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Development banks and the syndicate structure: Evidence from a world sample*

Marta Degl'Innocenti^a, Marco Frigerio^b, Si Zhou^c

Abstract

Do development banks influence syndicate structure? Using a global dataset across 48 countries of 11,949 syndicated loans from 2001 to 2016, we show that lead banks decrease their loan shares and form less concentrated structures in mixed syndicates that include both development banks and private-sector banks as participant lenders. In line with the social view on the role of development banks, we find that such an effect is stronger during periods of financial instability, particularly for the green industry and in the case of borrowers that are financially constrained. Conversely, we do not find any evidence that mixed syndicates exhibit a different syndicate structure for political distortions. Lastly, we find that mixed syndicates are not associated with higher covenant violations and an increasing of the borrowers' risk profile after the loan origination. Our results are robust when accounting for, among others, relationship lending, asymmetric information within the syndicate, lenders' lending expertise, borrowers' opacity, types of loan, and ranking hierarchy in the syndicate.

JEL classification: D82; G21; G28

Keywords: Syndicated loan market; Syndicate structure; Development banks; Loan-level data

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1. Introduction

Over the last decades development banks have played an increasingly important role in syndicated lending which represents one of the primary sources of external financing for large corporations worldwide (e.g., OECD, 2018; Gurara et al., 2020). Yet despite the fact that co-lending by private-sector and development banks amounts to around 11% of all syndicated-loan funding worldwide corresponding to almost \$1 trillion in terms of total value¹, and with a peak of 20% in Europe and the Far East and Central Asia and the Middle East during the years 2001-2016 (see Table 1), not much is known about their impact on the syndicate structure.

As public sector or government-invested legal entities, development banks hold great appeal for the syndicate lending market for various reasons. They can arguably offer a “political umbrella” to the other participants by exerting a high bargaining power on governments’ decisions and preventing the occurrence of adverse policies that would negatively affect their investment outcome (Hainz and Kleimeier, 2012; Arezki et al., 2017; Gurara et al., 2020). They exhibit an anti-cyclical behavior which makes them more resilient to capital shortage during periods of financial turmoil/instability. Commercial banks may also be willing to participate in a syndicate as they can benefit from development banks’ risk management expertise in developing countries and their relationships with governments. Furthermore, development banks can extend their *de facto* preferred creditor status to financial institutions (De Luna-Martinez and Vicente, 2012; Lazzarini et al., 2015; Mazzucato and Penna, 2016; Broccolini et al., 2021). In addition, co-financing is of primary importance for development banks to attract *private capital flows* to support otherwise unfunded investments. Indeed, the use of syndicate loans may help development banks to meet their mission. For example, the European Bank for Reconstruction and Development (EBRD) clearly states in its founding Agreement that “to mobilize domestic and foreign capital” is one of its primary objectives.

¹ Data on syndicate loans to corporate borrowers (publicly listed and non-listed) are provided by data samples from Thomson Reuter’s Deal Scan database (see Table B1 in the Appendix for more details).

Specifically, the EBRD states that loan syndications represent a flexible and market-oriented tool to attain such a goal.^{2,3}

Most of the recent empirical literature exploring the effect of mixed syndicates including both development banks and private-sector lenders has focused on the role of multinational development banks on the access to credit for high-risk borrowers in emerging and developing countries (Gurara et al., 2020), and the mobilization of private resources to developing countries (Broccoloni et al., 2019). Hainz and Kleimeier (2012) show that development banks in the syndicate loans help mitigate political risk.

Although development banks might reduce risk concerns in the syndicate market, so far, to the best of our knowledge, no paper has explored whether and how the co-existence of development banks and private-sector lenders can affect the structure of syndicated loans that depend on the monitoring efforts exerted by lenders. In this paper, we address this issue by exploring whether the presence of development banks as participant lenders can reduce the loan share retained by the lead lender, who is responsible for due diligence and monitoring activities of borrowers, possibly altering the loan structure as a result.⁴

Next, we argue that development banks in the role of participant lenders could decrease the perceived riskiness of a loan. Consequently, other lenders may demand that the lead agent exerts less monitoring effort and thus retains a lower loan fraction. It follows that these syndicates should have a more diffuse loan ownership that can facilitate diversification of risk exposure across lenders (Esty and Megginson, 2003).

² See <https://www.ebrd.com/work-with-us/loan-syndications.html> for more details.

³ Development banks as arrangers can also mobilize banks and institutional investors as co-financiers through A/B loan structures. In this case, development banks provide the A portion of the loan, while commercial parties participate via the B-loan structure.

⁴ In the syndication process, the lead bank sets up and maintains the relationship with the borrower and is responsible for information collection and monitoring activities. Specifically, the lead agent assesses the borrowing firm's credit quality and then negotiates key terms with borrowers before approaching a group of potential lenders to join the syndicate (Lin et al., 2012). Once the preliminary loan agreement is signed, the lead arranger then deals with potential participant lenders to fund part of the loan. All the participants agree to fund part of the loan for which they are responsible and sign the loan agreement. Terms and conditions of the loan are identical for all syndicate members (Sufi, 2007).

Conversely, through their reputation, development banks could help the lead agent to secure sufficient funding from a handful of lenders. In addition, lead agents may themselves have more incentive to take on a larger fraction of the loan. From this viewpoint, the syndicate would be more concentrated. Given these contrasting views, this paper aims to provide nuanced evidence on whether and how participants' reputation may affect the syndicate structure, which indeed reflects lenders' monitoring effort.

To empirically conduct this study, we create a new worldwide dataset. Specifically, we gather data from three different sources. First, we map the development banks by referring to the worldwide list of development banks provided by Xu et al. (2019). We further refine the initial selection of development banks by manually checking the publicly available information and additional bank data providers.

Then, we use LPC-Dealscan which includes the most comprehensive and historical loan-deal information available on global loan markets. Third, we match the loans with firm-specific accounting information from Compustat and with macroeconomic (country-year) variables from freely available sources.

Our final data encompass 11,949 syndicated loans over the period 2001-2016 for 48 countries. Following the existing relevant studies, we account for the lead agent's loan share, the syndicate concentration and the syndicate size to analyze the syndicate structure (e.g., Sufi, 2007; Lin et al., 2012, Delis et al., 2020). Empirical evidence is consistent with the view that the lead agent retains a lower share in syndicates with development banks. Specifically, the results show that when development banks are participant lenders, the lead banks retain lower loan shares on average in a syndicate by approximately 2 percentage points (or about \$ 4 million in economic terms), which is a 7% decrease on an average lead bank's share of 29.19%. This result is economically relevant in the syndicate literature (Sufi, 2007; Ivashina, 2009; Delis et al., 2020). In addition, using the Herfindahl index, we show that syndicates with development banks are 11% less concentrated and have an average increase of approximately 36% in the number of lenders. These results suggest that

syndicates with development banks consist of a more diffuse loan ownership and, therefore, present a greater diversification of risk exposure across lenders.

We then explore whether social and/or political factors determine the impact of development banks on the syndicate structure. Specifically, consistent with the social view of government lending, development banks can possibly mitigate the volatility of private capital in-flows during financial crises because of their countercyclical behavior (Galindo and Panizza, 2018). They might also relax financial constraints for a set of preferred borrowers whose activities can generate positive effects on the economy or society (such as firms in green industries or with innovative projects) but that would otherwise remain underfunded. From this perspective, development banks should affect the syndicate structure particularly during periods of financial turmoil/financial instability, and for financially constrained borrowers.

In contrast, under the political view, development banks may divert resources for political objectives by financing friends and supporters of politicians (Sapienza, 2004; Dinc, 2005; Faccio et al., 2006). In this case, their participation in the syndicate could offer an implicit government guarantee to other lenders that politically connected borrowers will be bailed out if they encounter financial difficulties. Under this perspective, development banks' participation should play a role in the syndicate structure in the cases of state-owned or politically connected borrowers.

Our findings show that development banks reduce the lead agent share particularly in countries and years that experience higher financial instability and lower financial development, and such an effect is even stronger for firms in the green industries. In addition, in line with the social view on the role of development banks, we find that development banks can reduce the lead agent's loan allocation particularly in the case of firms that are financially constrained, in this way helping to reduce informational and contractual frictions within the syndicate. Conversely, we do not find any significant evidence for the impact of the political channel.

Our identification method controls for potential unobserved variables that might bias our inferences, i.e. country multiplied by year and industry multiplied by year fixed effects, to account

for time-variant country and industry characteristics. In the estimations we also incorporate lead bank and loan purpose effects, as well as firms', banks', and loans' characteristics. We also control for previous relationships of the lead bank with the borrowing firm and with the other participating lenders, and for development banks' nationality.⁵

We run a battery of robustness tests to verify our findings. First, we saturate the model with lead bank multiplied by year fixed effects. Second, we introduce country-quarter and industry-quarter fixed effects to control for country and industry characteristics possibly varying at the quarterly level. A further concern could be that development banks may prefer certain role functions in a syndicate. For example, by taking more senior role functions in the syndicate, their participation could be systematically associated with a lower lead agent's monitoring effort. We test this alternative explanation and find that the distribution of roles undertaken by development banks is like those of other participant lenders.

Another potential source of concern for our empirical analysis is that both development banks' participation in a syndicate and the syndicate structure could be associated with the borrowing firms' fundamental characteristics. To address this potential selection bias, we employ a matching technique to construct suitable control/treatment samples for the comparison of loan structures.

In addition, it could also be that development banks' participation is associated with a lower monitoring effort by the lead agent because development banks tend to participate more when the other lenders have expertise with respect to the borrowing firm's country and industry. We address this by re-estimating the baseline model by removing loans with a high presence of lenders with a high expertise in the borrowing firm's country and industry. Furthermore, we examine whether development banks participate more in syndicates when there are certain lenders. In this case the syndicate structure could be affected by both development banks and the other lenders associated

⁵ National and foreign development banks could indeed exert a different impact on the syndicate structure and composition because of their variety of expertise, reputation and exposure to local political pressure.

with them. Finally, we run a placebo test by randomly assigning the development banks' dummy to banks in our sample. Overall, our findings are robust to all these tests.

As additional analysis, we explore whether there is any evidence of risk deteriorating for borrowers receiving loans from mixed syndicates. In addition, we also consider whether development banks in the role of participants are associated with a higher probability of covenant violations. Both these analyses explore the possibility that shifts in the lead's ownership is associated with an increase of borrower's default risk. Our findings exclude all these occurrences.

Our paper contributes to the existing literature in several ways. First, we contribute to the stream of research that considers the effect of reputation on the syndicate structure. Specifically, Sufi (2007) empirically shows that both the lead bank and the borrower can mitigate asymmetric information concerns in the syndicate and thus reduce the loan share held by the lead bank. Consistently, other studies (e.g., Dennis and Mullineaux, 2000; Gopalan et al., 2011; Delis et al., 2020) examine the effect of lead lenders' market reputation on the syndicate structure. Conversely, we explore the "certification effect" of development banks as participant lenders on the syndicate structure.

Next, our study highlights new evidence on the role of development banks in the syndicate market. Very recent studies (Broccolini et al., 2021; Gurara et al., 2020) have examined the effect of multilateral development banks' participation on access to credit and mobilization of private resources to developing countries. In addition, Hainz and Kleimeier (2012) find that political risk affects the participation of development banks in syndicated lending. Differently from these works, our research is the first to study the effect of development banks' participation on the syndicate structure. Also, we do not restrict our analysis to specific geographical areas or types of loan.

Finally, we add new understanding to the strands of literature examining the government lending's goals according to the "social view" linked to the market failure hypothesis (Atkinson and Stiglitz, 1980) and "political lending view". Our empirical evidence shows that development banks are valued in their role of participants in the syndicates when they address market failure concerns

and when they help by maximizing social welfare rather than politicians' interests.

This paper is organized as follows. Our research hypothesis is developed in Section 2. Section 3 presents the sample and discusses the development banks' participation in a syndicate; Section 4 discusses the methodology; Section 5 presents the main results, and Section 6 shows robustness checks. Section 7 focuses on additional analyses which investigate the effect of development banks' participation on covenant breaches and other lenders' participation choices, and Section 8 concludes the paper.

2. Hypothesis development

2.1 Syndicate structure

Past research has widely acknowledged that the syndication process is affected by moral hazard issues between the lead bank and the other syndicate members, in addition to agency problems between the borrower and the lender (Diamond, 1984; Holmstrom and Tirole, 1997).

In the syndicate process, holding a large loan fraction represents a mechanism to spur the lead agent to exert the optimal level of monitoring (Diamond, 1984; Holmstrom and Tirole, 1997; Lin et al, 2012; Gustafson et al., 2021). This is because the lead agent's potential loss is indeed relative to the fraction of the loan it keeps (Sufi, 2007; Gustafson et al., 2021). Thus, the lead agent has the incentive to retain a lower loan fraction to reduce its risk exposure to the loan. For this reason, as highlighted by several studies (Pavel and Phillis, 1987; Pennacchi, 1988; Demsetz, 2000), the lead agent engages in loan selling to achieve a greater credit risk diversification.

In our context, and consistent with this body of literature, we first argue that the lead bank could use development banks' reputation and expertise to reduce asymmetric information and risks concerns within a syndicate. Unlike private and public commercial banks, development banks can in fact exercise a high bargaining power during governmental decisions by having a close relationship and constant engagement with governments. In this way, they can ameliorate political and country risks by offering legal protection and extending preferential treatment to other private-sector lenders

in case of borrowers' default (De Luna-Martinez and Vicente, 2012; Hainz and Kleimeier, 2012; Lazzarini et al., 2015; Mazzucato and Penna, 2016; Broccolini et al., 2021; Gurara et al., 2020). Therefore, we maintain that the lead agents could retain a lower fraction of the loan (Sufi, 2007; Ivashina, 2009), as they are under less pressure from other lenders to provide a credible signal regarding their monitoring commitment and borrower quality when there is a development bank on board. Under this view, development banks offer a certification signal on the investment quality.

However, the lead agent's loan retention in the syndicate market does not only reflect monitoring incentives but could be also associated to the so-called "pipeline risk" (Bruche et al., 2012). In line with Ivashina and Scharfstein (2010), during period of turmoil, banks cut their lending if they are more dependent on short-term debt rather than on more stable sources of funding (such as deposits) and are more vulnerable to credit-line drawdowns. We highlight that, given the decline in the supply of funding from other investors during periods of turmoil, the lead agent could have been forced to retain more shares to fully place the loan ("pipeline risk"). In this context, we therefore argue that development banks could have also helped the lead agent to mitigate the pipeline risk and the lack of demand problems by attracting other participants and reducing the lead agent's loan share.

While some could argue that the lead agent may have the incentive to retain a large loan fraction, particularly when less intense monitoring is required, and to secure funds from a few lenders, the available literature does not support this view. In general, a good reputation is valuable in the lending market to reduce the monitoring effort demanded by lenders (Lee and Mullineaux, 2004; Sufi, 2007; Ivashina, 2009; Delis et al., 2020). In addition, syndicates tend to be more concentrated particularly when there is a need to minimize the costs of managing a group lending process, to prevent free riding, and to resolve problems of financial distress (Brunner and Krahn, 2008). Having a concentrated loan becomes particularly important in the event the borrower becomes financially distressed. This is because the lending banks must typically reach a collective decision for any changes to loan rate, maturity, collateralization or amortization schedules in the restructuring process in case the borrower is in distress. A consensus on the restructuring process can be more

easily reached with a smaller number of participants. Therefore, lenders prefer syndicates that are small and more concentrated to minimize adverse selection problems and increase incentives to monitor when credit risk is high (Lee and Mullineaux, 2004). In line with this, as development banks can be instrumental in mitigating certain risks in the syndicates, we should not expect to observe more concentrated loans when they take part in a syndicate.

Drawing on these arguments, we therefore hypothesize that development banks in the role of participant lenders reduce the lead agent's share and contribute to a more dispersed ownership and diversification of risk exposure across lenders. We write this central prediction as follows:

Hypothesis 1. The lead agent should retain a lower fraction of the loan when a development bank participates in the syndicate.

2.2 The Social View

An increasing stream of research maintains that the large participation of development banks in lending markets is a response to market failures that lead to the undersupply of credit to firms when private financing is scarce (Atkinson and Stiglitz, 1980; Sapienza, 2004; Humphrey and Michaelowa, 2013). Indeed, development banks exhibit countercyclical behavior which can possibly help to mitigate the pro-cyclicality of private capital inflows (Galindo and Panizza, 2018). During periods of economic uncertainty and banking instability, banks are in fact likely to reduce their lending activities because of asset quality's deterioration, capital shortages, deleveraging, and funding constraints (De Haas and Van Horen 2012). Instead, due to their counter-cyclical role in times of crisis, development banks can counteract the volatility of private capital inflows and thus sustain growth and employment (Gutierrez et al., 2011; de Luna-Martinez and Vicente, 2012). Indeed, governments also respond to the economic shocks by providing their support to the economy through public development banks in order to play a countercyclical role and ease financing and liquidity constraints. For example, during the 2008 financial crisis, the European Investment Bank (EIB)

increased loan disbursement by 57% and increased credits to SMEs by 128% (Brei and Schclarek 2019). We therefore propose the following testable hypothesis:

Hypothesis 2. Development banks should increase other banks' participation in the syndicate loan in the case of unstable banking systems.

Hence, by offering both implicit state support for firm's debt, development banks can alleviate possible information asymmetry in the syndicate particularly in the case of financially constrained firms, such as small and nascent firms, or for firms whose activities can support strategic investments for economic development (e.g., high-tech industries) and/or offer high social spillover, as in the case of "green" and high-tech industries (Sapienza, 2004; Foray et al., 2012; Fotak and Lee, 2020). Consistently, Gurara et al. (2020) find that development banks have a higher propensity to finance projects which may not be financed by the private sector.

In general, the social view is based on the idea that the credits provided by government entities can enhance social welfare by smoothing informational and contractual frictions (Stiglitz and Weiss, 1981; Williamson, 1994). Under this social view on the role of development banks, we therefore expect that mixed syndicates reduce the lead agent's loan share during periods of financial turmoil/banking stability and for firms that are financially constrained or with high social spillovers. We therefore propose the following hypothesis:

Hypothesis 3. Development banks should affect the syndicate structure more for borrowers that are financially constrained or that have higher social spillovers.

2.3. The Political View

Conversely, other studies claim that development banks' participation in the lending markets may direct lending towards a preferred set of borrowers, which are politically connected firms. This type of borrower may receive preferential treatment in terms of interest rates and access to credit (Dinç,

2005; Lazzarini et al., 2015; Frigerio and Vandone, 2020). Consistent with Houston et al. (2014), political connections help insure firms against future changes in credit risk, the risk of default, and/or increase the likelihood of a bailout particularly during periods of financial turmoil. This can reduce the loan risk profile and induce lenders to charge lower rates. Having development banks as participant lenders in syndicates could make other lenders more willing to extend credit to politically connected borrowers. The reason is that development banks can offer implicit state support to other lenders on the firm's debt in the case that they experience financial distress. Thus, we hypothesize that development banks in the syndicate may help reduce the loan riskiness for politically connected borrowers, leading to a lower loan fraction retained by the lead agent.⁶ This hypothesis can be stated as follows:

Hypothesis 4. Development banks should affect the syndicate structure more for politically connected firms.

3. Data

3.1 Sample construction

To identify development banks, we started by referring to the worldwide list of development banks provided by Xu et al. (2019), which considers a development bank to be any institution that satisfies the following three criteria: (i) is legally independent and self-sustaining; (ii) pursues public policy objectives, and (iii) receives government support. The list encompasses 539 development banks that are part of either membership lists of development financial institutions,⁷ or other associations that could include development financial institutions among other members.⁸ We also refined and integrated the initial selection of development banks by manually checking of publicly available

⁶ We note that the social and political views of development banks are not mutually exclusive, as they might pursue multiple objectives at the same time. Therefore, more explanations could co-exist at the same time.

⁷ For the scope, Xu et al. (2019) consider the World Federation of Development Financing Institutions, including the Association of African Development Finance Institutions, the Association of Development Financing Institutions in Asia and the Pacific, the Association of National Development Finance Institutions in Member Countries of the Islamic Development Bank, and the Association of Development Finance Institutions in Latin America.

⁸ For example, the Long-Term Investors Club (LTIC) and the European Association of Public Banks (EAPB).

information (e.g., banks' websites and annual reports) and of additional information contained in the Orbis Bank Focus dataset, provided by Bureau van Dijk (BvD).

We exclude from our final sample Islamic banks, micro-financing institutions and universal banks (i.e. financial institutions that engage in both development financing and commercial activities). Differently from previous studies (Broccolini et al., 2021; Gurara et al., 2020), this paper also includes development banks at national and sub-national levels and not only multilateral organizations. This is an important feature of this paper as national and sub-national institutions represent 90% of all the existing development banks.

Following this procedure, we identify 554 development banks in 155 countries. Specifically, these development banks encompass 498 national or sub-national development banks (e.g., German KfW and the Korea Development Bank), and 56 multilateral (global or regional) development banks that are international financial institutions chartered by two or more countries (e.g., World Bank and the European Investment Bank). Data on syndicated loans come from the DealScan database between 2001 and 2016.⁹ We find that 57 development banks (of the 554 previously mapped) participated (directly or through one of their subsidiaries) at least once in a loan syndicate.¹⁰ Following Sufi (2007), the analysis is conducted at the deal level since the syndicated loan contract is drafted at that level, and all lenders are listed together on this contract.¹¹ Consistent with previous studies (e.g., Ivashina, 2009), for deals with multiple facilities, we select the loan characteristics of the largest tranche at the loan origination.

We include in our sample only the loans for which the borrowing firms' data can be matched to Global Compustat and for which the financial variables employed in the study are available.¹² Furthermore, we match the resulting dataset with macroeconomic (country-year) variables from several freely available sources such as the Global Financial Development database of the World

⁹ The sample starts from 2001 as development banks exhibit emerging renaissance since the beginning of the 2000s.

¹⁰ The list of development banks is reported in Table B3 of Appendix B.

¹¹ A syndicated loan deal may contain more than one loan tranche (or facility).

¹² We extract bank loan contract information from LPC-Dealscan and link loan-level data to Compustat firm data following Chava and Jarrow (2004), and then use the Dealscan-Compustat Link extended by Michael Roberts (Links are accessed through: <http://finance.wharton.upenn.edu/~mrrobert/styled-9/styled-12/index.html>).

Bank. Table B2 of the Appendix presents the definitions of each variable. Loan-related information is retrieved from DealScan. Our final data encompass 11,949 syndicated loans over the period 2001-2016 for 48 countries.

3.2 Development banks' participation in syndicates: main trends

Table 1 summarizes the development banks' participation in our sampled syndicated loans. It also reports the percentage weight of syndicated loans with development banks in terms of number of loans and loan amount by macro region by considering the borrower's country over the period 2001-2016. Specifically, the deals with at least one development bank as a lender amount to 10.9% of all the syndicated loans. As shown in Table 1, development banks' participation is particularly relevant in Far East and Central Asia and in Western Europe where it accounts for more than 20% of all the syndicate loans in terms of amount. On the other hand, development banks' participation is rather sporadic in the US where the incidence accounts for less than 5% of all the syndicates in terms of amount. Furthermore, development banks' participation in the syndicates appears equally distributed among various sectors such as agriculture, forestry and fishing, mining, construction and manufacturing, while its presence is rather low for services and retail trade. Development banks especially participate in loans aimed at supporting capital expenditure or project finance, and even debt repayment. Table B.1 in the Appendix reports the distribution of loans participated in by at least one development bank by macro-region.

[Insert Table 1 about here]

Finally, Table 2 presents the descriptive statistics and compares the main variables of interest in syndicates, respectively, without development banks' participation (*No DBs*) and with development banks' participation (*DB Participant*). We report the normalized differences which capture the discrepancies between the two groups, scaled by the square root of the sum of the variances. Imbens and Woolridge (2009) suggest that the normalized difference is to be preferred to the t-statistic as a

method to test the balancing of covariates since it is not systematically affected by sample size.¹³ Loan deals with development banks' participation have longer maturities and are larger in size. Development banks also appear to engage in deals with with larger borrowers that have more/greater tangibility. Furthermore, in terms of loan type, 73% of the syndicates with co-lending are term loans which have higher capital charges and tend to have more participants (Harjoto et al., 2006; Lin et al., 2012; Blickle et al, 2020; Croci et al., 2021).

[Insert Table 2 about here]

4. Methodology

To empirically test our hypothesis that development banks' participation in syndicate loans is associated with more dispersed ownership and diversification of risk exposure across lenders, we analyze the syndicated loan structure. Specifically, following previous studies (e.g., Sufi, 2007; Ivashina, 2009; Lin et al., 2012; Delis et al., 2020), we employ the following variables for the syndicate structure: i) the share of the loan held by the lead lender; ii) the Herfindahl-Hirschman index (HHI) of the syndicate; and iii) the logarithm number of lenders (in addition to the lead bank). To identify the main lead agent of a loan with multiple lenders, we follow the procedure suggested by Chakraborty et al. (2018). For each facility, the lead agent is identified by the lender with the highest rank following the ten-part ranking hierarchy developed by Chakraborty et al. (2018).¹⁴

Using a cross section of loans for multiple years, we employ the following model to examine development banks' impact on syndicate structure,

¹³ As a rule of thumb, linear regressions are not well balanced (i.e. they may be sensitive to the specification) when the normalized difference exceeds 0.25 (Imbens and Rubin, 2015).

¹⁴ The ranking hierarchy consists of the following roles: 1) lender is denoted as "Admin Agent", 2) lender is denoted as "Lead bank", 3) lender is denoted as "Lead arranger", 4) lender is denoted as "Mandated lead arranger", 5) lender is denoted as "Mandated arranger", 6) lender is denoted as either "Arranger" or "Agent" and has a "yes" for the lead arranger credit, 7) lender is denoted as either "Arranger" or "Agent" and has a "no" for the lead arranger credit, 8) lender has a "yes" for the lead arranger credit but has a role other than those previously listed ("Participant" and "Secondary investor" are also excluded), 9) lender has a "no" for the lead arranger credit but has a role other than those previously listed ("Participant" and "Secondary investor" are also excluded), and 10) lender is denoted as a "Participant" or "Secondary investor".

$$S_{i,j,k,t} = \beta_0 + \beta_1 \text{DB participant}_k + \beta_2 X_k + \beta_3 W_{i,t-1} + \beta_4 Z_{c,t} + \gamma_i + \delta_{c,t} + \theta_{d,t} + \varepsilon_{i,j,k,t} \quad (1)$$

where S represents the structure of the syndicate loan k initiated at time t and granted to borrower i with lender j as the lead lender, while c and d represent, respectively, the country and industry (division) of the borrower. The main variable of interest, *DB participant*, is equal to one if at least one development bank is among the participants (excluding the lead bank) in the loan syndicate, X is the vector of loan characteristics, and W is the vector of borrower characteristics at time $t-1$. Finally, γ_i , $\delta_{c,t}$ and $\theta_{d,t}$ denote lead bank effects, country-year effects, and industry-year effects, respectively.

Specifically, loan characteristics X include number of tranches, the term '*loan dummy*' (*Deal includes term loan*), *loan amount*, *loan maturity*, *covenants*, *collateral*, *institutional investors*, and *the loan purpose effects*. We also include the variable, *lead bank is a former lender*, to account for previous relationship lending over the last five years between the lead bank and the borrowing firm. Additionally, following Ivashina (2009), we consider syndicate-specific reputation variables – *Syndicate reputation: lead to participant* and *Syndicate reputation: reciprocal* – which refer to previous connections between syndicate members. Furthermore, we add the variable, *lead bank is foreign*, which is a dummy equal to one if the lead bank is foreign. In line with Bharath et al. (2011), we consider a period of five years to define all the relationship lending variables.¹⁵

Borrower fundamentals W include the *private firm dummy*, *logarithm of total asset*, *return on asset (ROA)*, *leverage* and *tangibility*. All variable definitions are reported in table B3 in the Appendix. Finally, country-year and industry-year fixed effects are intended to saturate our model from differences in time-variant country and industry characteristics. All standard errors are clustered by country-year and industry-year as well.

If the development banks play a role in ameliorating asymmetric information concerns and risks within syndicates, then we should expect the *DB participant* to exert a positive effect on the

¹⁵ In unreported tests, we also consider an alternative horizon of three years prior to the loan, and the results are consistent. Tables are available upon request.

syndicate structure. Instead, if the presence of a development bank in the syndicate curtails asymmetric information concerns, or has no effect, then the *DB participant* should be negatively related to or have no effect on the syndicate structure.

5. Empirical Analysis

5.1 Main findings

In this section we examine whether and, if so, to what extent the participation of a development bank in a syndicate affects the syndicate structure at the single loan level.

Table 3 presents the results when estimating equation (1). Overall, our results suggest that the effects of development banks' participation in the syndicates are not only statistically significant but also relevant from an economic perspective. In line with *Hypothesis 1*, Column 1 indicates that development banks' participation decreases the loan shares held by the lead bank by 2 percentage points, or around \$4 million in economic terms. Given that the lead banks have an average share of 29.19% (see Table 2), this finding implies a decrease of approximately 7% of the lead bank's loan share.¹⁶ This result is economically significant in the syndicate literature (e.g., Sufi, 2007; Ivashina, 2009; Delis et al., 2020).

Using the Herfindahl index, Column 2 also shows that syndicates with development banks are 11% less concentrated compared to other syndicates (0.03/0.27).¹⁷ Finally, Column 3 shows that development banks' participation increases the number of lenders in the syndicate by almost four lenders per loan which corresponds to an average of 36% compared to the average size of the entire sample. All the coefficient estimates are significantly different from zero.

¹⁶ It could be that our results are driven by term loans which represent around 70% of our sample. Term loans tend to have higher capital charges and, therefore, more participants. To account for this eventuality, we rerun our analysis excluding term loans. In an unreported table (available on request) we find results like those of our baseline model, in this way suggesting that the type of loan does not drive our main findings.

¹⁷ We also rerun the main analysis with *Syndicate size (number of lenders)* using a Poisson pseudo-maximum likelihood regression with multi-way fixed effects (Correia et al., 2020). As an alternative estimation model, we also employ a fractional regression model for the specifications with *Lead Share*, *Concentration (Herfindahl)* as dependent variables. The estimates confirm the baseline model results. The results are available upon request.

Overall, the results suggest that loans with development banks are less concentrated, with lower fractions retained by the lead banks. This suggests that the lead banks can form larger syndicates and is required to exert less due diligence and monitoring efforts when they are participant lenders. In line with our expectations, we also find that these syndicates have a more diffused structure.¹⁸

Concerning other control variables, Table 3 shows that particularly the lead bank's reputation – calculated following Ivashina (2009) as the maximum per cent number of deals arranged by the same lead bank with the same participants against the total number of deals organized by the lead bank over a five-year horizon – largely increases the number of lenders and reduces the lead bank loan share.

[Insert Table 3 about here]

It is possible that our previous findings are dominated by certain types of development bank. To verify this possibility, we rerun the analysis by excluding syndicated loans where development banks are domestic – i.e., they are headquartered in the same country as the borrowing firm.

Table 4 reports the estimation results. Our findings show that the effect of *foreign* (or *supranational*) development banks on both the share held by the lead agent and the syndicate concentration (Herfindahl index) is now larger and even more statistically significant (respectively at the 5% and 1% levels). Overall, our main findings appear to suggest that the effect on syndicate structure is stronger when we solely consider *foreign* (or *supranational*) development banks.

This result could be driven by the fact that foreign (or supranational) development banks tend to have wider international visibility and reputation which broadcasts a stronger signal for business opportunities in the lending market than is the case with domestic development banks. Because of

¹⁸ A lower lead agents' loan share does not imply lower loan spread. As pointed out by Ivashina (2009), the observed relation between loan spreads and lead bank shares is the result of a set of equilibrium points between the lead agent and other lenders.

their international networks, *foreign* (or *supranational*) development banks, which are also the largest entities (see for example EBRD, World Bank, IMF, African Development Bank), can indeed offer stronger support in terms of legal protection and extend preferential treatment in case of firm's default to other private-sector lenders. Indeed, the certification effect offered by their participation in a syndicate loan could be stronger compared to that offered by domestic national banks. Consequently, foreign (or supranational) development banks could have a stronger impact on the syndicate structure.

[Insert Table 4 about here]

5.2 The effect of social and political factors

Table 5 explores the social and political factors that can drive our results, based on the theoretical considerations presented in Section 2.2 and Section 2.3. For this investigation, we focus solely on the main variable of interest; that is, the lead agent's loan share. The control variables mirror those used in Table 3; however, we include interactions between *DB participant* and variables computed to measure both social and political factors that can determine the development banks' effect on the lead agents' share.

First, consistent with *Hypothesis 2*, we explore whether mixed syndicates reduce the lead agent's loan share during periods of banking instability and in low financially developed countries. Specifically, we make use of variables identifying Bank Z-score and market capitalization. Our focus is on the Bank Z-score's measure because it proxies the country's banking system soundness and vulnerability for each year. During periods of financial turmoil, banks shrink their lending and perform poorly. This could in turn affect their soundness (Ivashina and Scharfstein, 2010; Fahlenbrach et al., 2012) and diminish the Bank Z-score measure. Specifically, the Bank Z-score compares the buffer of a country's commercial banking system (capitalization and returns) with the volatility of its annual returns. We also use a measure of market capitalization to proxy for the country's financial status. As explained by Broccolini et al. (2021), development banks' ability to

attract private credit through syndicate loans can also be affected by the degree of financial development. As explained by Godlewski and Weill (2008), financial development is indeed important to explain the decision to syndicate a loan in emerging markets. Our expectation is that development banks' participation should specially matter to countries with a low financial depth as the firms' demand for funds could not be easily satisfied. Specifically, *Market Capitalization* is measured as the value of listed shares outside of the largest 10 largest companies to total value of all listed shares. It therefore accounts for the size of the equity market as an alternative source of finance for borrowers. All data are provided by the World Bank. Both these measures are entered in our estimations as inverse indicators (-), so that higher values correspond to higher probability of default of a country's commercial banking system (and therefore possible shock to capital supply for borrowers) and lower market capitalization.

In line with *Hypothesis 2*, Panel A of Table 5 shows that the interaction terms *Bank Z-score (-) × DB participant* and *Mkt Capitalization (-) × DB participant* are all negative and significant, suggesting that development banks as participant lenders can help reduce the lead agent's monitoring efforts during periods of banking instability and for low financially developed countries.

Similarly, to test *Hypothesis 3*, we identify firms that are *either* financially constrained *or* that can generate social spillovers. First, we build a measure of financial constraints (HP index) mirroring the approach proposed by Hadlock and Pierce (2010) as $HP\ index = -0.737 \times Size + 0.043 \times Size^2 - 0.040 \times Age$, in which *Size* is the log of total assets, and *Age* is the number of years from the year of a company's initial public stock offering (IPO date) reported in Compustat. *Age* is set equal to zero when the IPO date is not reported. We further identify financially constrained firms (*HP-constrained*) as firms whose *HP index* is above the median and construct a binary variable accordingly. Alternatively, we focus solely on small borrowers (*Small borrower*) that are classified as the firms in the first quartile in terms of total assets per year. Indeed, small firms are more likely to be financial constrained compared to their larger counterparts. Columns 3-4 in Panel A of Table 5 show that the coefficients on the interaction *DB participant ×*

Small Borrower and *DB participant* \times *HP-constrained* are negative and statistically significant, respectively, at the 5% and 1% levels, suggesting that loans by mixed syndicates to financially constrained and smaller borrowers reduce the lead agent's share by, respectively, 3.7 and 11 additional percentage points. This result suggests that development banks play a role in mitigating risk concerns, particularly for small and financially constrained firms.

Next, we identify firms that can potentially generate high social spillovers. Consistent with previous studies (Hasan and Tucci, 2010; Fotak and Lee, 2020), we consider firms in green and high-tech industries.¹⁹ According to the U.S. Bureau of Labor Statistics, *green* industries are classified as those that produce green goods and services²⁰, while *high-tech* sectors can be defined as industries that have high concentrations of workers in STEM (Science, Technology, Engineering, and Mathematics) occupations. For brevity, we discuss the construction of all other variables in Table B2 of the Appendix. Panel B of Table 5 shows that the coefficient on the interaction *DB participant* \times *Green Borrower* is negative and statistically significant at the 1% level, suggesting that loans by mixed syndicates to green borrowers reduce the lead agent's share by 12 percentage points. Instead, the interaction term between *DB participant* \times *High-Tech* is not significantly related to the lead agent's loan share.

Moreover, we explore whether development banks' participation might further reduce risk concerns for firms that can generate social spillovers in syndicates initiated during periods of financial instability. Specifically, we argue that development banks' participation in a syndicate may reduce the perceived risk for borrowers that can generate social spillovers, particularly during periods of banking instability. Indeed, when the banking system is more unstable, because of low profitability and/or low capital adequacy, banks may shrink their lending and become more selective about who they lend to. In this context, the role of development banks in a syndicate can be relevant

¹⁹ We also attempt to identify the sectors that might include infrastructure financing after having accounted for the loan purpose. However, the results are not significant. This could possibly be explained by the fact that infrastructure financing is still concentrated in a small number of recipient developing countries (Gurara et al., 2020), while we explore the effect of both national and multinational development banks worldwide.

²⁰ We use the definition provided by the U.S. Bureau of Labor Statistics to identify the industries that produce green goods and services (see <https://www.bls.gov/ggs/home.htm> for more details).

in reducing the perceived risks of firms that tend to be more financially constrained but which, at the same time, can generate important social spillovers (such as firms in the green industry or the high-tech industry) and spur the economic development (Sapienza, 2004; Foray et al., 2012; Fotak and Lee, 2020). Therefore, we consider the development banks' participation in a syndicate loan when the banking system is unstable, and the borrower belongs to a green industry. In this respect, Column 2 of Panel B shows that the triple interaction between *DB participant* \times *Bank Z-score* (-) \times *Green Borrower* is also negative and statistically significant, indicating that mixed syndicate loans to borrowers in the green industry are associated with an even lower lead agent's share in country-years with lower *Bank Z-score* (-73 bps). In contrast, we find no evidence that mixed syndicate loans to financially constrained in the high-tech industry can affect the syndicate structure.

Overall, our findings seem to support *Hypothesis 3*, particularly in the case of firms that are small, financially constrained, and active in the green industry.

Finally, we test whether development banks' participation tends to affect the syndicate structure particularly for politically connected borrowers. For the scope, we compute variables to identify borrowers that are either state-owned firms and/or politically connected firms. Subsequently, we define as *State-owned borrowers* every firms in which the government owns, directly or indirectly, an equity stake exceeding 50% accordingly to Fotak and Lee (2020). However, following Faccio (2006), we define as *Politically connected borrowers* all the firms in which their controlling shareholders and top managers are members of national parliaments or governments.

Panel A of Table 6 shows that none of the iterations – *Politically connected borrower* \times *DB participant*, *State-owned borrower* \times *DB participant* and *State-owned or Politically connected* \times *DB participant* – is significant. As an additional analysis, we have rerun the model by solely considering loans where both development banks and borrowers belong to the same country. The results of Table 6 Panel B, which exclude deals with foreign (or supranational) DBs, are similar to those of Table 6 Panel A. However, we found that the term *State-owned or Politically connected* * *domestic DB participant* reduces the lead agent's share by 5.45 percent points. While this is only weakly

significant (possibly for the low number of state-owned borrowers), the economic effect cannot be ignored. This result suggests that development banks' participation in a syndicate can reduce the lead agent share for state-owned firms in the case of deals with domestic banks.

These findings suggest that the impact of development banks' participation on the syndicate structure is not significantly different when the borrowers are politically connected or state-owned firms. Thus, we do not find support for *Hypothesis 4*. It seems that political factors do not play a significant role in reducing the lead agents' loan share for mixed syndicates.

[Insert Table 6 about here]

6. Robustness checks

This section presents a battery of additional exercises that we carried out to rule out alternative stories and to assess the robustness of our findings. First, we address the concerns associated with the potential endogeneity issues. Accordingly, we run additional tests to alleviate potential bias in our estimates due to omitted variables. Specifically, we control for lead bank multiplied by year fixed effects to capture supply-side explanations of the findings, including changes in the business model/capital availability of banks. Alternatively, we also consider the country multiplied by quarter and industry multiplied by quarter fixed effects to account for the omitted country and industry time-variant characteristics at the quarterly level that might bias our results. In addition, we account for selection bias issues and the preference of the development banks for certain lenders by applying a propensity score-matching procedure. Finally, we run a placebo test.

6.1 The role of development banks in the syndicates

It is possible that development banks participate in syndicates only if they can hold senior roles, such as co-leads and co-agents. Therefore, the effect of the *DB participant* dummy could be due to such a senior role rather than to development banks *per se*. In this case, the lead banks could retain a lower fraction of the loan because they delegate some monitoring activities to development banks. To

verify this possibility, we compare the distribution of roles undertaken by development banks and other participant lenders in syndicates. Figure 1 shows a similar pattern between development banks and other participant lenders, suggesting that development banks do not have a specific preference for syndicates' senior roles.

[Insert Figure 1 about here]

6.2 Additional fixed effects

First, we saturate the model with lead bank multiplied by year fixed effects. In this way we account for any time-variant lead bank-specific characteristics that might jointly affect development banks' participation in a syndicate and the syndicate structure. Then, we rerun our baseline regression by including country-quarter and industry-quarter fixed effect to control for possible time-variant country and industry characteristics at the quarterly level that could affect both a development bank's participation choice and the syndicate structure of a loan.

All the results reported in Table A1 of the Appendix corroborate the baseline finding of Table 3 as the coefficient of *DB participant* remains statistically significant with very similar magnitudes as those in the baseline regressions.

6.3 Sample selection issues

The association between development banks and the syndicate structure could be due to endogenous selection of firms based on their fundamental characteristics.

To address this potential selection bias, we match the loans participated in by development banks (treatment sample) with loans that have similar characteristics but without development banks' participants (control sample). Specifically, we first estimate the probability of having a development bank in a syndicate conditional on loan-level characteristics (maturity, amount, number of tranches and term loan dummy) and borrower-level fundamentals (total assets, ROA, leverage and tangibles) in the year prior to receiving the loan from a sample of loans. Then, using the closest propensity

scores from the probit estimation, for each loan in the treatment sample we select up to five loans within the same macro-region and industry (2-digit industrial code) without development banks' participation. Table 7 reports the estimates obtained rerunning our regressions within the matched sample. All the results corroborate and reinforce our previous findings as the effect of *DB participant* becomes statistically significant at the 1% level for all the dependent variables. We also report the matching statistics in Table A2 in the Appendix. Table A2 shows that the normalized difference between the treated and control samples is never higher than 0.25 with respect to the variables employed in the PSM procedure (see also footnote 14), thus confirming the good quality of the matching.

[Insert Table 7 about here]

6.4 Development banks and other lenders

In this subsection we explore whether our main results are driven by the fact that development banks participate in loans where the other lenders also have an expertise in the country/industry of the borrowing firm. To test this, for each other lender, we calculate two dummies (*'Top' country* and *'Top' industry*) that are equal to one if, respectively, industry and country of the borrowing firm are the industry (2-digit SIC) and country with the highest participation of lender i in the last five years before the syndication year t of the loan j , and zero otherwise. Then, we rerun our test in Table 5 by considering only the loans where the percentages of lenders with *'Top' country* expertise and *'Top' industry* expertise that equal to one are both below the mean of the entire sample. Results are consistent as reported in Table A3 of the Appendix.

Further, development banks might prefer to participate in syndicates when there are certain lenders. In this case, there could be a development bank-lender match. We verify whether this issue occurs in our sample by comparing each lender's participation rate for syndicates with development banks and without development banks. Specifically, we compute the lender's participation rate (lender PR) by considering the number of syndicates participated in by each lender over the total

number of syndicates. Two different rates are computed for each lender: one for syndicates with no DB on board (DB participant=0) and one for syndicates with at least one DB on board (DB participant=1). Figure A1 shows that lenders' participation rate is not driven by the presence of development banks. Lenders that invest more frequently in the syndicates with development banks have a higher participation rate even in syndicates without development banks.

6.5 Sample variations

To address the possible concern that our main findings are driven by potential sample variation, we rerun the baseline model by randomly assigning the *DB participant* dummy (sampling with replacement within each year) for 1,000 random resamples. Table A4 shows that the coefficient on the *DB participant* dummy estimated from these 1000 Monte Carlo simulations is not significantly different from zero for any of our dependent variables. This placebo test confirms that the effects observed from the participation of development banks in a syndicate are unusual compared to the effects from the participation of other banks.

7. Additional Analysis

7.1 Covenant violations

We further explore whether the participation of development banks is associated with a higher probability of covenant violations due to their selection of risky loans. There is a stream of research claiming that development banks are not better selectors of borrowers than is the case with private commercial banks. According to the political view discussed in Section 2, development banks may misallocate credit by either bailing out companies that would otherwise fail or channeling funds to firms for political advantages/purposes (Ades and Di Tella, 1997; La Porta et al., 2002; Faccio, 2006). Therefore, the recipients of credit would not be selected based on the quality of their entrepreneurial projects but for political reasons. To account for this issue, we explore whether

development banks' participation in a syndicate is associated with a higher likelihood of covenant violations. Specifically, following Demiroglu and James (2010), we consider the *Debt/EBITDA* ratio as financial covenant. Using yearly Compustat data, we define a violation as any year in which the covenant variable breaches the covenant threshold specified in the loan agreement during the three-year period following the origination of the loan. Table A5 shows that development banks' participation in a syndicate is not associated with a higher probability of covenant violations. The extended sample considers all the deals in Dealscan for which we could match the borrowers with Compustat's data²¹, while the matched sample is constructed following the procedure described in Section 6.3.

7.2 Borrowers' risk after loan origination

In this section we explore whether there is a higher increase of risk and decline in performance for borrowers in mixed syndicates after loan origination. Subsequently, we calculate the changes in borrowers' Altman Z-score and return on assets (ROA) after the loan origination for both loans with and without development banks. The variables of interests are computed over time horizons spanning one year to three years following loan initiation. The control sample is constructed by employing the propensity score-matching procedure described in Section 6.3. For borrowers receiving loans from mixed syndicates, we do not find any significant evidence, thereby suggesting declining profitability or increasing risks over the years following loan origination, as shown in Table 8. Thus, our findings rule out the possibility that loans with development banks as participant lenders have been allocated to under-performing borrowers.

[Insert Table 8 about here]

²¹ The extended sample also includes deals for which the lead agent's share is not available. The total number of deals is 44,899.

8. Conclusion

In this paper we explore whether development banks affect the syndicate structure. Specifically, we investigate whether syndicates with development banks are less concentrated and, therefore, have greater diversification of risk exposure across lenders. Using a novel dataset of syndicate loans across 48 countries from 2001 to 2016, we find strong evidence that syndicates with a development bank as a participant lender have a more diffuse loan ownership structure and consist of a double number of participant lenders. In these syndicates the lead bank retains a lower loan share by approximately 2 percentage points, which is a 7% decrease (or about \$4 million in economic terms) on an average lead bank's share of 29.19% in our sample. This result is consistent with the view that development banks' participation in the syndicate may offer a "certification effect" to the syndicate market concerning the investment's quality. The empirical results are very similar when we consider a battery of robustness tests.

Overall, our findings show that development banks reduce the lead agent share particularly in country and years with higher financial instability, consistent with the market failure hypothesis, and such an effect is even stronger for firms in the green industries. In addition, in line with the social view on the role of development banks, we find that development banks can reduce the lead agent's loan allocation particularly in the case of firms that are financially constrained, thereby helping to reduce informational and contractual frictions within the syndicate. Instead, political factors do not appear to motivate the impact of development banks on the syndicate structure.

Finally, we rule out the possibility that development banks' presence in syndicates is associated with riskier borrowers as we do not find any significant evidence that development banks' participation in the syndicates is associated with higher probability of covenant violations. In addition, we do not find any significant evidence suggesting declining profitability or increasing risks over the three years following loan origination for borrowers receiving loans from mixed syndicates compared to loans without development banks.

Overall, our results indicate that development banks play an important role in the syndicated loan market. A further extension to this research would be to develop a full taxonomy to classify development banks to better underpin which specific differentiations among them might be more effective in addressing market imperfections and mitigating lending inefficiencies. Finally, a future avenue of research might consider whether development banks create favorable conditions for firms to access the debt market or equity market.

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Table 1: Development banks in the syndicated loans

This table presents the percentage weight of development banks in the syndicated loans' market per macro-region by considering the borrower's country. The percentage weight is obtained both in terms of the number of loans (*# Loans*) and of the deal amounts (*Deal Amts*). For each loan participated in by at least one development bank, the deal amount refers to the whole deal and not only to the share participated in by the development bank. The reference period is 2001-2016.

| | Obs. | Percentage weight (per cent) of DBs in terms of: | |
|------------------------------------|--------|--|---------|
| | | # Loans | Amounts |
| <i>Macro-regions:</i> | | | |
| North America | 6,059 | 1.6 | 3.7 |
| South America | 60 | 55.0 | 66.0 |
| Western Europe | 1,086 | 13.7 | 20.7 |
| Eastern Europe | 41 | 31.7 | 11.5 |
| Africa | 30 | 13.3 | 9.1 |
| Far East and Central Asia | 4,250 | 11.4 | 24.9 |
| Oceania | 423 | 4.5 | 6.0 |
| <i>Industries (SIC divisions):</i> | | | |
| Agric., Forestry & Fishing | 56 | 16.1 | 16.9 |
| Mining | 922 | 9.2 | 17.2 |
| Construction | 422 | 6.9 | 17.0 |
| Manufacturing | 4,979 | 7.3 | 10.6 |
| Transp., Communic., Elect | 2,530 | 9.4 | 13.5 |
| Wholesale Trade | 659 | 4.9 | 9.7 |
| Retail Trade | 814 | 1.0 | 1.6 |
| Services | 1,567 | 2.2 | 4.2 |
| <i>Lead bank's nationality:</i> | | | |
| Same country as borrower | 9,488 | 4.4 | 7.0 |
| Different country (cross-lending) | 2,461 | 15.7 | 19.8 |
| <i>Loan purposes:</i> | | | |
| Corporate purposes | 5,052 | 3.5 | 8.2 |
| Working capital | 2,733 | 3.1 | 4.4 |
| Debt repayment | 1,541 | 13.4 | 22.8 |
| Acquisition line | 394 | 9.1 | 15.4 |
| Takeover | 446 | 2.7 | 8.5 |
| Capital expenditure | 418 | 23.2 | 36.9 |
| Project finance | 268 | 35.8 | 42.6 |
| Other | 1,097 | 8.4 | 7.3 |
| <i>Total</i> | 11,949 | 6.7 | 10.9 |

Table 2: Descriptive statistics for loans with and without development banks

This table presents the summary statistics of all the main variables in this study. The sample spans the 2001-2016 window. All variables obtained as ratios based on Compustat data are winsorized within the 1st and 99th percentiles. See Table B2 for variable definitions. Normalized difference refers to the difference in mean values between the subsample of loans with at least one development bank participating in the syndicate (*DB participant*) and the subsample of loans with no development banks participating (*No DBs*). Normalized difference is obtained according to the definition in Imbens and Woolridge (2009).

| Variable | Whole Sample | | | | | | No DBs | DB | Normalized difference |
|---|--------------|-------|----------|-------|--------|-------|--------|-------|-----------------------|
| | #Obs. | Mean | St. Dev. | p25 | Median | p75 | Part. | Part. | |
| | | | | | | | Mean | Mean | |
| <i>Syndicate Characteristics:</i> | | | | | | | | | |
| Syndicate size (number of lenders) | 11,949 | 9.84 | 8.48 | 4.00 | 7.00 | 13.00 | 9.50 | 15.37 | 0.37 |
| Lead share (per cent retained by the lead bank) | 11,949 | 29.19 | 24.21 | 10.58 | 21.67 | 42.86 | 29.76 | 19.78 | -0.32 |
| Concentration of syndicate (Herfindahl) | 11,949 | 0.27 | 0.24 | 0.10 | 0.19 | 0.36 | 0.27 | 0.22 | -0.18 |
| Deal amount (ln) | 11,949 | 19.18 | 1.52 | 18.13 | 19.16 | 20.21 | 19.14 | 19.85 | 0.34 |
| Deal maturity (months) | 11,949 | 46.97 | 31.49 | 24.00 | 48.00 | 60.00 | 45.48 | 71.42 | 0.44 |
| Collateral (dummy) | 11,949 | 0.28 | 0.45 | 0.00 | 0.00 | 1.00 | 0.28 | 0.27 | -0.03 |
| Covenant (dummy) | 11,949 | 0.31 | 0.46 | 0.00 | 0.00 | 1.00 | 0.32 | 0.06 | -0.51 |
| Institutional investors (dummy) | 11,949 | 0.27 | 0.44 | 0.00 | 0.00 | 1.00 | 0.27 | 0.24 | -0.05 |
| Reputation: lead to participant | 11,949 | 0.33 | 0.19 | 0.20 | 0.35 | 0.46 | 0.33 | 0.34 | 0.04 |
| Reputation: reciprocal (dummy) | 11,949 | 0.93 | 0.25 | 1.00 | 1.00 | 1.00 | 0.93 | 0.95 | 0.06 |
| Number of loan tranches | 11,949 | 1.37 | 0.84 | 1.00 | 1.00 | 1.00 | 1.35 | 1.79 | 0.28 |
| Deal includes term loan (dummy) | 11,949 | 0.40 | 0.49 | 0.00 | 0.00 | 1.00 | 0.38 | 0.73 | 0.52 |
| <i>Borrower Characteristics:</i> | | | | | | | | | |
| Private firm (dummy) | 11,949 | 0.29 | 0.46 | 0.00 | 0.00 | 1.00 | 0.29 | 0.32 | 0.04 |
| Total assets (ln) | 11,949 | 7.66 | 1.84 | 6.30 | 7.57 | 9.00 | 7.60 | 8.61 | 0.41 |
| ROA (per cent) | 11,949 | 2.89 | 7.93 | 0.98 | 3.16 | 6.20 | 2.89 | 2.96 | 0.01 |
| Leverage (per cent) | 11,949 | 30.99 | 19.01 | 17.65 | 29.85 | 41.87 | 30.68 | 36.11 | 0.22 |
| Tangibility (per cent) | 11,949 | 37.14 | 24.70 | 16.27 | 32.76 | 56.07 | 36.60 | 45.81 | 0.27 |

Table 3: Baseline results

This table reports the estimation results of the baseline model. Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Dependent variable: | Lead Share (per cent kept by lead bank) | Concentration (Herfindahl) | Syndicate size (number of lenders) |
|----------------------------------|--|----------------------------|---------------------------------------|
| | (1) | (2) | (3) |
| DB participant | -2.00* [1.11] | -0.03** [0.01] | 3.52*** [0.51] |
| The lead bank is a former lender | -1.04** [0.44] | -0.01*** [0.00] | 0.53*** [0.13] |
| The lead bank is foreign | -1.68** [0.71] | -0.01 [0.01] | 1.49*** [0.24] |
| Reputation: lead to participant | -19.57*** [2.74] | -0.28*** [0.02] | 6.07*** [0.59] |
| Reputation: reciprocal | -23.61*** [2.36] | -0.27*** [0.02] | 0.29 [0.33] |
| Private firm (dummy) | -0.32 [0.40] | -0.01*** [0.00] | -0.20 [0.16] |
| Total assets (ln) | -0.37** [0.17] | 0.00** [0.00] | 0.20** [0.08] |
| ROA | -0.08*** [0.03] | -0.00*** [0.00] | -0.00 [0.01] |
| Leverage | -0.03** [0.01] | -0.00** [0.00] | 0.00 [0.00] |
| Tangibility | -0.03*** [0.01] | -0.00*** [0.00] | 0.00 [0.00] |
| Deal amount (ln) | -3.51*** [0.42] | -0.04*** [0.00] | 2.57*** [0.21] |
| Deal maturity (months) | -3.49*** [0.46] | -0.02*** [0.00] | 0.38*** [0.13] |
| Collateral (dummy) | 4.77*** [0.54] | 0.04*** [0.01] | -0.88*** [0.21] |
| Covenant (dummy) | 1.53*** [0.48] | 0.01** [0.00] | -0.70*** [0.17] |
| Institutional investors (dummy) | -6.81*** [0.68] | -0.06*** [0.01] | 3.69*** [0.24] |
| Number of loan tranches | 0.51* [0.29] | 0.02*** [0.00] | 0.73*** [0.18] |
| Deal includes term loan (dummy) | -1.21* [0.69] | 0.00 [0.01] | 0.69*** [0.24] |
| Loan purpose dummies | YES | YES | YES |
| Lead bank effects | YES | YES | YES |
| Country-year effects | YES | YES | YES |
| Industry-year effects | YES | YES | YES |
| Observations | 11,949 | 11,949 | 11,949 |
| r2 | 0.48 | 0.52 | 0.56 |

Table 4: Foreign (or supranational) DBs

This table reports the estimation results of the baseline model after excluding domestic DBs. Foreign (or supranational) DBs are development banks which belong to a different country with respect to the borrower's country. Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Dependent variable: | Lead Share (per cent retained by lead bank) | Concentration (Herfindahl) | Syndicate size (number of lenders) |
|---|---|-------------------------------|---------------------------------------|
| | (1) | (2) | (3) |
| Foreign (or supranational) DB Participant | -2.86** [1.14] | -0.04*** [0.01] | 4.63*** [0.79] |
| The lead bank is a former lender | -1.03** [0.43] | -0.01*** [0.00] | 0.48*** [0.14] |
| The lead bank is foreign | -1.64** [0.75] | -0.01 [0.01] | 1.25*** [0.21] |
| Reputation: lead to participant | -18.97*** [2.62] | -0.27*** [0.02] | 6.02*** [0.57] |
| Reputation: reciprocal | -24.51*** [2.34] | -0.28*** [0.02] | 0.33 [0.34] |
| Borrower characteristics | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES |
| Lead bank effects | YES | YES | YES |
| Country-year effects | YES | YES | YES |
| Industry-year effects | YES | YES | YES |
| Observations | 11,624 | 11,624 | 11,624 |
| r2 | 0.49 | 0.53 | 0.56 |

Table 5. Social View

Panel A: Financial instability/development and financially constrained borrowers

Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Dependent variable: Lead Share (per cent kept by lead bank) | | | | |
|--|--------------------|---------------------|-------------------|---------------------|
| | (1) | (2) | (3) | (4) |
| DB participant | -7.29*** [2.19] | -23.11*** [3.82] | -0.77 [1.35] | -1.70* [0.98] |
| Bank Z-score (-) | 0.07 [0.07] | | | |
| Bank Z-score (-) * DB participant | -0.27*** [0.10] | | | |
| Mkt Capitalization (-) | | 0.19*** [0.06] | | |
| Mkt Capitalization (-) * DB participant | | -0.32*** [0.06] | | |
| HP Index | | | 1.71*** [0.39] | |
| HP Index * DB participant | | | -3.66** [1.48] | |
| Small borrower | | | | 4.92*** [0.52] |
| Small borrower * DB participant | | | | -11.02*** [2.76] |
| Borrower characteristics | YES | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES | YES |
| Country-year characteristics | YES | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES | YES |
| Lead bank effects | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES |
| Country effects | YES | YES | YES | YES |
| Industry effects | YES | YES | YES | YES |
| Observations | 11,933 | 11,407 | 11,945 | 11,949 |
| r2 | 0.45 | 0.45 | 0.45 | 0.45 |

Panel B: Green and high-tech industries

Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Dependent variable: Lead Share (per cent kept by lead bank) | | | | |
|---|----------|----------|----------|----------|
| | (1) | (2) | (3) | (4) |
| DB participant | -7.33*** | -5.63** | -7.16*** | -6.32*** |
| | [2.18] | [2.21] | [2.10] | [2.39] |
| Bank Z-score (-) | 0.08 | 0.07 | 0.07 | 0.02 |
| | [0.07] | [0.07] | [0.07] | [0.08] |
| DB participant * Bank Z-score (-) | -0.27*** | -0.17* | -0.27*** | -0.23* |
| | [0.10] | [0.10] | [0.10] | [0.12] |
| Green Borrower | 1.31*** | 2.45* | | |
| | [0.41] | [1.40] | | |
| DB participant * Green Borrower | 0.40 | -12.31** | | |
| | [1.83] | [6.07] | | |
| Bank Z-score (-) * Green Borrower | | 0.06 | | |
| | | [0.06] | | |
| DB participant * Bank Z-score (-) * Green Borrower | | -0.73** | | |
| | | [0.29] | | |
| High-Tech | | | 0.72** | 4.27*** |
| | | | [0.34] | [1.15] |
| DB participant * High-Tech | | | -0.76 | -4.00 |
| | | | [1.79] | [4.24] |
| Bank Z-score (-) * High-Tech | | | | 0.17*** |
| | | | | [0.05] |
| DB participant * Bank Z-score (-) * High-Tech | | | | -0.15 |
| | | | | [0.16] |
| Borrower characteristics | YES | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES | YES |
| Country-year characteristics | YES | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES | YES |
| Lead bank effects | YES | YES | YES | YES |
| Year effects | YES | YES | YES | YES |
| Country effects | YES | YES | YES | YES |
| Industry effects | YES | YES | YES | YES |
| Observations | 11,933 | 11,933 | 11,933 | 11,933 |
| r2 | 0.45 | 0.45 | 0.45 | 0.45 |

Standard errors in brackets

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6. Political connections

Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Whole Sample

| Dependent variable: Lead Share (per cent kept by lead bank) | | | |
|--|--------|--------|--------|
| | (1) | (2) | (3) |
| DB participant | -1.96* | -2.09* | -2.11* |
| | [1.18] | [1.09] | [1.16] |
| State-owned borrower | 3.39** | | |
| | [1.54] | | |
| State-owned borrower * DB participant | -0.62 | | |
| | [3.06] | | |
| Politically connected borrower | | -3.21 | |
| | | [2.69] | |
| Politically connected borrower * DB participant | | 3.48 | |
| | | [3.87] | |
| State-owned or Politically connected | | | 0.37 |
| | | | [1.67] |
| State-owned or Politically connected * DB participant | | | 1.44 |
| | | | [2.21] |
| Borrower characteristics | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES |
| Lead bank effects | YES | YES | YES |
| Country-year effects | YES | YES | YES |
| Industry-year effects | YES | YES | YES |
| Observations | 11,949 | 11,949 | 11,949 |
| r2 | 0.48 | 0.48 | 0.48 |

Panel B: Excluding deals with foreign (or supranational) DBs

| Dependent variable: Lead Share (per cent kept by lead bank) | | | |
|--|--------|--------|--------|
| | (1) | (2) | (3) |
| DB participant | -0.99 | -0.87 | -1.16 |
| | [2.11] | [1.99] | [2.02] |
| State-owned borrower | 3.42** | | |
| | [1.59] | | |
| State-owned borrower * domestic DB participant | 7.51 | | |
| | [6.55] | | |
| Politically connected borrower | | -3.32 | |
| | | [2.76] | |
| Politically connected borrower * domestic DB participant | | 3.02 | |
| | | [5.11] | |
| State-owned or Politically connected | | | 0.30 |
| | | | [1.70] |
| State-owned or Politically connected * domestic DB participant | | | 5.45* |
| | | | [3.26] |
| Borrower characteristics | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES |
| Lead bank effects | YES | YES | YES |
| Country-year effects | YES | YES | YES |
| Industry-year effects | YES | YES | YES |
| Observations | 11,540 | 11,540 | 11,540 |
| r2 | 0.48 | 0.48 | 0.48 |

Table 7: Baseline results with matching procedure

This table reports the estimation results of the baseline model with matching procedure. Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

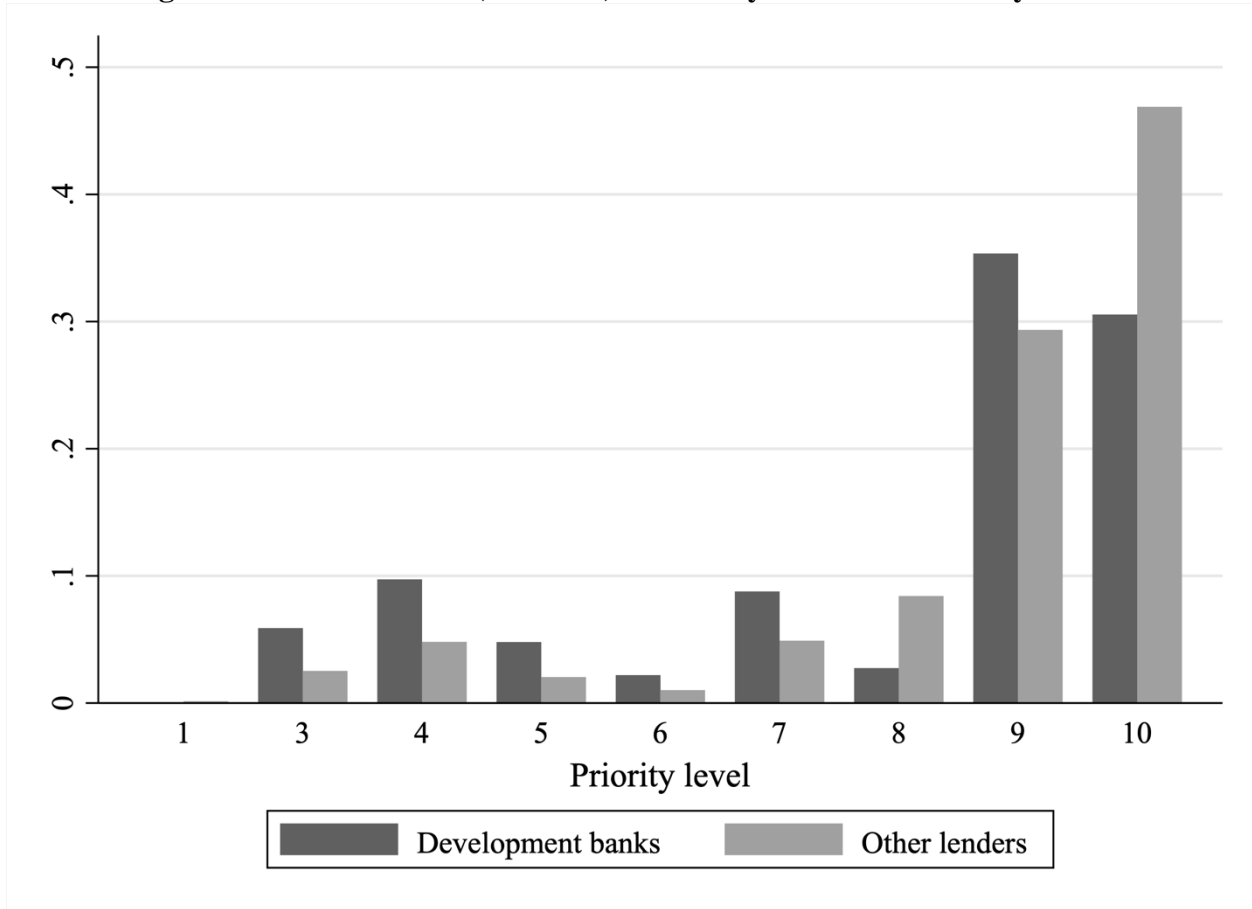
| Dependent variable: | Lead Share (per cent kept by lead bank) | Concentration (Herfindahl) | Syndicate size (number of lenders) |
|----------------------------------|--|-------------------------------|---------------------------------------|
| | (1) | (2) | (3) |
| DB participant | -3.61*** [1.32] | -0.04*** [0.01] | 3.44*** [0.53] |
| The lead bank is a former lender | 0.34 [1.02] | 0.00 [0.01] | 0.73** [0.36] |
| The lead bank is foreign | -1.24 [1.53] | -0.00 [0.01] | 2.48*** [0.58] |
| Reputation: lead to participant | -15.68*** [4.47] | -0.27*** [0.04] | 6.55*** [1.14] |
| Reputation: reciprocal | -14.53*** [3.60] | -0.17*** [0.02] | 1.09** [0.51] |
| Borrower characteristics | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES |
| Lead bank effects | YES | YES | YES |
| Country-year effects | YES | YES | YES |
| Industry-year effects | YES | YES | YES |
| Observations | 2,488 | 2,488 | 2,488 |
| r2 | 0.48 | 0.52 | 0.65 |

Table 8: Borrowers' characteristics over three years from loan inception

This table presents mean changes (differences) in Altman Z-score and ROA (as defined in Table B3) for borrowers receiving syndicated loans with a development bank and for benchmark borrowers receiving syndicated loans in our propensity score-matched sample (as defined in Section 6.3). Variables are measured at the end of each year. The differences reported for borrowers in the two samples (columns 1 and 2) are obtained comparing the values of the first, second and third years following the loan initiation (t+1, t+2, and t+3) with the value of the year preceding loan initiation (t-1). *p* -values are reported below the mean differences. Finally, difference-in-difference values (column 3) are computed as the difference between the changes for borrowers of the development bank sample (column 1) and the changes for borrowers of the matched sample (column 2). The statistical significance of this difference-in-difference is tested with t -test (column 4). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Variable (change) | Year | | DB participation | Matched sample | Difference = (1) – (2) | t-test | #Obs. |
|----------------------|------|-----------------|---------------------|-------------------|---------------------------|--------|-------|
| | | | (1) | (2) | (3) | (4) | |
| Altman Z-score | 1 | mean | 0.208 | -0.180 | 0.388 | 1.598 | 1,445 |
| | | <i>p</i> -value | 0.586 | 0.003 | | | |
| | 2 | mean | 0.127 | -0.039 | 0.167 | 0.510 | 1,334 |
| | | <i>p</i> -value | 0.757 | 0.762 | | | |
| | 3 | mean | 0.104 | -0.079 | 0.183 | 0.470 | 1,207 |
| | | <i>p</i> -value | 0.822 | 0.627 | | | |
| ROA | 1 | mean | -0.940 | -0.997 | 0.058 | 0.093 | 2,015 |
| | | <i>p</i> -value | 0.003 | 0.004 | | | |
| | 2 | mean | -2.299 | -1.565 | -0.734 | -0.754 | 1,879 |
| | | <i>p</i> -value | 0.013 | 0.001 | | | |
| | 3 | mean | -2.115 | -1.986 | -0.129 | -0.129 | 1,714 |
| | | <i>p</i> -value | 0.004 | 0.000 | | | |

Figure 1: Distribution of (non-lead) lenders by rank level in the syndicate



Appendix A. Robustness Checks

Figure A1: Participation rate by lender (Lender PR)

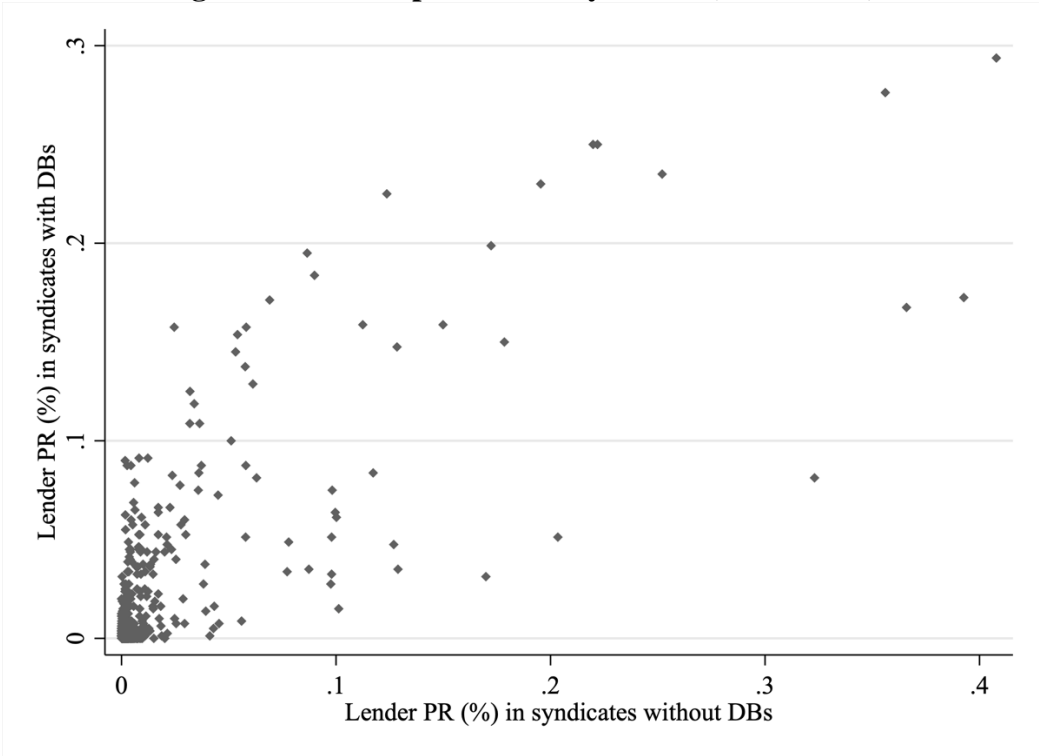


Table A1: Controlling for additional fixed effects

This table reports the estimation results of the baseline model after adding additional fixed effects. Variable definitions are provided in Table B2. Standard errors (reported in brackets) are clustered by country-year and industry-year in columns (1), (3), (5), and by country-quarter and industry-quarter in columns (2), (4), (6). ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Dependent variable: | Lead Share (per cent kept by lead bank) | | Concentration (Herfindahl) | | Syndicate size (number of lenders) | |
|----------------------------------|--|-----------|-------------------------------|----------|---------------------------------------|---------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| DB participant | -2.39* | -1.74* | -0.03*** | -0.02** | 3.34*** | 3.55*** |
| | [1.28] | [1.04] | [0.01] | [0.01] | [0.60] | [0.58] |
| The lead bank is a former lender | -0.85* | -0.87** | -0.01*** | -0.01*** | 0.52*** | 0.55*** |
| | [0.47] | [0.43] | [0.00] | [0.00] | [0.14] | [0.12] |
| The lead bank is foreign | -1.67* | -1.52* | -0.01 | -0.01 | 1.74*** | 1.46*** |
| | [0.98] | [0.88] | [0.01] | [0.01] | [0.29] | [0.23] |
| Reputation: lead to participant | -20.89*** | -19.41*** | -0.32*** | -0.28*** | 6.71*** | 5.83*** |
| | [3.56] | [2.14] | [0.03] | [0.02] | [0.79] | [0.48] |
| Reputation: reciprocal | -23.15*** | -23.85*** | -0.26*** | -0.27*** | 0.31 | 0.37 |
| | [2.54] | [1.59] | [0.03] | [0.01] | [0.36] | [0.27] |
| Borrower characteristics | YES | YES | YES | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES | YES | YES | YES |
| Lead bank-year effects | YES | NO | YES | NO | YES | NO |
| Country-year effects | YES | NO | YES | NO | YES | NO |
| Industry-year effects | YES | NO | YES | NO | YES | NO |
| Lead bank effects | NO | YES | NO | YES | NO | YES |
| Country-quarter effects | NO | YES | NO | YES | NO | YES |
| Industry-quarter effects | NO | YES | NO | YES | NO | YES |
| Observations | 11,316 | 11,476 | 11,316 | 11,476 | 11,316 | 11,476 |
| r2 | 0.53 | 0.52 | 0.58 | 0.57 | 0.60 | 0.59 |

Table A2: Descriptive statistics after PSM

This table presents the difference in mean values between the subsample of loans with at least one development bank participating in the syndicate (*DB participant*) and the subsample of loans with no development banks participating (*No DBs*), obtained within the propensity score-matched sample (as defined in Section 6.3). The sample spans the 2001-2016 window. All variables obtained as ratios based on Compustat data are winsorized within the 1st and 99th percentiles. See Table B2 for variable definitions. Normalized difference is obtained according to the definition in Imbens and Wooldridge (2009).

| Variable | Whole Sample #Obs. | No DBs Part. Mean | DB Part. Mean | Normalized difference |
|---|--------------------------|-------------------------|---------------------|--------------------------|
| <i>Syndicate Characteristics:</i> | | | | |
| Syndicate size (number of lenders) | 2,488 | 10.16 | 15.72 | 0.34 |
| Lead Share (per cent kept by the lead bank) | 2,488 | 27.32 | 19.94 | -0.23 |
| Concentration of syndicate (Herfindahl) | 2,488 | 0.28 | 0.21 | -0.22 |
| Deal amount (ln) | 2,488 | 19.34 | 19.87 | 0.25 |
| Deal maturity (months) | 2,488 | 61.14 | 70.98 | 0.16 |
| Collateral (dummy) | 2,488 | 0.23 | 0.25 | 0.04 |
| Covenant (dummy) | 2,488 | 0.13 | 0.06 | -0.17 |
| Institutional investors (dummy) | 2,488 | 0.23 | 0.24 | 0.02 |
| Reputation: lead to participant | 2,488 | 0.32 | 0.34 | 0.05 |
| Reputation: reciprocal (dummy) | 2,488 | 0.92 | 0.95 | 0.09 |
| Number of loan tranches | 2,488 | 1.47 | 1.75 | 0.18 |
| Deal includes term loan (dummy) | 2,488 | 0.70 | 0.72 | 0.03 |
| <i>Borrower Characteristics:</i> | | | | |
| Private firm (dummy) | 2,488 | 0.30 | 0.31 | 0.01 |
| Total assets (ln) | 2,488 | 8.33 | 8.62 | 0.12 |
| ROA (per cent) | 2,488 | 2.80 | 3.05 | 0.03 |
| Leverage (per cent) | 2,488 | 35.48 | 36.02 | 0.02 |
| Tangibility (per cent) | 2,488 | 43.13 | 45.79 | 0.08 |

Table A3: Only packages with a ‘low’ percentage of top country and top industry lenders

This table reports the estimation results of the baseline model. Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Dependent variable: | Lead Share (per cent kept by lead bank) | Concentration (Herfindahl) | Syndicate size (number of lenders) |
|----------------------------------|--|-------------------------------|---------------------------------------|
| | (1) | (2) | (3) |
| DB participant | -1.84* [1.07] | -0.03*** [0.01] | 3.73*** [0.61] |
| The lead bank is a former lender | -1.03** [0.51] | -0.02*** [0.00] | 0.51*** [0.14] |
| The lead bank is foreign | -2.05*** [0.69] | -0.01 [0.01] | 1.44*** [0.24] |
| Reputation: lead to participant | -19.88*** [2.64] | -0.27*** [0.02] | 6.20*** [0.59] |
| Reputation: reciprocal | -27.71*** [2.59] | -0.32*** [0.03] | 0.38 [0.36] |
| Borrower characteristics | YES | YES | YES |
| Syndicate characteristics | YES | YES | YES |
| Loan purpose dummies | YES | YES | YES |
| Lead bank effects | YES | YES | YES |
| Country-year effects | YES | YES | YES |
| Industry-year effects | YES | YES | YES |
| Observations | 8,967 | 8,967 | 8,967 |
| r2 | 0.52 | 0.55 | 0.57 |

Table A4: Placebo test

This table reports the coefficient of the “DB participant” dummy (randomly assigned) for 1,000 random resamples. Estimations are obtained from the same baseline specification of Table B2.

| | Dependent Variable: | | |
|----------|--|---------------------------------------|---|
| | Lead Share (per cent kept by lead bank) | Concentration (Herfindahl) | Syndicate size (number of lenders) |
| Mean | -0.0503 | -0.000 | 0.004 |
| S.E. | [0. 702] | [0. 006] | [0.227] |
| Controls | [see Tab. 3] | [see Tab. 3] | [see Tab. 3] |

Table A5: Covenant violations

This table estimates the relationship between financial covenant violations and development bank's participation in syndicated loans (DB participant) during the three years following the loan inception. For the scope we consider as financial covenants the Debt/EBITDA ratio, excluding the cases in which EBITDA is negative. Variable definitions are provided in Table B2. Standard errors clustered by country-year and industry-year are reported in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| Dependent variable: Debt/ EBITDA covenant violation | Extended Sample | Matched Sample |
|--|--------------------|-----------------|
| | (1) | (2) |
| DB participant | 0.08 [0.06] | -0.03 [0.32] |
| Lead bank is a former lender | -0.02 [0.01] | 0.05 [0.19] |
| The lead bank is foreign | 0.02 [0.02] | 0.08 [0.25] |
| Reputation: lead to participant | -0.16*** [0.05] | -1.02 [1.01] |
| Reputation: reciprocal | 0.02 [0.02] | -0.32 [0.38] |
| Borrower characteristics | YES | YES |
| Syndicate characteristics | YES | YES |
| Loan purpose dummies | YES | YES |
| Lead bank effects | YES | YES |
| Country-year effects | YES | YES |
| Industry-year effects | YES | YES |
| Observations | 5,679 | 95 |
| r2 | 0.13 | 0.63 |

Appendix B

**Table B1: Loans participated in by at least one development bank:
distribution by macro-region**

This table presents the percentage weight of single macro-regions in the sample of syndicated loans participated in by at least one development bank. Macro-regions are identified according to the borrower's country. The percentage weight is obtained both in terms of the number of loans (*# Loans*) and of the deal amounts (*Deal Amt*s). For each loan participated in by at least one development bank, the deal amount refers to the whole deal and not only to the share participated in by the development bank. The reference period is 2001-2016.

| Frequencies and amounts by region: | | | | |
|------------------------------------|---------------------|----------|----------------------------|----------|
| Macro-region | # Loans (number) | Per cent | Amounts (billions US\$) | Per cent |
| North America | 99 | 12.4 | 176.0 | 20.3 |
| South America | 33 | 4.1 | 55.3 | 6.4 |
| Western Europe | 149 | 18.6 | 354.9 | 41.0 |
| Eastern Europe | 13 | 1.6 | 4.2 | 0.5 |
| Africa | 4 | 0.5 | 1.4 | 0.2 |
| Far East and Central Asia | 483 | 60.4 | 260.9 | 30.1 |
| Oceania | 19 | 2.4 | 13.7 | 1.6 |
| Total | 800 | 100.0 | 866.4 | 100.0 |

Table B2: Variables' Definitions

| Variable | Source | Description |
|---|-----------|--|
| <i>General</i> | | |
| Lead bank | Dealscan | The lead bank is identified by the highest ranked agent for each loan following the ranking hierarchy suggested by Chakraborty et al. (2018). |
| DB participant (Participation of a DB) | Dealscan | Dummy equal to one if at least one development bank is among the participants (excluding the lead bank) in the loan syndicate. |
| Participation of a domestic DB | Dealscan | Dummy equal to one if the participants (excluding the lead bank) in the loan syndicate include at least one national (or sub-national) development bank that is in the same country as the borrowing firm. |
| <i>Syndicate structure</i> | | |
| Syndicate size (number of lenders) | Dealscan | Number of lenders participating in the lending syndicate. |
| Concentration of syndicate (Herfindahl) | Dealscan | Following Sufi (2007), the Herfindahl measures the concentration of holdings within a syndicate by using each syndicate member's share in the loan; it is the sum of the squared individual shares in the loan (ranging from 0 to 1, with 1 being the Herfindahl when a lender holds 100% of the loan). |
| Lead Share (per cent kept by the lead bank) | Dealscan | Following Sufi (2007), percentage retained by the lead bank of a syndicated loan. |
| <i>Other loan characteristics</i> | | |
| Loan amount (ln) | Dealscan | Natural logarithm of loan amount in USD million as indicated in the field <i>DealAmt</i> in Dealscan. |
| Loan maturity (months) | Dealscan | Maturity (in months) of the largest facility within-loan package that starts at the loan origination date. |
| Collateral | Dealscan | Dummy equal to one if the loan is secured, and zero otherwise. |
| Covenant | Dealscan | Dummy equal to one if the loan has at least one financial covenant (considering equity sweeps, debt sweeps, asset sweeps, dividend restrictions, and secured debt), and zero otherwise. |
| Institutional investors | Dealscan | Dummy equal to one if at least one institutional investor is in the loan syndicate. Institutional investors include all lenders labeled in DealScan as 'institutional investor', 'finance company', 'insurance company', 'mutual fund', or 'pension fund'. |
| Number of tranches | Dealscan | Number of facilities in the loan package |
| Deal includes term loan (dummy) | Dealscan | Dummy equal to one if the deal contains a term loan facility, and zero otherwise. |
| Loan purpose | Dealscan | Purpose of the of the syndicated loan. Based on labeling in DealScan, eight categories are considered: acquisition line; capital expenditure; corporate purposes; debt repayment; project finance; takeover; working capital; other. |
| <i>Syndicate reputation</i> | | |
| Syndicate reputation: lead to participant | Dealscan | Following Ivashina (2009), the maximum per cent number of deals arranged by the same lead bank with the same participants against the total number of deals organized by the lead bank over a five-year horizon. |
| Syndicate reputation: reciprocal | Dealscan | Following Ivashina (2009), dummy variable is equal to one if the same lead bank and the same participant switch roles over a five-year horizon prior to the current syndication. |
| <i>Borrower characteristics</i> | | |
| Private firm | Compustat | Dummy variable equal to one if the borrower is not a publicly traded company. |
| Total assets | Compustat | Total assets in US millions of dollars. |
| Profitability (ROA) | Compustat | Ratio of net income to total assets. |
| Leverage | Compustat | Ratio of book value of total debt to book value of assets. |
| Tangibility | Compustat | Ratio of tangible fixed assets (Net Property, Plant and Equipment) to total assets. |
| HP-constrained | Compustat | We identify financially constrained firms as firms whose HP index is above the median of the HP Index, and construct a binary variable accordingly. HP Index is built mirroring the approach proposed by Hadlock and Pierce (2010) as: $-0.737 \times Size + 0.043 \times Size^2 - 0.040 \times Age$, in which Size is the log of total assets, and age is the number of years of a company's initial public stock offering (IPO date) reported in Compustat. Age is set equal to zero when the IPO date is not reported. |
| Green Industry | Compustat | Green industries are classified as those that produce green goods and services following the U.S. Bureau of Labor Statistics |

| | | |
|---|--|--|
| Hight Tech Industry | Compustat | High-tech sectors can be defined as industries having high concentrations of workers in STEM (Science, Technology, Engineering, and Mathematics) occupations following the U.S. Bureau of Labor Statistics. |
| Smaller Borrower | Compustat | Firms in the first quartile in terms of total assets per year. |
| State-owned borrower | Orbis | Firms in which the government owns, directly or indirectly, an equity stake exceeding 50%. |
| Politically connected borrower | Faccio (2006) | Firms, their controlling shareholders, and top managers are members of national parliaments or governments. |
| Altman Z-score | Compustat | $1.2 * (\text{Net working capital}/\text{Total assets}) + 1.4 * (\text{Retained earnings}/\text{Total assets}) + 3.3 * (\text{Earnings before interest and taxes}/\text{Total Assets}) + 0.6 * (\text{Market value of equity}/\text{Book value of liabilities}) + 0.99 * (\text{Sales}/\text{Total assets})$. |
| <i>Lead bank characteristics</i> | | |
| Lead bank is former lender for borrower | Dealscan | Dummy equal to one if the lead bank lent to the same borrower in the past five years (as the lead bank in the syndicate), and zero otherwise. |
| The lead bank is foreign | Dealscan | Dummy equal to one if the lead bank is not in the same country as the borrowing firm, and zero otherwise. |
| <i>Characteristics of other lenders</i> | | |
| 'Top' industry and country | Dealscan | Dummy equal to one if industry and country of the borrowing firm is the industry (2-digit SIC) and the country with the highest participation of lender i in the last five years before the origination year t of the syndicated loan j , and zero otherwise. |
| <i>Country characteristics</i> | | |
| Bank Z-score | World Bank (Global Financial Development database) | Bank Z-score compares the buffer of a country's commercial banking system (capitalization and returns) with the volatility of those returns. This measure is estimated as $(\text{ROA} + (\text{equity}/\text{assets}))$ divided by $\text{sd}(\text{ROA})$; where $\text{sd}(\text{ROA})$ is the standard deviation of ROA. ROA, equity, and assets are country-level aggregate figures. |
| Market Capitalization | World Bank (Global Financial Development database) | It is the market capitalization excluding the top 10 companies to total market capitalization (%). It represents the value of listed shares outside of the largest 10 largest companies to total value of all listed shares. |

Table B3: List of Development Banks

| | Loan Volume (US\$ mio) | Number of Loans |
|---|---------------------------|--------------------|
| <i>All development banks</i> | 866,444 | 800 |
| KFW BANKENGRUPPE | 217,233 | 110 |
| EXPORT DEVELOPMENT CANADA [EDC] | 143,201 | 114 |
| ICO [INSTITUTO DE CREDITO OFICIAL] | 97,664 | 32 |
| BANCO DO BRASIL | 87,895 | 20 |
| KOREA DEVELOPMENT BANK | 56,467 | 162 |
| CHINA DEVELOPMENT BANK [CDB] | 28,667 | 35 |
| EXPORT-IMPORT BANK OF INDIA | 26,337 | 47 |
| BANK OF MAHARASHTRA | 26,227 | 30 |
| BLADDEX [BANCO LATINOAMERICANO DE COMERCIO EXTERIOR SA] | 19,725 | 7 |
| DEVELOPMENT BANK OF JAPAN INC | 18,882 | 38 |
| EUROPEAN INVESTMENT BANK [EIB] | 17,411 | 2 |
| INFRASTRUCTURE DEVELOPMENT FINANCE CO LTD | 14,790 | 30 |
| EXPORT IMPORT BANK OF THE UNITED STATES | 13,576 | 12 |
| MCC SPA [EX-MEDIO CREDITO CENTRALE] | 12,973 | 4 |
| POWER FINANCE CORP LTD | 12,018 | 10 |
| EXPORT-IMPORT BANK OF CHINA [CHINA EXIMBANK] | 9,518 | 14 |
| EXPORT-IMPORT BANK OF THE REPUBLIC OF CHINA | 9,492 | 30 |
| BANCOMEXT | 7,367 | 3 |
| WORLD BANK | 5,896 | 8 |
| NATIONAL AGRICULTURAL COOPERATIVE FEDERATION | 5,628 | 18 |
| INDUSTRIAL DEVELOPMENT BANK OF INDIA | 4,489 | 3 |
| EXPORT-IMPORT BANK OF KOREA | 3,129 | 15 |
| IRFIS MEDIO CREDITO DELLA SICILIA SPA | 3,112 | 1 |
| GOVERNMENT SAVINGS BANK | 2,865 | 1 |
| EKSPORTKREDITT NORGE AS [EXPORT CREDIT NORWAY] | 2,825 | 6 |
| CAISSE DES DEPOTS ET CONSIGNATIONS [CDC] | 2,743 | 1 |
| EXPORT-IMPORT BANK OF THAILAND | 2,537 | 3 |
| BANOBRAS | 2,264 | 1 |
| EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT EBRD | 1,675 | 6 |
| CAISSE DE DEPOT ET PLACEMENT DU QUEBEC | 1,571 | 4 |
| GARANTI-INSTITUTTET FOR EKSPORTKREDITT [GIEK] [NORWEGIAN GUAR INST FOR EC] | 1,469 | 8 |
| JAPAN BANK FOR INTERNATIONAL COOPERATION | 1,239 | 3 |
| RURAL ELECTRIFICATION CORP LTD | 1,179 | 1 |
| EXPORT FINANCE AND INSURANCE CORP | 907 | 2 |
| SVENSK EKSPORTKREDIT AB PUBL [SEK] [SWEDISH EXPORT CREDIT CORP] | 853 | 1 |
| EKSPORT KREDIT FONDEN | 542 | 1 |
| CASSA DEPOSITI E PRESTITI SPA [CDP] | 483 | 1 |
| INTERNATIONAL FINANCE CO KSC [IFC] | 355 | 3 |
| INDONESIA EXIMBANK | 315 | 2 |
| NEDERLANDSE FINANCIERINGS-MAATSCHAPPIJ VOOR ONTWIKKELINGSLANDEN NV [FMO] | 302 | 2 |
| FINNISH FUND FOR INDUSTRIAL COOPERATION | 212 | 2 |

| | | |
|---|-----|---|
| NORDIC INVESTMENT BANK | 150 | 1 |
| INSTITUTO CATALAN DE FINANZAS [ICF] | 103 | 2 |
| NATIONAL FEDERATION OF FISHERIES COOPERATIVES | | |
| SUHYUP BANK | 95 | 2 |
| NORTH AMERICAN DEVELOPMENT BANK | 45 | 1 |
| PAK OMAN INVESTMENT CO LTD | 7 | 1 |
