and the differences in the stringency of capital regulation. The regressions are conducted on a bank–pair–year panel, spanning the period from 1995 to 2016. The dependent variable in Columns (1)–(4) is *Syndicate*, the indicator for syndication between two banks. The dependent variable in Columns (5)–(8) is %*Syndicate*, the number of syndicated loans between two banks scaled by the total number of loans extended by the lead bank. All regressions except for Columns (4) and (8) control for year fixed effects, lead–bank fixed effects, and participant–bank fixed effects. Columns (4) and (8) control for year fixed effects and bank–pair fixed effects. The definitions of all variables are provided in Appendix A. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.:	*Syndicate*				*%Syndicate*			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ*Capital Stringency*	0.004**	0.004**	0.004**	0.004*	0.052***	0.050**	0.051**	0.043**
	(2.53)	(2.27)	(2.28)	(1.90)	(2.58)	(2.43)	(2.44)	(1.99)
Δ*GDP per Capita*		0.014	0.015	0.015		0.312**	0.328**	0.349**
		(0.99)	(1.20)	(1.16)		(1.96)	(2.21)	(2.24)
Δ*GDP Growth*		0.153***	0.154***	0.132**		0.349	0.389	–0.267
		(2.93)	(2.99)	(2.51)		(0.38)	(0.43)	(–0.30)
Δ*Exchange Rate Return*		0.020	0.018	0.019		0.406	0.371	0.380
		(1.20)	(1.07)	(1.14)		(1.34)	(1.22)	(1.30)
Δ*Interest Rate*		0.002	0.013	–0.006		2.054***	2.208***	1.861***
		(0.06)	(0.41)	(–0.19)		(3.46)	(3.53)	(3.25)
Distance			–0.062***				–0.728***	
			(–16.53)				(–12.60)	
Common Language			0.020*				0.122	
			(1.79)				(1.03)	
Bilateral Trade			0.010				0.071	
			(0.26)				(0.14)	
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead bank FE	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Participant bank FE	Yes	Yes	Yes	No	Yes	Yes	Yes	No
Bank–pair FE	No	No	No	Yes	No	No	No	Yes
Observations	673,108	620,979	618,131	617,451	673,108	620,979	618,131	617,451
Adjusted R^2	0.218	0.221	0.235	0.321	0.176	0.172	0.175	0.123

We next examine the role of lead banks' lending expertise. We expect that strictly regulated banks are more likely to participate in syndicates originated by banks that have more experience in prospecting risky and opaque borrowers. Lead lenders' experience is measured in three ways. First, we calculate the average size of borrowers for which a bank originated syndicated loans during the past 5 years (*Past Borrower Size*). A lower value of *Past Borrower Size* suggests that a bank has more experience lending to smaller (and potentially riskier) borrowers.[13] Second, we measure the percentage of private borrowers that a bank

13 *Past Borrower Size* is only estimated for loans extended to public borrowers.

originated loans to in the past 5 years (%*Private Borrowers*). Finally, we use the percentage of past borrowers of a bank that do not have a credit rating at the time of loan origination (%*Unrated Borrowers*). Higher values of either of these measures indicate that a lead arranger has more experience lending to opaque borrowers.

Finally, we investigate the entry barriers banks face in extending loans in the lead country. For this purpose, we examine the role of lead arrangers' market shares and the capital openness of the lead country. We consider a bank to be a "market leader" if it ranks among the top quartile of all lead banks in a country in terms of origination volume or has a market share above 5% (*Market Leader*). We conjecture that a dominant position in the market could deter new entry. Foreign banks may find it costly to compete against a market leader by extending loans independently. They face less competitive pressure when contributing capital to a market leader's deals. Capital account openness indicates the ease of transferring capital to a country (Wang and Jahan, 2017). We expect banks to participate more frequently in syndicates led by countries with high capital openness.

We regress banks' global syndication activities on the full interaction of capital regulation gaps and the above bank characteristics. Table IV reports the results. For brevity of display, we only report results for %*Syndicate*, although the results from *Syndicate* generate similar implications. Panel A displays results for past syndication experience. Columns (1) and (2) report results for the indicator for whether banks share a past syndication relationship. Columns (3) and (4) report results for the intensity of past syndication relationships. The interactive terms between Δ*Capital Stringency* and measures of prior syndication experiences yield positive and statistically significant coefficients. The estimates suggest that with a one standard deviation increase in regulation differences, banks with prior syndication experiences increase their global syndication activities by 9% more than banks without past syndication experiences ($= 2.22 \times 0.098/2.52$). Our findings suggest that, as banks seek investment opportunities outside the border, they are more likely to turn to lead lenders with whom they have previously worked before.

(continued) Panel B reports results for lead banks' lending expertise. Δ*Capital Stringency* ×*Past Borrower Size* generates a negative coefficient, while the interaction terms between capital regulation gaps and lead arrangers' experience with private and unrated borrowers attract positive coefficients. These results suggest that strictly regulated banks are more likely to collaborate with lead arrangers that have richer lending experience with risky and opaque borrowers. Panel C presents the effects of lead banks' market shares and capital account openness. Consistent with our predictions, strictly regulated banks are more likely to participate in lending syndicates organized by a market leader. They are also more likely to invest in deals in countries with high capital account openness.

The results from our cross-sectional analyses help pinpoint frictions that can affect banks' participation in global lending syndicates. The association between capital regulation gaps and global syndication is concentrated for banks that have syndicated in the past. It is also stronger for lead arrangers with more experience with risky borrowers. Finally, the market power of lead arrangers promotes collaboration among banks, but policy-stipulated barriers to capital flows inhibit global syndication activities.

Table IV. Cross-sectional analyses

This table shows the role of past syndication relations, lead banks' lending expertise, and entry barriers in modulating the relation between capital regulation gaps and global syndication activity. The dependent variable is %*Syndicate*. Panel A reports results from interactive regressions of capital regulation gaps and past syndication relation between two banks. Syndication relationships are measured by an indicator for the lead and participant banks having been in the same syndicate in the past 5 years (*Past Syndicate Relationship*) and the number of loans they issued together scaled by the number of loans arranged by the lead bank in the past 5 years (*Past Syndicated Loans*). Panel B reports the interactive effect of capital regulation gaps and lead arrangers' experience in lending to small and opaque borrowers. Columns (1) and (2) report results for lead arrangers' average borrower size in the past 5 years. Columns (3) and (4) examine the percentage amount of loans that the lead bank extended to private borrowers in the past 5 years. Columns (5) and (6) examine the percentage amount of loans that the lead bank extended to unrated borrowers in the past 5 years. Panel C reports the interactive effect of capital regulation gaps and entry barriers that banks face in lead countries. Columns (1) and (2) examine the role of a lead arranger as a top market leader in the country in terms of market shares. *Market Leader* is an indicator for the lead banks who rank among the top quartile of all lead banks in terms of origination volume over previous 3 years or whose market share is greater than 5% in a country. Columns (3) and (4) report results for the lead countries with high capital account openness, where the Wang–Jahan capital account openness is in top tercile. The definitions of all variables are provided in Appendix A. Controls include the same set of variables used in Columns (7) and (8) of Table III. Standard errors are clustered by country-pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Past syndication relationships

Dep. Var.: %*Syndicate*	(1)	(2)	(3)	(4)
Δ*Capital Stringency* × *Past Syndicate Relationship*	0.080**	0.098**		
	(2.24)	(2.50)		
Past Syndicate Relationship	3.952***	3.726***		
	(28.88)	(27.09)		
Δ*Capital Stringency* × *Past Syndicated Loans*			0.701**	0.803**
			(2.16)	(2.10)
Past Syndicated Loans			65.434***	64.455***
			(82.09)	(67.38)
Δ*Capital Stringency*	–0.046**	–0.057**	0.012	0.005
	(–2.17)	(–2.57)	(1.32)	(0.57)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Lead and participant bank FE	Yes	No	Yes	No
Bank–pair FE	No	Yes	No	Yes
Observations	527,475	525,999	519,370	517,755
Adjusted R^2	0.135	0.170	0.288	0.283

Table IV. Continued

Panel B: Lead arranger expertise

Dep. Var.: %*Syndicate*	(1)	(2)	(3)	(4)	(5)	(6)
Δ*Capital Stringency* × *Past Borrower Size*	–0.018**	–0.021***				
	(–2.22)	(–2.86)				
Past Borrower Size	–0.009	–0.010				
	(–0.41)	(–0.45)				
Δ*Capital Stringency* × %*Private Borrowers*			0.155**	0.183**		
			(2.51)	(2.36)		
%*Private Borrowers*			–0.720***	–0.638***		
			(–3.19)	(–2.77)		
Δ*Capital Stringency* × %*Unrated Borrowers*					0.321**	0.262*
					(2.49)	(1.75)
%*Unrated Borrowers*					–0.720**	–0.760**
					(–2.35)	(–2.45)
Δ*Capital Stringency*	0.234***	0.276***	–0.057	–0.080	–0.261**	–0.211
	(2.95)	(3.72)	(–1.35)	(–1.52)	(–2.19)	(–1.52)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead and participant bank FE	Yes	No	Yes	No	Yes	No
Bank–pair FE	No	Yes	No	Yes	No	Yes
Observations	269,011	264,112	573,062	571,671	573,062	571,671
Adjusted R^2	0.247	0.425	0.0933	0.140	0.0932	0.140

Panel C: Entry barrier

Dep. Var.: %*Syndicate*	(1)	(2)	(3)	(4)
Δ*Capital Stringency* × *Market Leader*	0.082**	0.098***		
	(2.52)	(2.86)		
Market Leader	0.270***	0.276***		
	(2.60)	(2.68)		
Δ*Capital Stringency* × *High Capital Openness*			0.032	0.067*
			(1.17)	(1.96)
High Capital Openness			0.214**	0.189*
			(2.23)	(1.79)
Δ*Capital Stringency*	–0.033	–0.053	0.022	0.001
	(–0.90)	(–1.41)	(0.97)	(0.02)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Lead and participant bank FE	Yes	No	Yes	No
Bank–pair FE	No	Yes	No	Yes
Observations	545,518	545,978	516,272	515,239
Adjusted R^2	0.130	0.167	0.176	0.118

5. Economic Mechanisms and Implications

Why do strictly regulated banks participate in syndicates led by loosely regulated banks? We conduct several sets of analyses to investigate the economic mechanisms underlying this finding and its implications. First, we look into borrower characteristics and loan terms associated with syndicates composed of loosely regulated lead arrangers and strictly regulated participants. Second, we examine the real effect of global syndication on borrowers. We next conduct cross-sectional analyses to explore potential channels through which strictly regulated banks may benefit from global syndication. Finally, we evaluate the implications of global syndication for the systemic risk exposure of both lead and participant lenders.

5.1 Borrower Selection, Loan Pricing, and Loan Performance

Our baseline findings can be explained by strictly regulated participants seeking risky deals by partnering with less regulated lead arrangers, who have the advantage to originate such deals. We verify this motive by examining whether syndicates composed of loosely regulated lead lenders and stringently regulated participants extend riskier loans and charge higher interest rates. We also explore the real effects of banks' global syndication motives by tracking the investment, employment, and sales growth of their borrowers.

5.1.a. *Borrower characteristics and lead lenders' capital stringency*

We begin by looking into the relationship between borrowers' credit quality and the capital regulation stringency faced by lead arrangers. We consider several measures of credit quality, including borrower size, whether the borrower is a public firm, and whether it has a credit rating at the time of loan issuance. If loosely regulated banks have an advantage to prospect riskier and more opaque borrowers, we should observe them to originate more loans to small, private, and unrated borrowers.

Figure 3 depicts the relationships between lead lenders' capital stringency and borrower risk profiles measured by size, public status, and ratings. For each characteristic, we divide sample loans into decile groups based on lead arrangers' capital stringency, and plot the average borrower characteristic within each group. The dots represent the average borrower characteristics in each capital regulation decile group, and the solid line represents the estimated regression slope from regressing borrower characteristics on lead arrangers' capital stringency. The regressions control for industry fixed effects. The patterns suggest that loosely regulated lead lenders lend to smaller borrowers. They also lend to more private firms and firms without credit ratings. These patterns are consistent with our conjecture that less regulated lead arrangers develop expertise lending to riskier and more opaque borrowers.

5.1.b. *Borrower characteristics and capital stringency gaps*

We next examine whether syndicates with more regulated participants and less regulated lead arrangers lend to riskier firms. Accordingly, we define Δ*Capital Stringency* for a loan package as the difference between the average capital stringency across all participant banks and the capital stringency of the lead arranger. Our sample of globally syndicated loans can be partitioned into two groups, one with participants facing stricter regulations than the lead bank, and the other with participants facing looser regulations than the lead bank. Panel A of Table V reports differences in borrower characteristics between the two

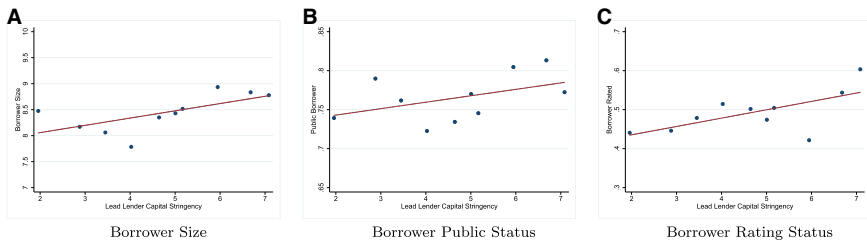

Figure 3. Capital stringency faced by lead arrangers and borrower characteristics.
This figure depicts the relation between lead arrangers' capital regulation stringency and the characteristics of the borrower they lend to. (**A**) Borrower size. (**B**) The percentage of borrowers that are public firms, and (**C**) the percentage of borrowers that have a credit rating. In each panel, the dots represent the average borrower characteristics in a given lead lender capital stringency decile. The horizontal axis indicates the capital regulation stringency faced in lead arrangers' countries, and the vertical axis indicates the characteristics of the borrower that the lead arrangers lend to. The red solid line represents the fitted regression line of borrower characteristics on capital stringency. All regressions control for industry fixed effects at the two-digit SIC level.

groups, together with the statistical significance of the differences. Syndicates that involve more stringently regulated participants extend more loans to small, private, and unrated firms, all of which indicate a riskier borrower base.

5.1.c. *Loan pricing, performance, and participants' capital stringency*

We relate loan contract terms and performance to the capital regulation gaps between participant and lead banks. We look into loan spreads, the use of covenants, and loan default. Loan spreads proxy for the profits lenders derive from a syndicated deal. The use of covenants suggests that lenders are willing to exert efforts to monitor the borrower's credit conditions throughout the course of a loan to mitigate losses from default (see, e.g., Nini, Smith, and Sufi, 2009; Falato and Liang, 2016). Loan default is an ex post indicator of lenders' credit risk exposure. If strictly regulated banks participate in foreign-led loan syndicates in search of risky and profitable deals, these banks should require higher profits on the syndicated loan deals but also have a higher tolerance for credit risk. This implies that syndicated loans with wider capital stringency gaps between participant and lead lenders should charge higher spreads, use covenants less frequently, and have higher default rates.

We define the spreads on a loan package as the weighted average of all-in-drawn spreads (*Loan Spread*) in basis points over LIBOR across all facilities in the package. Weights are assigned based on facility amount. The use of covenants is defined as an indicator variable, *Have Covenant*, that equals one if the loan package includes any restrictive covenants, and zero otherwise. Finally, *Loan Default* is a dummy variable that equals one if the borrower drops to a default rating according to Standard & Poor's ("D" or "SD") prior to loan maturity. We then multiply both covenant and default indicators by 100, so the regression coefficients indicate likelihoods in percentage points.

We estimate the following regression model:

$$Y_k = \theta_1 \Delta Capital\,Stringency_k + \theta_2 Controls_k + \kappa_m + \eta_c + \xi_i + \tau_t + \epsilon_k, \qquad (2)$$

where $Y_k \in \{Loan\ Spread, Have\ Covenant, Loan\ Default\}$. In Equation (2), k indicates a syndicated loan, m indicates the borrower's industry, c indicates the borrower's country, i

Table V. Capital regulations, borrower characteristics, and loan terms

This table examines the relationship among the capital regulation faced by syndicate participants, borrower characteristics, and loan terms. The sample contains all globally syndicated loans to publicly traded borrowers during the period from 1995 to 2016. Panel A compares the characteristics of borrowers between loans extended by syndicates where the foreign participants face stricter regulation than the lead lender and loans extended by syndicates where foreign participants face looser regulation than the lead lender. Panel B examines loan spread, loan covenant, and loan default. The sample is further restricted to the loans with nonmissing loan spread information. *Have Covenant* is an indicator variable for the loan that includes any restrictive covenants. *Loan Default* is an indicator variable that equals one if the borrower drops to a default rating from S&P during the course of the loan, zero otherwise. Default regressions only use loans extended to rated borrowers. Both indicators are multiplied by 100. All regressions include industry fixed effects based on two-digit SIC code, year fixed effects, and borrower and lead country fixed effects. The definitions of all variables are provided in Appendix A. Standard errors are clustered by borrower country. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Borrower base

	(1)	(2)	(3)
Sample:	Δ*Capital Stringency*≥ 0	Δ*Capital Stringency* < 0	Difference ((1) – (2))
Borrower Size	8.145	8.500	-0.355^{***}
Public Borrower	0.727	0.734	-0.007^{*}
Rated Borrower	0.532	0.585	-0.053^{***}

Panel B: Loan spreads, covenant, and default

Dep. Var.:	*Loan Spread*		*Have Covenant*		*Loan Default*	
	(1)	(2)	(3)	(4)	(5)	(6)
Δ*Capital Stringency*	2.551^{***}	2.352^{***}	-0.463^{**}	-0.421^{*}	0.153^{***}	0.147^{***}
	(4.95)	(4.55)	(–2.08)	(–1.87)	(2.84)	(2.62)
%*Foreign Participants*		47.605^{***}		-9.931^{***}		2.018^{**}
		(8.90)		(–3.29)		(2.04)
Borrower Size	-22.723^{***}	-23.820^{***}	-6.082^{***}	-5.853^{***}	-1.259^{***}	-1.317^{***}
	(–12.48)	(–10.31)	(–7.40)	(–8.63)	(–14.13)	(–13.16)
Borrower Profitability	-202.188^{***}	-196.794^{***}	6.160^{**}	5.035^{**}	-17.012^{***}	-16.805^{***}
	(–7.73)	(–8.10)	(2.32)	(2.05)	(–8.53)	(–8.98)
Borrower Tangibility	23.481^{***}	23.940^{***}	-3.983^{**}	-4.079^{**}	2.577^{***}	2.633^{***}
	(6.94)	(6.81)	(–2.15)	(–2.16)	(3.64)	(3.51)
Borrower Rated	15.161^{***}	14.542^{***}	1.575	1.705		
	(2.83)	(2.73)	(1.20)	(1.32)		
Loan Maturity	0.625^{***}	0.623^{***}	0.160^{***}	0.160^{***}	0.064^{***}	0.064^{***}
	(15.95)	(16.92)	(2.87)	(2.89)	(5.74)	(5.78)
Loan Size	-11.689^{***}	-12.046^{***}	3.364^{***}	3.438^{***}	–0.007	–0.022
	(–6.92)	(–6.99)	(2.62)	(2.68)	(–0.08)	(–0.24)
Loan Facilities	23.067^{***}	22.712^{***}	0.057	0.131	0.624^{***}	0.607^{***}
	(10.47)	(10.95)	(0.11)	(0.26)	(2.85)	(2.91)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Borrower country FE	Yes	Yes	Yes	Yes	Yes	Yes
Lead country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	61,945	61,945	61,945	61,945	36,318	36,318
Adjusted R^2	0.485	0.492	0.289	0.291	0.0681	0.0685

indicates the lead arranger's country, and t indicates the year of loan issuance. $\Delta Capital\ Stringency_k$ is the difference between the average capital stringency across all foreign participants' countries and the capital stringency in the lead lender's country in year t. *Controls* include borrower characteristics such as size, profitability, asset tangibility, and an indicator for the borrower having a credit rating. In default regressions, we drop *Borrower Rated* as a control because loan default is only defined for rated borrowers. The estimation also includes deal-level characteristics such as maturity (*Loan Maturity*), the log amount of loan principal (*Loan Size*), and the number of facilities in the deal (*Loan Facilities*). In addition, we control for borrower–industry fixed effects (κ_m), borrower–country fixed effects (η_c), lead lender–country fixed effects (ξ_i), and year fixed effects (τ_t). We predict that $\theta_1 > 0$ for spreads and default but $\theta_1 < 0$ for the use of covenants.

Panel B of Table V reports the results from estimating Equation (2). For each dependent variable, we first present results controlling for borrower characteristics and fixed effects. We then control for the percentage of foreign participants in the syndicate and loan contract terms. The capital regulation gap between participants and lead arrangers is positively associated with loan spreads. The estimation (Column (2)) suggests that a one standard deviation increase in the regulatory gap is associated with 5 basis points higher interest rate spreads on the loan contract. The presence of foreign participants, measured by *%Foreign Participants*, is also associated with riskier loans. A one standard deviation increase in foreign participation (35%) is associated with a 17 basis points increase in spreads. The regulatory gap between participant and lead lenders is also associated with lower lending standards, as evidenced by lower covenant usage and higher default rates. Our estimates suggest that a one standard deviation increase in the regulatory gap is associated with a 3% reduction in the inclusion of restrictive covenants and 10% higher default rates relative to the sample mean.[14]

These results are consistent with our argument that strictly regulated banks participate in loan deals that deliver higher returns but also carry greater credit risk.

5.2 Real Effects on Borrowers

We explore the real effects of global syndication by examining how the investment, sales, and employment of borrowers respond to the capital regulation stringency of foreign participant banks. For this analysis, we first fix a borrower–lead lender pair that has repeated long-term relationships. For each borrower–lead arranger pair and a year of observation, we trace back previous loan syndicates originated by the lead bank and identify foreign countries whose banks previously participated in those syndicates. We consider those countries as the lead bank's "participant countries." If those countries have stricter capital regulation standards, we expect that their banks are more likely to invest in the lead lender's deals, thus facilitating the access to credit by the relationship borrower. We thus estimate the following model:

14 The magnitude calculations are as follows. A one standard deviation of capital stringency gaps (2.09) is associated with an increase in spread of 4.9 bps ($= 2.35 \times 2.09$). It is also associated with a reduction in covenant usage of 0.88 percentage points ($= 0.42 \times 2.09$), which is around 3% of the sample average level. Finally, the same increase in regulatory gaps is associated with 0.3 percentage points higher default rates ($= 0.147 \times 2.09$), which is about 10% of the sample mean (3 percentage points).

$$Y_{f,i,t} = \gamma_1 Participant\ Stringency_{f,i,t-1} + \gamma_2 BorrowerChar_{f,t} + \zeta_f + \phi_i + \kappa_{m,t} + \xi_{i,t} + \epsilon_{f,i,t}, \quad (3)$$

where i indicates the lead lender that has a long-term relationship with borrower f, $Y_{f,i,t}$ includes borrowers' investment as measured by capital expenditures over total assets, the log of sales, and the log of employment. *Participant Stringency* is the average stringency of the lead lender's participant countries in the previous year ($t - 1$). The regression includes borrower (ζ_f), lead lender (ϕ_i), borrower industry–year ($\kappa_{m,t}$), and lead country–year ($\xi_{i,t}$) fixed effects. To the extent that more funding from foreign participants improves a firm's access to debt financing, we conjecture that borrowers should increase their investment, expand employment, and observe increased sales, that is, $\gamma_1 > 0$.

Table VI reports the results. Estimates in Panel A suggest that a one standard deviation increase in the participant stringency is associated with an 18% increase in investment, 8% higher sales, and 13% higher employment. The economic magnitudes of these effects are sizable considering the fixed effects we impose in the estimation. Panel B further shows that the improvement in sales and employment are concentrated on high-risk borrowers, indicated by the borrower having a speculative rating or no ratings. These results suggest that strict capital regulations may trigger increases in cross-border lending, affecting the policies, and growth of risky firms abroad.

Our evidence so far suggests that loosely regulated banks originate loan syndicates lending to riskier and more opaque borrowers and strictly regulated banks participate in those syndicates. Global syndicates involving loosely regulated lead lenders and heavily regulated participants also charge high-interest rates, are less likely to include loan covenants, and face a high default rate. These results support the argument that strictly regulated banks participate in syndicates originated by less regulated lead arrangers in pursuit of risky investment. Notably, this type of syndication behavior also facilitates the access to credit for risky firms. As such, our findings suggest that banks' incentives to evade domestic regulation can significantly influence the availability and the cost of credit for corporate borrowers.

5.3 Participant Banks' Incentives

How do strictly regulated banks benefit from participating in foreign-led syndicates? In this section, we investigate the possibility that global syndication allows strictly regulated banks to partake in profitable deals and have greater discretion in reporting the credit risk associated with such deals. We do so examining the heterogeneity in banks' participation rates according to various country and bank characteristics.

We consider two characteristics of the participant country, banks' accounting standards and the quality of regulation enforcement. Higher accounting standards suggest that banks are required to publish standardized and transparent financial statements, which can reduce the information asymmetry faced by regulators in assessing banks' risk exposure and inhibit banks' ability to manipulate their reporting of asset risks or loan losses. As such, higher accounting quality should reduce benefits of global syndication. Information on the accounting quality of a country's banking system comes from the survey conducted by Barth, Caprio, and Levine (2004).[15] We define an indicator for low accounting standards,

15 Accounting transparency is measured by a composite score consisting of six criteria: (1) banks are required to prepare consolidated accounting statements, (2) accrued interests and principals

Table VI. Real effects of participants' capital regulation

This table shows the effects of the capital regulation stringency of participant bank countries on corporate policies of the public borrowers. The test uses a borrower–lead lender–year panel. The sample only includes publicly traded borrower–lead lender pairs that have multiple loans and the relationship extends more than 4 years. The variable of interest is *Participant Stringency*, the average stringency of capital regulation from potential syndicate participants. For each lead lender, we identify its prospective participants as banks that have participated in loans initiated by the lead lender to public firms during the previous year. *Participant Stringency* is lagged by 1 year. Panel A examines the average effect of capital stringency on borrowers' operating policies, and Panel B examines the interactive effect of capital stringency and borrower risk. *High Risk* indicates borrowers without credit ratings or with a speculative-grade rating. In both panels, the dependent variable for Column (1) is borrowers' investment, the log of sales for Column (2), and the log number of employees for Column (3). All regressions include borrower, lead bank, industry–year, and lead country–year fixed effects. Controls include borrower size, profitability, and market-to-book. Standard errors are clustered by borrower. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Changes in borrowers' policies

Dep. Var.:	*Investment* (1)	*Sales* (2)	*Employment* (3)
Participant Stringency	0.005**	0.035**	0.058**
	(2.22)	(2.20)	(2.20)
Controls	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes
Lead bank FE	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
Lead country × Year FE	Yes	Yes	Yes
Observations	19,708	19,775	18,562
Adjusted R^2	0.775	0.989	0.984

Panel B: Interactive effects with borrower risk

Dep. Var.:	*Investment* (1)	*Sales* (2)	*Employment* (3)
Participant Stringency	0.005**	–0.000	0.032
	(2.16)	(–0.01)	(1.15)
Participant Stringency × *High Risk*	0.000	0.028***	0.018*
	(0.06)	(3.63)	(1.67)
High Risk	–0.005	–0.178***	–0.137**
	(–1.36)	(–4.73)	(–2.44)
Controls	Yes	Yes	Yes
Borrower FE	Yes	Yes	Yes
Lead bank FE	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
Lead country × Year FE	Yes	Yes	Yes
Observations	19,708	19,775	18,562
Adjusted R^2	0.776	0.989	0.984

Low Accounting Quality, which equals to one if a country's accounting standards falls to the bottom tercile of the sample.

In countries with weak regulation enforcement, banks may expect less pressure and infrequent audits from regulators in producing accurate report of their credit risk exposure. When facing binding capital requirements, banks in those countries are more likely to manipulate the default risks of their syndicated loans. As such, global syndication should be more attractive to banks in weak-enforcement countries than to those in strong-enforcement countries. We measure the quality of regulation enforcement using two indicators from the Worldwide Governance Indicator database: "regulatory quality" and "rule of law" (Kaufman, Kraay, and Mastruzzi, 2011). We create a dummy variable, *Weak Governance*, that equals one if either a country's regulatory quality index or its rule of law index falls into the bottom tercile of the sample. We expect *Weak Governance* to strengthen the relation between capital stringency gaps and cross-country syndication.

We further consider two characteristics of the participant bank: capital adequacy and recent default experiences. If a bank facing stringent capital regulations is also short on capital reserves, it should have a greater incentive to seek high-yield deals. Accordingly, we expect that participant banks with low Tier 1 capital should have a greater tendency to participate in syndicates led by less regulated banks. *Low Tier 1 Capital* is defined as an indicator that equals one if a participant bank's Tier 1 capital is at the bottom tercile of the sample. In contrast, banks that have recently experienced a default arising from the syndicated loans in their portfolio become more risk-averse and tighten future lending standards (e.g., Murfin, 2012). We thus expect that banks with recent default experiences are less likely to seek risky lending opportunities outside the border.[16] *Recent Default* is an indicator that turns to one if a bank's borrower is downgraded to default status during the previous year.

We regress syndication activities on the full interaction between the capital regulation gaps (Δ*Capital Stringency*) and the above-mentioned characteristics, and expect the interaction term to generate positive coefficients for *Low Accounting Quality*, *Weak Governance*, and *Low Tier 1 Capital*, but negative for *Recent Default*

Table VII reports the results from the above interaction tests. The interactive terms of capital regulation gaps with both *Low Accounting Quality* and *Weak Governance* generate positive coefficients. These results suggest that a country's accounting transparency and its ability to enforce regulations can effectively prohibit banks' attempts to circumvent capital regulations through global syndication. The interactive effects of *Capital Stringency* and bank-level characteristics further shed light on the banks' motives to participate in foreign-led syndication. The results suggest that capital-constrained banks have more incentives to invest in global syndicated loans, while banks with recent default experiences refrain from such investments.

of performing loans enter banks' income statements, (3) accrued interests and principals of non-performing loans do not enter income statements, (3) banks need to disclose off-balance sheet items, (5) banks need to disclose governance and risk management framework, and (6) bank directors are legally liable for publishing erroneous or misleading information.

16 We note that recent default experiences in the syndicated loans market do not necessarily translate to lower capital reserves, which reflect cumulative earnings and financing activities from the past at the bank level. Losses from a default event can be offset by gains from other loans, other types of assets in banks' portfolio, and earnings in previous years. Empirically, we do not find a clear relation between recent default and capital reserves in our sample.

Table VII. Participant banks' incentives

This table shows the heterogenous participation rates based on characteristics of participant countries and banks. The dependent variable is %*Syndicate*. The regressions examine the interaction effect of capital regulation gaps with accounting standard in the participant country (*Low Accounting Quality*) in Columns (1) and (2) and with law enforcement in the participant country (*Weak Governance*) in Columns (3) and (4). Columns (5) and (6) examine the interaction effect of capital regulation gaps participant banks' capital inadequacy (*Low Tier 1 Capital*). Columns (7) and (8) examine the response of the participant banks that recently have experienced loan default (*Recent Default*). The definitions of all variables are provided in Appendix A. Controls include the same set of variables as in Columns (7) and (8) in Table III. Standard errors are clustered by country–pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: %*Syndicate*	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ*Capital Stringency* ×	0.162***	0.162***						
Low Accounting Quality	(3.22)	(3.11)						
Low Accounting Quality	0.343**	0.386***						
	(2.51)	(2.84)						
Δ*Capital Stringency* ×			0.075**	0.065*				
Weak Governance			(2.31)	(1.70)				
Weak Governance			–0.149	–0.101				
			(–0.90)	(–0.60)				
Δ*Capital Stringency* ×					0.056	0.086**		
Low Tier 1 Capital					(1.43)	(2.04)		
Low Tier 1 Capital					0.474***	0.420***		
					(4.86)	(4.28)		
Δ*Capital Stringency* ×							–0.085**	–0.065*
Recent Default							(–2.24)	(–1.84)
Recent Default							–0.263***	–0.137
							(–2.63)	(–1.51)
Δ*Capital Stringency*	0.025	0.016	0.021	0.016	0.014	–0.001	0.067***	0.056***
	(1.07)	(0.69)	(0.81)	(0.56)	(0.48)	(–0.03)	(3.40)	(2.77)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lead and participant bank FE	Yes	No	Yes	No	Yes	No	Yes	No
Bank–pair FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	618,131	617,451	573,441	571,517	219,383	218,189	618,131	617,451
Adjusted R^2	0.175	0.124	0.173	0.116	0.158	0.132	0.175	0.123

Taken together, our cross-sectional analyses point to institutional environments and individual bank characteristics that can modulate the relation between cross-country regulatory gaps and global syndicate participation. These analyses help reveal banks' risk-taking motives and the mechanisms through which they may evade regulatory pressure.

5.4 Implications for Banks' Systemic Risk

As banks extend loans to risky borrowers abroad, a natural question emerges as to whether this lending practice exposes banks to greater systemic risk. We attempt to address this question by examining market-based measures of systemic risk, which reflect changes in banks' risk exposure in a timely manner.[17] In particular, we examine banks' *LRMES*, average daily volatility (*DVar*), estimated beta of banks' equity returns to the MSCI world index (*Beta*), and the correlation between equity returns and the world index (*Corr*). We aggregate all risk measures at an annual frequency.

We examine how global syndicated lending relates to the risk exposure of both participant and lead banks. For participants, we first gauge the extent to which a bank participates in global syndication using *Global Participation Ratio*, the amount of funds that the bank contributes to foreign-led syndicated loans scaled by its total amount of contribution to syndicated loans during a year. We then regress systemic risk measures on the full interaction of *Global Participation Ratio* with Δ*Capital Stringency* (*Own* − *Lead*), the difference between the capital stringency faced by the bank and the average capital stringency across its foreign lead arrangers. This interaction term suggests the extent to which banks participate in syndicates of less regulated lead arrangers.

For lead arrangers, we construct a measure, *Global Lead Ratio*, as the value of syndicated loans that a bank originates with foreign participants scaled by the total amount of loans it originates in a given year. We examine the interactive effect of *Global Lead Ratio* and Δ*Capital Stringency* (*Participant* − *Own*), that is, the capital stringency gap between the bank and its foreign participants. This interaction reflects the extent to which a lead bank sources capital from more strictly regulated participants. Our analyses sample on banks that have syndicated with foreign banks in the previous year. All independent variables are lagged by 1 year.

Table VIII reports the results. Panel A presents the results for participant banks, and Panel B presents the results for lead banks. Results suggest that participant banks face greater exposure to systemic risk when they participate more in syndicates led by banks from less regulated countries. Lead banks also face greater risk exposure when they include strictly regulated participants in the syndicates they originate, as indicated by the positive coefficients on Δ*Capital Stringency* × *Global Lead Ratio*. These results generate consistent interpretations with our loan-level analyses, that is, global syndication is associated with riskier lending practices and potentially exposes banks to higher systemic risk.

Our findings complement those in Karolyi, Sedunov, and Taboada (2018), who show that cross-border lending reduces the systemic risk exposures of banks in the host country due to increased competitive pressure. The differences in results may arise from the fact that syndication represents a cooperative form of lending. Participating in a global syndicate may not intensify competition in the lead lender's country but instead provide support for the investment decisions made by the lead lender.

6. Endogeneity Concerns

Our baseline estimations generate findings consistent with capital regulation gaps affecting global syndication structures. However, concerns remain that omitted variables or reverse causality could confound our findings. We address these potential concerns in this section.

17 We thank the New York University V-Lab for sharing measures of systemic risks with us.

Table VIII. Global syndicated lending and banks' systemic risk

This table shows the effects of the global syndicated lending on the systemic risks of participant banks and lead banks. The test uses a bank–year panel, sampling on all publicly traded banks that have nonmissing systemic risk measures provided by the NYU V-Lab and have led or participated in at least one globally syndicated loans in the previous year. In Panel A, the bank of interest is a bank participating in foreign-led global syndicates. Δ*Capital Stringency* is computed as the difference between the bank's own country's capital stringency and the average capital stringency faced by the lead arrangers of syndicates in which the bank participates in a year. *Global Participation Ratio* is the ratio of the amount of globally syndicated loans that the bank participates in scaled by the total amount of loans in which the bank participates in a given year. In Panel B, the bank of interest is a lead bank. Δ*Capital Stringency* is computed as the difference between the average participant banks' capital stringency and the bank's own country's capital stringency. *Global Lead Ratio* is the ratio of the amount of globally syndicated loans that the bank originates scaled by the total amount of loans that the bank originates in a given year. In each panel, the dependent variable is the *LRMES* in Column (1), the average daily variance of a bank (*DVar*) in Column (2), a bank's beta relative to the MSCI world index in Column (3), and a bank's equity price correlation with the MSCI world index (*Corr*) in Column (4). All regressions include bank and year fixed effects. Independent variables are lagged by 1 year. Standard errors are clustered by bank. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Effects on participant banks

Dep. Var.	(1) *LRMES*	(2) *DVar*	(3) *Beta*	(4) *Corr*
Δ*Capital Stringency* × *Global Participation Ratio*	0.0173**	0.0000	0.0523*	0.0194**
	(2.10)	(0.09)	(1.93)	(2.06)
Δ*Capital Stringency* (Own – Lead)	–0.0195**	–0.0000	–0.0618**	–0.0197**
	(–2.42)	(–0.31)	(–2.37)	(–2.14)
Global Participation Ratio	–0.0045	–0.0001	–0.0111	0.0020
	(–0.84)	(–1.47)	(–0.63)	(0.40)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	3,327	3,327	3,327	3,327
Adjusted R^2	0.781	0.404	0.750	0.905

Panel B: Effects on lead banks

Dep. Var.	(1) *LRMES*	(2) *DVar*	(3) *Beta*	(4) *Corr*
Δ*Capital Stringency* × *Global Lead Ratio*	0.0391***	0.0005***	0.1271***	0.0087
	(3.15)	(3.19)	(3.02)	(0.84)
Δ*Capital Stringency* (Participant – Own)	–0.0370***	–0.0005***	–0.1178***	–0.0090
	(–2.97)	(–3.08)	(–2.76)	(–0.87)
Global Lead Ratio	0.0083	–0.0000	0.0315*	0.0137***
	(1.62)	(–0.82)	(1.83)	(2.71)
Bank FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	2,467	2,467	2,467	2,467
Adjusted R^2	0.796	0.401	0.761	0.909

First, we assess the extent to which borrower-side characteristics may influence our findings by controlling for borrower–year fixed effects. We next address a reverse causality issue using an IV-based estimation. We discuss these analyses in turn.

6.1 Controlling for Borrower-Side Dynamics

One concern regarding our baseline results is that the relation between capital regulation gaps and global syndication activities can be driven by unobservable borrower-side conditions such as credit demand or credit quality. To account for such possibilities, we design a test to examine banks' participation decisions while controlling for time-varying borrower conditions.

We start by constructing a borrower–year panel, including all borrowers in DealScan during years when they receive at least one syndicated loan. We require the syndicated deal to have face value larger than $100 million, which restricts our sample firms to those with sizable credit demand that is likely to necessitate global syndication. We then expand the sample to a borrower–year–country panel to compare the participation of all foreign banks that are potential syndicate partners. Foreign banks are defined as those located outside the countries of the borrower and the lead lender.

We examine the relation between a country's capital stringency and its banks' participation rates in a syndicated loan using the following model:

$$Participate_{f,j,t} = \theta_1 Capital\ Stringency_{j,t} + \theta_2 Controls + \Gamma_{f,t} + \nu_{f,j,t}, \quad (4)$$

where f indicates the borrower firm, j indicates a potential participant country, and t stands for the year. $Capital\ Stringency_{j,t}$ stands for the capital stringency of country j in year t. $Participate_{f,j,t}$ is an indicator variable that equals one if any bank in country j is a syndicate participant in at least one of the loans extended to borrower f during year t. *Controls* include the same set of controls in the baseline analyses.[18]

The key feature of this test is that we control for borrower–year fixed effects ($\Gamma_{f,t}$) to fix the credit conditions of the borrower. We further introduce lead–country–year fixed effects to hold constant the regulation faced by the lead arranger. If banks under strict capital regulations are incentivized to syndicate abroad, we expect that $\theta_1 > 0$.

Panel A of Table IX reports the results of this analysis. Capital stringency bears a positive and significant coefficient. The estimates from Column (2) suggest that a one standard deviation increase in the stringency of capital regulation is associated with an approximately 0.7 percentage point increase in syndicate participation rates, a 14% increase relative to the sample mean (4.8 percentage points). This result confirms our baseline finding that banks under stringent capital regulations are more likely to participate in foreign-led syndicated loans and that this finding is unlikely to be driven by borrower-side credit demand.

6.2 An IV Estimation

We discuss a reverse causality concern that global syndication activities may influence the differences in capital regulations across countries. Admittedly, it is challenging to find perfectly exogenous shocks to capital regulations. We attempt to alleviate this concern using

18 Pairwise variables such as *Distance*, *Common Language*, and *Bilateral Trade* are redefined to be the maximum level of the value between the participant and the lead countries, and that between the participant and the borrower countries.

Table IX. Alleviating endogeneity concerns

This table reports results that help alleviate concerns that the baseline findings are driven by borrower-side conditions or reverse causality. Panel A examines the participation of banks in a global syndicate while holding fixed borrower-side conditions. The sample is a borrower–year–country panel, including all borrowers in DealScan that obtain at least one syndicated loan with face value over $100 million in a given year. We sample all the countries outside of the borrower's location and the lead lender's country and treat banks in those countries as potential foreign participants. The dependent variable is *Participate*, a dummy variable that equals one if at least one bank in a given country participates in the syndicated deal extended to a given borrower during a given year. Controls include the GDP per capita, GDP growth, exchange rate return, and the interest rate in the *participant* bank's country. We also control for the maximum distance between the borrower and the lead lender and between the borrower and the participant bank, whether the lead lender, participant, and the borrower countries share the same language, and the bilateral trade between lead and participant countries. All regressions include borrower–year fixed effects. Column (2) additionally includes lead–country–year fixed effects. Standard errors are clustered by lead country. Panel B shows the results from IV regressions (two-stage least square). The regressions are conducted on a bank–pair–year panel. The dependent variable in the first stage is Δ*Capital Stringency*, and the dependent variables in the second stage are *Syndicate* and %*Syndicate*. $\Delta\widehat{Capital\ Stringency}$ indicates the difference in capital regulatory stringency between two countries that is predicted from the first stage. The instruments include between-country differences in income inequality (measured by the Gini index), the percentage of years of that a country has been independent since 1776, the number of banking crisis in its history, and the percentage of government ownership of banks. Controls include the same set of control variables as Columns (4) and (8) in Table III. Standard errors are clustered by country–pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: Controlling for borrower-side conditions

Dep. Var.: *Participate*	(1)	(2)
Capital Stringency	0.003***	0.003***
	(4.68)	(5.41)
Controls	Yes	Yes
Borrower × Year FE	Yes	Yes
Lead country × Year FE	No	Yes
Observations	1,765,937	1,765,867
Adjusted R^2	0.118	0.119

Panel B: Instrumental-variable approach

Dep. Var.:	(1) *Syndicate*	(2) %*Syndicate*
$\Delta\widehat{Capital\ Stringency}$	0.013***	0.192***
	(2.74)	(3.31)
Year FE	Yes	Yes
Bank–pair FE	Yes	Yes
Hansen's *J*-statistics (*p*-value)	0.70	0.91
LM statistics (*p*-value)	<0.01	<0.01
F-statistics (*p*-value)	<0.01	<0.01
Observations	460,577	460,577

an IV-based estimation. Following previous literature (Houston, Lin, and Ma, 2012; Karolyi and Taboada, 2015), we select instruments that reflect historical and social traits of a country. These variables include the income inequality of a country, the percentage of years that a country has been independent since 1776, the number of banking crises occurring in a country's history, and the government ownership of banks.

Using these instruments, we conduct two-stage least squares regressions. In the first stage, we regress the differences in capital regulation on the differences in IVs between two countries. In the second stage, we regress syndication activities on the capital regulation differentials that are predicted by the first stage. Panel B of Table IX presents the results from the second stage. The IV approach yields similar results as our baseline estimations, with the predicted differences in capital regulation ($\Delta \widehat{Capital\ Stringency}$) yielding positive and statistically significant coefficients for syndication activities. These results confirm our argument that strictly regulated banks are more likely to participate in global lending syndicates originated by less regulated lead banks.

7. Discussion and Robustness

7.1 Other Channels of Cross-Border Lending

We discuss the tradeoffs banks face between various forms of cross-border investments. Banks can direct their capital overseas through several channels, including syndicated and nonsyndicated lending, lending through foreign subsidiaries, and investing in corporate bond markets. Although syndicated loans represent one of several types of foreign investments, they account for a major component of total cross-border lending, especially to corporate clients (see, e.g., Ivashina and Scharfstein, 2010; Cerutti, Hale, and Minoiu, 2015).

From the lender's perspective, syndication offers at least two advantages over direct, nonsyndicated lending. First, syndication allows banks to gain exposure to a foreign borrower without having to interact with the firm, negotiate deal terms, or monitor the firm throughout the course of the loan. These tasks can be costly given that the borrower is located in a different country, exposed to distinct economic conditions, and subject to different accounting and institutional environments. Through syndication, banks can rely on a local lead lender who has developed expertise for these tasks.

While we do not observe all the nonsyndicated loans made by our sample banks, we verify this argument by looking into banks' choice between originating a syndicated loan to a foreign firm and participating in a lending syndicate to the same borrower. We test this using a borrower-level sample similar to that used in Section 6.1. For each borrower–year observation, we only include foreign countries in which at least one bank lends to the borrower in that year, either as a lead arranger or as a participant. This allows us to hold constant borrower-side conditions and compare banks' decisions between leading vis-à-vis participating in a foreign syndicate. We code a variable, *Participate*, to be one if a bank is a syndicate participant in lending to the borrower and zero if the bank is a lead arranger. We then regress this indicator variable on the capital stringency in the bank's country. Panel A of Table X shows that strictly regulated banks are more likely to join a foreign-led syndicate as a participant rather than to directly extend a cross-border loan as a lead arranger. This evidence is consistent with our argument that it could be costly to lead arrange a loan to a foreign borrower.

Second, syndication provides a way for banks to access a foreign market without having to directly compete against local lenders in that market. The corporate loan market is often

Table X. Robustness: syndication roles, foreign subsidiaries, and lenders' shares

This table displays additional robustness results. Panel A shows a bank's choice between leading a syndicated loan to a foreign firm and participating in a foreign-led syndicate. The sample is a borrower–year–country panel that includes the borrower–year observations only when the borrower obtains at least one syndicated loan in that year. We sample only on banks that are either lead arrangers or syndicate participants to the borrower of interest. The dependent variable is *Participate*, an indicator variable that equals one if banks from a country participate in a given loan while no bank from that country is the lead lender and zero if one of its banks is the lead arranger. The variable of interest is *Capital Stringency*, the capital stringency faced by the country of interest. Controls include the GDP per capita, GDP growth, exchange rate return, and interest rate of lender country, and the geographic distance between borrower and lender country, the indicator that equals to one if borrower and lender countries share the same language, and the bilateral trade between borrower and lender countries. Panel B reports results when we control for whether the lead bank has a subsidiary in the participant's country (*Lead Subsidiary*) and whether the participant bank has a subsidiary in the lead lender's country (*Participant Subsidiary*). Controls include the same set of variables in Table III. In Columns (3) and (4), we remove observations where participant banks and lead arrangers have subsidiaries in each other's country. Panel C shows results from *Syndicate Share*, the percentage of capital contributed by a participant bank to syndicated loans originated by a lead bank in a given year. Controls include the same set of variables in Table III. The definitions of all variables are provided in Appendix A. Standard errors are clustered by country in Panel A, and by country–pair in Panels B and C. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A: The choice between leading and participating

Dep. Var.: *Participate*	(1)	(2)
Capital Stringency	0.002**	0.010***
	(2.55)	(9.39)
Controls	Yes	Yes
Borrower × Year FE	Yes	Yes
Bank country FE	No	Yes
Observations	127,314	111,097
Adjusted R^2	0.500	0.535

Panel B: Controlling for foreign subsidiaries

	(1)	(2)	(3)	(4)
Dep. Var.:	*Syndicate*	*%Syndicate*	*Syndicate*	*%Syndicate*
Sample:	Full	Full	No subsidiary	No subsidiary
Δ*Capital Stringency*	0.004**	0.051**	0.003**	0.049**
	(2.30)	(2.44)	(2.35)	(2.44)
Lead Subsidiary	0.050***	0.410***		
	(8.50)	(6.67)		
Participant Subsidiary	0.075***	1.179***		
	(11.07)	(9.07)		
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Bank–pair FE	Yes	Yes	Yes	Yes

(continued)

Table X. Continued

Panel B: Controlling for foreign subsidiaries				
	(1)	(2)	(3)	(4)
Dep. Var.:	*Syndicate*	*%Syndicate*	*Syndicate*	*%Syndicate*
Sample:	Full	Full	No subsidiary	No subsidiary
Observations	618,131	618,131	373,760	373,760
Adjusted R^2	0.238	0.176	0.229	0.0986

Panel C: Syndicate shares		
Dep. Var.: *Syndicate Share*	(1)	(2)
Δ*Capital Stringency*	0.012**	0.011***
	(2.07)	(2.59)
Controls	Yes	Yes
Year FE	Yes	Yes
Lead and participant bank FE	Yes	No
Bank–pair FE	No	Yes
Observations	92,406	78,747
Adjusted R^2	0.398	0.515

highly concentrated and dominated by a few lead arrangers.[19] This presents a significant barrier for new entry, especially for foreign banks. Consistent with this argument, our cross-sectional results in Panel C of Table IV suggest that strictly regulated banks are more likely to partner with market leaders.

Aside from participating in the syndicated loans market, banks can extend corporate loans through their foreign subsidiaries. Having a foreign subsidiary helps reduce the information asymmetry between banks and borrowers in that country. It also gives banks a better access to external capital markets in that country (Bank for International Settlements, 2010). Yet, subsidiary lending also faces limitations. Subsidiaries are legally separate entities from their parent banks and are subject to regulations regarding capital adequacy and loan concentration limits (see, e.g., Basel Committee on Banking Supervision and Bank for International Settlements, 2000). Due to these constraints, subsidiaries generally have a smaller balance sheet and a lower capacity to solely support large, corporate loans. Consistently, Cerutti, Dell'Ariccia, and Martínez Pería (2007) show that foreign subsidiaries are more focused on retail banking than corporate lending. In addition, parent banks extract lending profits from their foreign subsidiaries through dividend payout and repayment of intra-group loans. Such repatriation of profits requires their subsidiaries to be overall profitable or at least financially sound. Syndicated lending by the parent bank or their foreign branches does not face these limitations. In Panel B of Table X, we control for the effect of banks having foreign subsidiaries. In Columns (1) and (2), we include indicators for whether the participant bank and the lead arranger have subsidiaries in each other's country. In Columns (3) and (4), we remove those observations from the sample. Our result persists.

19 In our sample, the top three banks in a country possess over 80% of the market share in terms of loan origination volume. See Ross (2010) for evidence on the concentration of US syndicated loans market.

Finally, banks can also invest in corporate bond markets, which do not require monitoring or interfacing with borrowers. However, as investors of publicly traded debt securities, banks cannot rely on the screening abilities of a lead arranger. This gives them little information advantage over regulators at their home countries regarding borrower conditions.[20] Importantly, investing in bond markets prevents banks from deriving surplus from lead lenders' market power. Banks thus generate lower returns from corporate bonds than from loans (Schwert, 2020).[21] Thus, banks facing strict capital regulations are likely to consider syndicated loans as more desirable investments than corporate bonds.

In the meanwhile, we note that syndicated lending also has its drawbacks. Compared to direct lending, syndication requires banks to communicate with a lead arranger in a different country. This exposes banks to greater informational and cultural frictions (Giannetti and Yafeh, 2012). When facing strict capital regulations, banks trade-off the benefits from participating in global lending syndicates against the frictions in coordinating with a foreign lead arranger.

7.2 Robustness Checks

We conclude our investigation by testing the robustness of our baseline findings. In particular, we examine an alternative measure of syndication activities and the addition of other controls for country characteristics. In Appendix B, we further test the effects of other risk-inducing bank regulations on global syndicate structures.

Our measures of syndication activity rely on counting the number of loans instead of the dollar amount contributed by each participant bank. This is because DealScan provides only sparse information regarding lenders' shares (for only 27% of deals). Nevertheless, with the information available, we construct an alternative measure of syndication activity using the amount of capital contributed by participant banks. Accordingly, we define *Syndicate Share* as the percentage of loan amounts originated by a lead bank that is contributed by a certain participant bank in a given year. Panel C of Table X shows that our results persist with this alternative measure.

We also test the robustness of our results to the addition of more country-level controls.[22] In Table XI, we include measures that capture the differences between lead and participant countries with respect to economic and legal conditions. This includes business cycle variables such as inflation rates and annual stock market returns. We also include an indicator for whether the participant and lead countries share the same origin of laws (i.e., civil or common law systems). Finally, we control for the effectiveness of legal systems including the rule of law, the efficiency of a country's judicial system in enforcing contracts, and the efficiency in resolving insolvency. Our results are robust to these controls.

20 The Volker Rule has further restricted US banks' ability to use private information when investing in corporate bond markets.

21 Based on US data, banks do not seem to actively participate in bond markets. Only 5% of corporate bonds are held by commercial banks (Campbell and Taksler, 2003). Corporate bonds (together with other, nonloan debt securities) also only account for 0.8% of the total banking assets in our sample period. This stands in contrast to commercial and industrial loans, which account for 9% of total assets.

22 We do not include these variables in the baseline specification because the availability of some of the additional controls limits the coverage of our sample.

Table XI. Robustness: additional country-level controls

This table displays robust results in the baseline specification in Table III when additional country-level variables are controlled for. The dependent variable is *Syndicate* in Columns (1) and (2) and %*Syndicate* in Columns (3) and (4). The definitions of all variables are provided in Appendix A. Standard errors are clustered by country–pair. Regressions shown in Columns (1) and (3) include lead and participant bank fixed effects, while those in Columns (2) and (4) include bank–pair fixed effects. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.	*Syndicate*		*%Syndicate*	
	(1)	(2)	(3)	(4)
Δ*Capital Stringency*	0.004**	0.003*	0.041**	0.032*
	(2.33)	(1.82)	(2.37)	(1.79)
Δ*GDP per Capita*	0.005	0.007	–0.132	–0.110
	(0.44)	(0.56)	(–1.03)	(–0.78)
Δ*GDP Growth*	0.167***	0.144***	0.974	0.366
	(3.24)	(2.79)	(1.47)	(0.55)
Δ*Exchange Rate Return*	0.012	0.012	0.432*	0.418*
	(0.76)	(0.74)	(1.90)	(1.83)
Δ*Interest Rate*	0.038	0.030	1.755***	1.605***
	(1.58)	(1.24)	(3.95)	(3.73)
Distance	–0.066***		–0.704***	
	(–17.07)		(–13.71)	
Common Language	0.036***		0.213*	
	(3.07)		(1.79)	
Bilateral Trade	0.001		0.037	
	(0.02)		(0.08)	
Same Law Origin	–0.016***		–0.099	
	(–2.89)		(–1.63)	
Δ*Inflation*	–0.361***	–0.333***	–4.331***	–4.347***
	(–4.14)	(–3.75)	(–3.95)	(–3.95)
Δ*Stock Return*	–0.003	–0.002	–0.027	–0.029
	(–0.43)	(–0.29)	(–0.28)	(–0.30)
Δ*Rule of Law*	0.005	0.007	–0.219	–0.261
	(0.40)	(0.54)	(–1.24)	(–1.43)
Δ*Enforcing Contract*	–0.002	–0.003*	–0.050***	–0.054***
	(–1.63)	(–1.87)	(–2.82)	(–2.89)
Δ*Resolving Insolvency*	–0.003*	–0.002	0.047***	0.047***
	(–1.87)	(–1.57)	(2.73)	(2.63)
Year FE	Yes	Yes	Yes	Yes
Lead bank FE	Yes	No	Yes	No
Participant bank FE	Yes	No	Yes	No
Bank–pair FE	No	Yes	No	Yes
Observations	566,185	561,886	566,185	561,886
Adjusted R^2	0.245	0.338	0.151	0.149

8. Conclusion

Global syndication is a common practice in the market for corporate loans and is increasing in popularity over time. We find that capital regulation gaps across countries shape the structure of global lending syndicates. Specifically, strictly regulated banks participate more in syndicates initiated by less regulated lead banks. Through syndication, banks can rely on a lead lender's expertise in generating risky, but profitable deals in a foreign country. They also have greater discretion in reporting the credit risk associated with those deals, thus evading regulatory pressure.

Our study is the first to examine how regulatory gaps across countries can shape global syndicate structures. Our results suggest that banks can strategically choose syndicate partners to benefit from the capital regulation regimes they face. These findings not only suggest a novel determinant of global syndication, but also generate important implications for corporations' access to capital and banks' systemic risk exposure. By participating in foreign-led syndicates, banks under strict regulations direct their capital to fund high-risk corporate activities. In the meanwhile, they expose themselves to greater systemic risk. As such, global syndication driven by cross-country regulatory gaps engenders an economically important effect on the stability of banking systems.

Appendix A: Variable Definitions

Syndication Activity (Source: DealScan)

$Syndicate_{i,j,t}$: Indicator variable equal to one if there is more than one syndicated loan issued in which bank i is the lead lender and bank j is a participant in year t and zero otherwise.

$\%Syndicate_{i,j,t}$: The number of loans issued between two banks in which bank i is the lead lender and bank j is the participant in year t as a proportion of the total number of loans led by bank i in year t. This variable is presented in percentage points.

Bank Regulations (Source: Barth, Caprio, and Levine, 2013)

Capital Stringency: Index that measures the stringency of regulations on the capital reserve banks must hold and on the sources of funds that count as regulatory capital. A higher value indicates greater stringency.

Entry Requirement: Index that measures the extent to which various types of legal submissions are required to obtain a banking license. A higher value indicates greater stringency to limit competition.

Funding Insured: Percent of the commercial banking system's assets is funded with insured deposits. A higher value indicates a higher degree of moral hazard.

Country-Level Control Variables

GDP per Capita: Log of real GDP per capita in US dollars. (Source: World Bank)

GDP Growth: The annual real growth rate of GDP. (Source: World Bank)

Exchange Rate Return: The annual real exchange rate return of local currency to the US dollar, deflated using the Consumer Price Index (2,000 constant). (Source: World Bank)

Interest Rate: A central bank policy rate. Replaced with a discount rate at which commercial banks can borrow from the central bank if missing. (Source: IMF International Financial Statistics)

Distance: Log of circle distance between the capital cities of two countries.

Common Language: Indicator variable equal to one if the two countries share the same language and zero otherwise. (Source: World Bank)

Bilateral Trade: Maximum of bilateral imports and exports between lead and participant countries. Bilateral imports (exports) are calculated as the total value of imports (exports) by a lead country from a participant country as a proportion of total imports by the lead country. (Source: IMF's Direction of Trade Statistics)

Same Law Origin: Indicator variable equal to one if the two countries share the same legal origin (civil vs. common law) and zero otherwise. (Source: Djankov et al., 2008)

Inflation: Annual percentage change in the consumer price index. (Source: World Bank)

Stock Return: The growth rate of annual average stock market index. (Source: World Bank—The Global Financial Development Database)

Rule of Law: The governance index that captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. (Source: Kaufmann, Kraay, and Mastruzzi, 2011)

Enforcing Contract: The index that captures the ease of enforcing contracts, which averages the scores of the time and cost for resolving a commercial dispute through a local first-instance court, as well as the quality of judicial processes that promotes quality and efficiency in the court system. (Source: World Bank—Doing Business)

Resolving Insolvency: The index that captures the ease of resolving insolvency, which averages the scores for the recovery rate of insolvency proceedings involving domestic entities, as well as the strength of the legal framework applicable to judicial liquidation and reorganization proceedings. (Source: World Bank—Doing Business)

Bank-Level Variables

Past Syndicate Relationship: An indicator that equals one if two banks have been in the same lending syndicate in the past 5 years. (Source: DealScan)

Past Syndicated Loans: The number of loans that two banks have jointly issued (in the same lending syndicate) scaled by the number of loans arranged by the lead bank in the past 5 years. (Source: DealScan)

Past Borrower Size: The average size of borrowers that a bank lend to, serving as a lead arranger, in the past 5 years. (Source: DealScan)

%*Private Borrowers*: The percentage of borrowers that are private firms among all the borrowers that a bank lend to, serving as a lead arranger, in the past 5 years. (Source: DealScan)

%*Unrated Borrowers*: The percentage of borrowers without a credit rating among all the borrowers that a bank lend to, serving as a lead arranger, in the past 5 years. (Source: DealScan)

Market Leader: An indicator that equals one for lead bank j in year t if its market share in terms of origination volume over the previous 3 years in the home country is in the top quartile or its market share is above 5%, and zero otherwise. (Source: DealScan)

High Capital Openness: An indicator that equals one if a country's capital account openness index is in the top tercile of the sample, and zero otherwise. (Source: Jahan and Wang, 2017)

Low Accounting Quality: An indicator that equals one if a country's accounting transparency index falls below five. (Source: Barth, Caprio, and Levine, 2013)

Weak Governance: An indicator that equals one if one of the two Worldwide Governance Indicators index ("regulatory quality" or "rule of law") is in the top tercile of the sample, and zero otherwise. (Source: Kaufmann, Kraay, and Mastruzzi, 2011)

Tier 1 Capital: An indicator that equals one if a bank's ratio of Tier 1 capital to risk-weighted assets falls into the bottom tercile of the sample. (Source: Bankscope)

Recent Default: An indicator that equals one if a bank incurs a default in one of its packages. (Source: DealScan, Compustat, Capital IQ)

LRMES: Annual average of the LRMES with respect to the MSCI All-Country World Index, where a crisis is defined as a 40% decline in the market. (Source: NYU V-lab)

DVar: Annual average of the daily variance of the bank's stock price over a year. (Source: NYU V-lab)

Beta: Annual average of the daily Beta of the bank with respect to the MSCI All-Country World Index, using a Dynamic Conditional Beta model. (Source: NYU V-lab)

Corr: Average of the correlation of the firm with respect to the MSCI All-Country World Index, using an asymmetric dynamic conditional correlation model. (Source: NYU V-lab)

Borrower Characteristics (Source: Compustat and Global Compustat)

Size: Log of total assets (AT)

Profitability: Operating income (OIBDP)/total assets (AT)

Tangibility: Property, plant, and equipment (PPENT)/total assets (AT)

Rated: A dummy variable that equals one if the borrower has S&P credit rating, zero otherwise

M/B: Market to book ratio (Total assets (AT) − Book value of equity (CEQ) + Market value of equity (PRCC F × CSHO))/Book value of equity (CEQ)

Investment: Capital expenditure(CAPX)/total assets (AT)

Employment: Log of number of employees (EMP)

Sale: Log of sales (SALE)

Loan Characteristics (Source: DealScan)

Loan Spread: All-in-drawn loan spread over LIBOR

Have Covenant: An indicator that equals one if a loan package includes at least one restrictive covenant.

Loan Default: Indicator variable equal to one if the borrower receives default ratings from S&P during the course of the loan

Loan Maturity: Loan maturity in months

Loan Size: Log of the loan amount in US dollars

Loan Facilities: The number of facilities within a loan package

%Foreign Participants: The number of foreign participants as a proportion of the total number of participant banks in a syndicate

Appendix B: Other Risk-Inducing Regulations

We consider two other regulations that might induce banks to pursue cross-border risk-taking behavior. The first is regulatory restrictions on entry into the banking sector (*Entry*

Table B1. Effects of other risk-inducing regulations: entry requirement and funding insurance

This table examines two other aspects of banking regulation. Columns (1) and (2) examine the effects of *Entry Requirement*, representing a regulatory requirement for entering the banking industry. Columns (3) and (4) examine the effect of *Funding Insured*, the percent of deposits insured by the regulatory body. Bank regulatory indices are from the surveys conducted by Barth, Caprio, and Levine (2013). The definitions of all variables are provided in Appendix A. The regressions are conducted on a bank–pair–year panel, spanning the period from 1995 through 2016. Controls include the differences in GDP per capita, GDP growth, exchange rate returns, and interest rates between the participant and lead countries. We also control for between-country distance, common language, and bilateral trade. Standard errors are clustered by country–pair. Robust *t*-statistics are shown in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Regulation	*Entry Requirement*		*Funding Insured*	
	(1)	(2)	(3)	(4)
Dep. Var.	*Syndicate*	*%Syndicate*	*Syndicate*	*%Syndicate*
Δ*Regulation*	–0.005**	–0.162***	0.023	0.389*
	(–2.10)	(–4.76)	(1.49)	(1.75)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Lead, participant bank FE	Yes	Yes	Yes	Yes
Observations	676,483	676,483	169,694	169,694
Adjusted R^2	0.227	0.170	0.266	0.159

Requirement). Stricter requirements for new bank entry reduce the competition faced by incumbent banks, thus alleviating the pressure for banks to bear higher credit risk to achieve profits (Bushman, Hendricks, and Williams, 2016). Accordingly, we expect stricter entry requirements to be negatively correlated with banks' participation in global syndicates.

The next dimension is the deposit insurance coverage ratio (*Funding Insured*). Deposit insurance intensifies potential moral hazard problems, whereby depositors do not have strong incentives to monitor banks' activities (Demirgüç-Kunt and Kane, 2002). Therefore, banks in countries with high deposit insurance may conduct more risky lending activities than regulators find desirable (e.g., Demirgüç-Kunt and Detragiache, 2002; Laeven, 2002). As such, we expect that banks from countries with greater deposit insurance coverage are more likely to participate in global syndicates.

Appendix Table B1 reports the results that are consistent with our conjectures. A one standard deviation increase (1.11) in the difference between the entry requirement in the participant and lead countries is associated with a 0.7 (0.18) percentage point decrease in *Syndicate* (*%Syndicate*). Deposit insurance generates a larger effect: a one standard deviation increase in the difference in deposit insurance is associated with a 1 percentage point higher likelihood that a bank will participate in a global syndicate.

These results corroborate our baseline findings that global syndication is affected by risk-taking incentives induced by banking regulation. When regulations induce more risk-taking, banks participate more in foreign-led global syndicates.

References

Baker, M. and Wurgler, J. (2015): Do strict capital requirements raise the cost of capital? Bank regulation, capital structure, and the low-risk anomaly, *American Economic Review* 105, 315–320.

Bank for International Settlements (2010): Long-term issues in international banking, *Working Paper*.

Barth, J. R., Caprio, G., and Levine, R. (2004): Bank regulation and supervision: what works best?, *Journal of Financial Intermediation* 13, 205–248.

Barth, J. R., Caprio, G., and Levine, R. (2013): Bank regulation and supervision in 180 countries from 1999 to 2011, *Journal of Financial Economic Policy* 5, 111–219.

Basel Committee on Banking Supervision, and Bank for International Settlements (2000): *Principles for the Management of Credit Risk*.

Beatty, A. L., Ke, B., and Petroni, K. R. (2002): Earnings management to avoid earnings declines across publicly and privately held banks, *The Accounting Review* 77, 547–570.

Begley, T. A., Purnanandam, A., and Zheng, K. (2017): The strategic underreporting of bank risk, *Review of Financial Studies* 30, 3376–3415.

Bharath, S. T., Dahiya, S., Saunders, A., and Srinivasan, A. (2011): Lending relationships and loan contract terms, *Review of Financial Studies* 24, 1141–1203.

Bruno, V. and Shin, H. S. (2015): Capital flows and the risk-taking channel of monetary policy, *Journal of Monetary Economics* 71, 119–132.

Bushman, R. M., Hendricks, B. E., and Williams, C. D. (2016): Bank competition: measurement, decision making, and risk taking, *Journal of Accounting Research* 54, 777–826.

Cai, J. (2010): Competition or collaboration? The reciprocity effect in loan syndication. Working Paper, Washington University in St. Louis.

Cai, J., Eidam, F., Saunders, A., and Steffen, S. (2017): Diversification or specialization? An analysis of distance and collaboration in loan syndication networks. Working Paper, Washington University in St. Louis.

Campbell, J. Y. and Taksler, G. B. (2003): Equity volatility and corporate bond yields, *Journal of Finance* 58, 2321–2350.

Cerutti, E., Dell'Ariccia, G., and Martínez Pería, M. S. (2007): How banks go abroad: branches or subsidiaries?, *Journal of Banking & Finance* 31, 1669–1692.

Cerutti, E., Hale, G., and Minoiu, C. (2015): Financial crises and the composition of cross-border lending, *Journal of International Money and Finance* 52, 60–81.

Cetorelli, N. and Goldberg, L. S. (2012): Banking globalization and monetary transmission, *Journal of Finance* 67, 1811–1843.

Chava, S. and Roberts, M. R. (2008): How does financing impact investment? The role of debt covenants, *Journal of Finance* 63, 2085–2121.

Correa, R., Paligorova, T., Sapriza, H., and Zlate, A. (2018): Cross-border bank flows and monetary policy. Working Paper, Board of Governors of the Federal Reserve System.

Dell'Ariccia, G. and Marquez, R. (2010): Risk and the corporate structure of banks, *Journal of Finance* 65, 1075–1096.

Demirgüç-Kunt, A. and Detragiache, E. (2002): Does deposit insurance increase banking system stability? An empirical investigation, *Journal of Monetary Economics* 49, 1373–1406.

Demirgüç-Kunt, A. and Kane, E. J. (2002): Deposit insurance around the globe: where does it work?, *Journal of Economic Perspectives* 16, 175–195.

Djankov, S., Hart, O., McLiesh, C., and Shleifer, A. (2008): Debt enforcement around the world, *Journal of Political Economy* 116, 1105–1149.

Falato, A. and Liang, N. (2016): Do creditor rights increase employment risk? Evidence from loan covenants, *Journal of Finance* 71, 2545–2590.

Ferreira, M. A. and Matos, P. (2012): Universal banks and corporate control: evidence from the global syndicated loan market, *Review of Financial Studies* 25, 2703–2744.

Frame, W. S., Mihov, A., and Sanz, L. (2020): Foreign investment, regulatory arbitrage, and the risk of US banking organizations, *Journal of Financial and Quantitative Analysis* 55, 955–988.
Giannetti, M. and Yafeh, Y. (2012): Do cultural differences between contracting parties matter? Evidence from syndicated bank loans, *Management Science* 58, 365–383.
Houston, J. F., Lee, J., and Suntheim, F. (2018): Social networks in the global banking sector, *Journal of Accounting and Economics* 65, 237–269.
Houston, J. F., Lin, C., and Ma, Y. (2012): Regulatory arbitrage and international bank flows, *Journal of Finance* 67, 1845–1895.
Ivashina, V. and Scharfstein, D. (2010): Bank lending during the financial crisis of 2008, *Journal of Financial Economics* 97, 319–338.
Ivashina, V., Scharfstein, D. S., and Stein, J. C. (2015): Dollar funding and the lending behavior of global banks, *Quarterly Journal of Economics* 130, 1241–1281.
Jahan, M. S. and Wang, D. (2017): Capital account openness in low-income developing countries: Evidence from a new database, *International Monetary Fund*.
Karolyi, G. A., Sedunov, J., and Taboada, A. G. (2018): Cross-border bank flows and systemic risk. Working Paper, Cornell University.
Karolyi, G. A. and Taboada, A. G. (2015): Regulatory arbitrage and cross-border bank acquisitions, *Journal of Finance* 70, 2395–2450.
Kashyap, A. K., Stein, J. C., and Hanson, S. (2010): An analysis of the impact of substantially heightened capital requirements on large financial institutions. Working Paper, University of Chicago.
Kaufmann, D., Kraay, A., and Mastruzzi, M. (2011): The worldwide governance indicators: methodology and analytical issues, *Hague Journal on the Rule of Law* 3, 220–246.
Khwaja, A. I. and Mian, A. (2008): Tracing the impact of bank liquidity shocks: evidence from an emerging market, *American Economic Review* 98, 1413–1442.
Laeven, L. (2002): International evidence on the value of deposit insurance, *Quarterly Review of Economics and Finance* 42, 721–732.
Mian, A. (2006): Distance constraints: the limits of foreign lending in poor economies, *Journal of Finance* 61, 1465–1505.
Morais, B., Peydró, J. L., Roldán-Peña, J., and Ruiz-Ortega, C. (2019): The international bank lending channel of monetary policy rates and QE: credit supply, reach-for-yield, and real effects, *Journal of Finance* 74, 55–90.
Murfin, J. (2012): The supply-side determinants of loan contract strictness, *Journal of Finance* 67, 1565–1601.
Nini, G., Smith, D. C., and Sufi, A. (2009): Creditor control rights and firm investment policy, *Journal of Financial Economics* 92, 400–420.
Nirei, M., Sushko, V., and Caballero, J. (2016): Bank capital shock propagation via syndicated interconnectedness, *Computational Economics* 47, 67–96.
Ongena, S., Popov, A., and Udell, G. (2013): When the cats away the mice will play: does regulation at home affect bank risk–taking abroad?, *Journal of Financial Economics* 108, 727–750.
Plosser, M. and Santos, J. (2018): Banks' incentives and the quality of internal risk models, *Review of Financial Studies* 31, 2080–2112.
Ross, D. G. (2010): The "dominant bank effect:" How high lender reputation affects the information content and terms of bank loans, *Review of Financial Studies* 23, 2730–2756.
Schwert, M. (2020): Does borrowing from banks cost more than borrowing from the market?, *Journal of Finance* 75, 905–947.
Thakor, A. (1996): Capital requirements, monetary policy, and aggregate bank lending: theory and empirical evidence, *Journal of Finance* 51, 279–324.
Vallascas, F. and Hagendorff, J. (2013): The risk sensitivity of capital requirements: evidence from an international sample of large banks, *Review of Finance* 17, 1947–1988.