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Steven Poelhekke, Razvan Vlahu and Vadym Volosovych*

De Nederlandsche Bank NV
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1000 AB AMSTERDAM
The Netherlands

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Steven Poelhekke[1,4]   Razvan Vlahu[2]   Vadym Volosovych[3,4]

[1] *University of Auckland and CEPR*

[2] *De Nederlandsche Bank*

[3] *Erasmus University Rotterdam*

[4] *Tinbergen Institute*

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Abstract

Using a large dataset of firm-bank and ownership information for 23 European countries over 2008-2015, we study the dynamics of bank relationships after corporate acquisitions and the effects of changing banks on firm performance. Foreign acquirers do not rely on internal capital markets but keep targets' domestic banks. With more domestic banks, firms increase fixed capital and trade credit. In contrast, domestic acquirers remove domestic but add foreign banks. The latter mainly help reduce the cost of financing. We further explore firm and bank heterogeneity and confirm cost of financing and information asymmetry as plausible reasons to change banks.

JEL: D82; E51; F36; G21; G34.
Keywords: Acquisitions; Firm-bank relationships; Firm financing; Operating performance

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1 Introduction

It has been long recognized that banks play an important role in providing access to finance for firms that cannot borrow from capital markets directly (Diamond, 1991). While most firms have a relationship with a single bank, many firms have more than one bank relationship (Ongena and Smith, 2000b) that may evolve over time. In this paper we study the dynamics of firm-bank relationships and the implications of changing banks for the performance of client-firms. Having multiple bank relationships can reduce hold-up problems (Rajan, 1992) that generally make it difficult to switch banks, even though switching banks could improve a firm's access to credit (e.g., Ioannidou and Ongena, 2010).[1] Conversely, the subsidiaries of domestic or foreign parent firms may rely less on bank lending because larger internal capital markets would provide funding instead (e.g., Manova et al., 2015).[2]

A change of a firm's ownership due to acquisition may, therefore, result in a change of the number and composition of bank relationships with *a priori* unclear implications for firm financing and overall firm performance. At the same time, the globalisation of banking, as recently reviewed by Claessens (2017) and Buch and Goldberg (2020), has made it possible to have bank relationships with both domestic and foreign banks, giving acquirers the opportunity to also choose the nationality of bank relationships. Relatively little is known about these dynamics, even though the creation and termination of bank relationships matter for the aggregate effects that bank-level and monetary shocks have on the economic performance of borrowing firms and the aggregate lending and investment (Amiti and Weinstein, 2018).

An acquisition is a major event for a target firm, and we use the foreign and domestic corporate acquisitions as a shock and study how bank relationships change from a year before to the year after the acquisition, relative to non-acquired firms. We then investigate changes in firm outcomes over two years for the firms that experience changes in bank re-

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[1] See also Greenbaum et al. (1989), Sharpe (1990), Von Thadden (1995) for theories explaining how banks can exploit their information monopoly position when the information is private to the lender and not transferable by the borrowers to others.

[2] See also Erel et al. (2015), Buchuk et al. (2014), Larrain et al. (2018) for further evidence on the role of acquisitions in relieving financial frictions in target firms. Stein (1997) describes the theoretical differences between bank lending (as in Diamond 1984) and lending by the corporate headquarter, associated with the control authority over the firm.

lationships, relative to the firms that did not see changes in bank relationships. In both analyses we attempt to address endogeneity concerns with a combination of granular fixed effects, difference-in-difference, and matching techniques. We find that, on average and during our sample period, non-acquired firms reduced bank relationships by dropping domestic banks. Relative to that trend of consolidation, foreign acquirers are less likely to add foreign banks and more likely to keep their domestic banks (not drop them). When firms add domestic banks the firms' investment in fixed capital and trade credit increase but at a cost of higher interest expenditure. Two years after adding a domestic bank fixed assets are 4.4% higher compared to the year before the bank was added. Trade credit grows by 6.4% and interest expenditures grow at 10.6%. These average investment promoting effects are driven by more "linked" banks, which have relationships with a larger share of the local economy or are present in many locations, and to some extent by the degree to which those banks are specialists in the firm's sector of operation. We interpret these findings as evidence of an information advantage offered by domestic banks, because they can rely on their existing relationships with firms from the same market and on their expertise in specific sectors.

In contrast, domestic acquires, which likely suffer less from information asymmetry about local markets, churn and reduce domestic bank relationships but add foreign banks. These effects are more pronounced for target firms in less financially developed countries. Firms adding foreign banks enjoy a reduction in the cost of financing (average interest rate on total debt goes down by 3.4 percentage points), with no visible changes in the amount of loans. We observe these effects only in financially constrained firms. The cost-of-finance-reducing effect of foreign banks is also driven by the degree to which those foreign banks are linked. However, we also find that adding more linked foreign banks depresses lending and the firm's investment in working capital, which is consistent with the idea that banks have to ration funds among its clients. Conditional on being linked and specialized, adding foreign banks increases firm loans, long-term debt, investment in working capital, and profitability, despite a higher interest cost.

For our analysis, we assemble a unique and large firm-bank panel dataset for 23 European

countries over 2008-2015 using Orbis, Orbis Bank Focus (formerly Bankscope), and Orbis Ownership databases by the Bureau van Dijk (BvD).[3] Our dataset contains information on the firm balance sheet, financial and operating outcomes, the type and nationality of owners, ownership changes, and stakes owned. In addition, we track all firms' bank relationships over time, the bank nationality, their ultimate owner and activity in terms of size, sector, and geographical network in the country of the client-firm. To ensure a good quality of matching, we impose the rather stringent requirement that we can follow firms for at least five years, and that we observe their bank relationships in each year. Our final dataset includes listed and unlisted firms of various sizes, with single and multiple bank relationships, covering a comprehensive part of the European economy. This permits us to observe a dense network of bank relationships with the local firms, which is helpful when we want to verify a bank's prior presence in a particular market and exploit bank heterogeneity along several dimensions.

First, we study what happens to existing firm-bank relationships when an entity acquires a controlling equity stake in a firm, conditional on the initial ownership structure, fixed effects and firm-level trends, where we distinguish between domestic and foreign acquirers and between domestic and foreign banks. To deal with the possibility that acquirers select target firms based on their bank relationships, we explicitly control for whether acquirers and targets shared the same bank relationships before the acquisition.

Second, by combining a difference-in-difference approach with a matching estimator and granular controls for credit demand, we study the effect of changes in the number of domestic and foreign bank relationships on balance sheet items, the cost of financing, and selected real outcomes of individual firms. To create a missing counterfactual of how firms would have performed in the absence of a change in bank relationships, we find a control group of firms similar in terms of observable characteristics, such as similar firm size and growth, the same acquisition history and the number of initial bank relationships. In order to isolate

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[3]BvD's Orbis database is nationally representative and internationally comparable as was shown by Kalemli-Ozcan et al. (2015) who described and validated this data. We follow their guidance to clean and harmonize the financial and ownership data, and manually check bank names to make sure we follow unique banks. Orbis Bank Focus superseded the Bankscope database, commonly used in the banking literature, after the acquisition of BvD by Moody's in 2017.

the causal effect of the supply in bank relationships, we follow Degryse et al. (2019) and control for local demand for banking services through matching firms within the same assets decile, the narrowly defined industry, year, and city. We then compare changes in various aspects of firm performance between the year before a change in bank relationships and years following the change among the "treated" firms and the control group consisting of firms that did not experience changes in bank relationships. If the decision to change banks was driven by observable firm characteristics or local credit demand conditions, it will be controlled for through the matching exercise. If it was driven by unobservable time-invariant heterogeneity, it will be controlled for through the difference-in-differences approach. Because we consider a relatively short time horizon, this method will capture developments such as a permanent productivity increase experienced by the firm. Furthermore, to examine the channels underpinning the effects we introduce heterogeneity of firms, in terms of the degree to which they are credit constrained, and of banks, by measuring the size, sector, and geographical distribution of their clients. This helps us to distinguish between possible motivations to change banks such as access to and cost of finance or information asymmetry.

Our work complements and expands several literatures. First, we contribute to the growing literature on relationship banking and especially to the narrower literature studying reasons of changes in bank relationships.[4] The theoretical literature mostly identifies borrower's characteristics, such as firm's valuable proprietary information (Bhattacharya and Chiesa, 1995), the degree of financial distress (Von Thadden, 2004), or financial constraints (Bolton and Schrafstein, 1996), as determinants of the number and changes of banking relationships. Empirical evidence points to country and institutional differences behind the average number of bank relationships per firm across countries (Ongena and Smith, 2000b).[5] Empirical work on bank switching emphasizes firms' desire to improve their financial position through "managing" their banking relationships, recognizing that existing relationships

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[4]For surveys of the literature on relationship lending see Boot (2000), Ongena and Smith (2000a), Degryse and Ongena (2001), Berger and Udell (2002), Kysucky and Norden (2016).

[5]In some countries (e.g., Norway, Sweden, U.K., U.S.), firms maintain few bank relationships, while in others (e.g., Italy, Portugal, Spain), they maintain considerably more. Ongena and Smith name institutional factors such as inefficient judicial systems, poor enforcement of creditor rights, fragmented but stable banking systems, and active public bond markets contributing to firms maintaining more bank relationships.

may limit bank switching, as summarized by Boot (2000).[6] The existing empirical evidence shows that the switch is likely to be triggered by the firms themselves in order to expand their access to credit and capital market services (Ioannidou and Ongena, 2010, Gopalan et al., 2011), and small and highly leveraged firms are more likely to end a lengthy banking relationship (Ongena and Smith, 2001, Farinha and Santos, 2002). We complement this literature demonstrating that firm acquisition is an additional reason to change banks, where the switch to/from a bank is likely to be initiated by the new controlling shareholder. In addition, we are first to show that the motives for switching depend on the identity of the new owner: specifically, foreign acquirers seem to be more interested in the information advantage of the existing and mostly domestic banks (because foreign banks have informational disadvantages in local markets as per Beck et al. 2018), while domestic acquirers are interested in additional or cheaper financing offered by added foreign banks. Martinez Peria and Mody (2004) and Giannetti and Ongena (2012) also show these benefits of foreign banks, by focusing on acquisitions between banks. We differ from the latter papers by studying the consequences of acquisitions of industrial firms.

Second, we add to the literature on firm-bank relationships and firm financing by focusing on the dynamic effects of bank relationships. Most theories imply that the effect of close firm-bank ties on the cost of funds is ambiguous, but, in general, a lender's willingness to provide funds should increase when it acquires more private information about the existing borrowers (Boot and Thakor, 1994). The empirical evidence on the impact of the firm-bank relationship on the cost of funds is mixed too. For the U.S., Petersen and Rajan (1994), Berger and Udell (1995), Bharath et al. (2011), and Ivashina and Kovner (2011), among others, find that longer relationships with fewer banks are associated with a decrease in loan rates. Conversely, for many European countries, there is evidence that relationship borrowers are charged higher rates (see Angelini et al., 1998, Harhoff and Korting, 1998, among others) or suffer a reduction in the supply of loans from their incumbent bank once they use outside

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[6]Papers cited in footnote 1 provide the theoretical arguments for the informational monopoly by the current banks that may preclude bank switching.

loans from other lenders (Degryse et al., 2016).[7] We complement this literature and provide novel evidence on the impact of changes in firm-bank relationships—also varying by the nationality of banks, the extent of their links to local firms and presence in local market, or their specialization in a particular industry—on the availability and cost of financing for firms, as well as on their economic outcomes. Our results, thus, point to the importance of managing bank relationships as part of the broader firm's financing policy.

Third, our paper complements the large literature on the effects of supply-related banking shocks on borrowing at the firm level, following the natural experiment approach of Khwaja and Mian (2008).[8] While we rely on this literature to conceptualize the distinction between supply and demand factors that may trigger a change in banking relationships, the focus of our analysis is different. Most of these papers (with the notable exception of Amiti and Weinstein 2018) rely on existing firm-bank relationships, and typically on firms with at least two banks for their identification strategy and do not look at the *dynamics* of the firm-bank relationships or the firms with one bank. We depart from this approach and focus our attention specifically on changes of firm-bank relationships and their impact on firm outcomes, including the cost and volume of loans on a firm's balance sheet. In our data source, firms report the total amount of loans, the name of the banks that they have relationships with, but not the loans they have with these specific banks. For us, this limitation is not a disadvantage because we ask what is the impact of an *additional* bank relationship (the extensive margin of relationships) on firm outcomes, as opposed to the deepening of the existing relationship through additional loans or services (the intensive margin). With our identification strategy, we interpret changes in bank relationships as shocks in the supply of banking services in a broad sense and separate these shocks from

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[7]The explanations for these divergent results reside with the variation of definitions of what constitutes a firm-bank relationship (e.g., repeated past lending interactions vs. firm own assessment) and on what type of financing cost is considered as the dependant variable.

[8]Khwaja and Mian (2008) study bank liquidity shocks due to reductions of dollar-denominated deposits caused by unexpected nuclear tests in Pakistan. Gan (2007) and Jimenez et al. (2012) explore loan supply shocks triggered by a fall in real estate prices and an increase in short-term policy rates, respectively. More recently, Acharya et al. (2018, 2019) study the real effects of the sovereign debt crisis and unconventional monetary policy, while Chodorow-Reich (2014) and Amiti and Weinstein (2018) show that supply shocks are associated with the fall in employment and aggregate investment.

credit demand shocks attributed to the firm itself.

Finally, our paper relates to the literature on the impact of merger and acquisition (M&A) activity and foreign direct investment (FDI) on firm performance. Most of the existing studies in finance have found that M&As seem to create shareholder value, with target firms being the main beneficiaries (see surveys by Andrade et al., 2001, Betton et al., 2008). The literature on M&As in other fields focus on operational and financial synergies, access to better technology, improved organizational structure and corporate governance (see Hoberg and Phillips, 2010, Bena and Li, 2014, among others), or the positive productivity effects for acquired foreign affiliates (Javorcik, 2004, Guadalupe et al., 2012, Javorcik and Poelhekke, 2017, Fons-Rosen et al., 2021).[9] The literature of M&A and firm financing show that acquired firms exhibit an increase in investment, lower cash holdings and sensitivity of cash or investment to cash flow (Erel et al., 2015), as well as higher leverage and return on equity than other firms (Buchuk et al., 2014), with target firms operating in relatively underdeveloped credit markets benefiting more (Manova et al., 2015). The findings from this latter literature suggest that the interplay between internal and external capital markets and the welfare and efficiency implications may be quite complex. Our paper uncovers a new potential effect of corporate acquisitions on firm performance, focusing on the changed bank relationships following a change in controlling ownership. We combine these distinct strands of literature by interpreting an acquisition event as a shock that may generate changes in bank relationships. Guided by the literature on relationship banking and the effects of financing shocks on firm performance, we use difference-in-difference analysis combined with matching techniques to study the causal effect of changes in bank relationships on firms economic outcomes.

The rest of the paper proceeds as follows. Section 2 describes the construction of our dataset and some patterns observed in banking relationships. In Section 3 we discuss empirical challenges and how we address them methodologically. Section 4 presents the results and Section 5 concludes.

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[9]The literature recognizes the difficulties in establishing the causal effects of acquisition due to endogenous selection of potential targets. The would-be owners may select firms that are likely to have increased productivity growth based on various features of the acquired firms that may be observed or unobserved by an econometrician.

2 Data

Compiling the dataset

We construct a database of firm ownership over time, firm-bank relationships, and outcomes at the firm level based on the Orbis database by the Bureau van Dijk. Every annual vintage provides information on firms' financial and productive activities from balance sheets and income statements, together with detailed information on firms' domestic and international ownership structure. We prepare the financial and ownership data as recommended in Kalemli-Ozcan et al. (2015) to create a panel, reduce the survivor bias present in direct Orbis downloads, and ensure good coverage of historic data for ownership and financials. This results in a panel of 39 European countries over 1999-2015. We exclude firms that are owned by banks directly.

In addition, we collect information on the firm's banks, also available in Orbis since the 2010 vintage. Similar to ownership data, bank data comes from individual vintages of the Orbis database. We collect all the bank information from vintages 2010-2015.[10] This data originates from the Kompass database and has been used before by Ferrando et al. (2019) and Kalemli-Ozcan et al. (2019). However, they used a cross-section of firm-bank relationships observed for eight Eurozone countries in 2014 and 2013, respectively, and focused attention on the 'main bank' (assumed to be the bank that is listed first). Closer to our paper, Giannetti and Ongena (2012) used 2000 and 2005 vintages for 13 Eastern European countries to track changes in bank relationships over time, but focused on foreign bank entry through acquisition of a domestic bank and whether any relationships were added or dropped between these dates. They also show that the banker information from Kompass is broadly consistent with independent surveys, such as the EBRD-World Bank Business Environment and Enterprise Performance Survey (BEEPS).

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[10]The date of banking information, per firm, is not codified, but from our conversation with the BvD representatives, we learned that the primary source of the bank data is firms' annual reports. Consequently, we assume that the date of banking information corresponds to the latest year of financials for each firm in a given vintage (for example, if the available variable 'latest year' for financials is 2013, we assume the same timestamp for the bank information).

Compared to these papers, we dramatically expand coverage to up to eleven years (2005-2015) and across 23 countries and we track *all* bank relationships over time, making use of the panel structure of our firm-level data.[11] We can thus reveal novel descriptive evidence of substantial churning in bank relationships. Besides, we differentiate the nationality of the bank relative to that of the firm. We define the foreign status of a bank with respect to the host country of the target firm. For example, if a firm in Austria reports a bank relationship with Commerzbank AG, which Bankscope or Orbis Bank Focus lists as a German bank, we designate this relationship as foreign. Specifically, we investigate, in the order of priority, i) the nationality of bank's shareholder from most recent Orbis Bank Focus (the new BvD product that replaced Bankscope database when it decommisioned by Moody's), ii) the nationality of the global ultimate owner of the bank from the same source, and iii) the legacy ID of the bank from the older vintage of the Bankscope database.[12] Finally, we conservatively checked if the original spelling of the bank name contains the foreign endings capturing the legal form (such as, for example, Dutch "BV" or "NV" meaning, correspondingly, "private limited liability" or " a public limited liability" firm for the banks operating outside of the Netherlands) or foreign parts of names (including mentioning the city name or similar). Similarly to the literature on firm-level FDI, we assume that the bank is domestic if we cannot find the information on its nationality or its owners in our data or on the Internet.

Our treatment is a change in ownership in non-financial firms. We focus on changes where the new owner (domestic or foreign) acquires a stake such that its ownership amounts to more than 50%, but had a smaller than 10% stake before the acquisition. The threshold of 10% is in keeping with the traditional definition of (foreign) direct investment, which assumes a certain degree of influence over the firm. At the same time, smaller stakes are conventionally considered portfolio investments. Control firms do not change owner (but we

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[11]The 23 countries are Austria, Bulgaria, Germany, Denmark, Spain, Estonia, France, the UK, Greece, Hungary, Croatia, Ireland, Iceland, Lithuania, Latvia, Moldova, North Macedonia, Poland, Portugal, Russia, and Ukraine.

[12]All the Orbis Bank Focus data was matched to our banks by normalized name using fuzzy-match app of Microsoft with very stringent rule ruling out multiple banks due to different spelling of the names. After the match, we manually reviewed the matches.

allow them to change small, i.e. <10%, stakes).[13] This definition of treatment ensures that the firms experience a major change of ownership, which has a meaningful chance of leading to a change in banking relationships, among other things.

For our analysis, we retain firms for which we know the bank name and firm ownership and that report financial data for at least 5 consecutive years (up to two years before and two years after the acquisition) to analyze the potential effects of the relationship change on the target firms. We thus end of up with 96% of observations on firms' bank relationships concentrated in the years 2009-2013, while we observe financials for two additional years.

Appendix Tables A1.1 and A1.2 provide details for an example firm in Spain. We observe this firm's bank relationships for five consecutive years (as listed), but its ownership for more years, which shows that it was acquired by a domestic firm in 2009. Its bank relationships changed over time, with banks being dropped on three occasions and banks being added on three other occasions. One of these new banks, Banco Caixa General, has a foreign bank owner with Portugal as its home country.

In sum, our combined dataset contains 1.2 million observations, for 11 years and 23 countries, with most data concentrated in the period 2009-2013.

Bank relationships across firms and time

In our dataset, 60% of firms report at most one bank in a given year, 20% of firms report two banks and another 20% report at least three bank relationships in a given year. On average, firms have 1.6 bank relationships (see also Table 1). Still, this number is declining over time during the period analyzed, consistent with a backdrop of consolidation that may be related to the global financial crisis.[14]

Looking at detailed changes shows the degree of churning of bank relationships. On average, 11% of firms increased the number of relationships by adding one or more banks in any given year, and 9% reduced relationships by dropping one or more banks. The

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[13]We thus exclude firms where, say, ownership was divided 40-60 before acquisition and becomes 55-45 after.

[14]For comparison, Japanese stock market listed firms report a median of seven bank relationships between 1990 and 2010 (Amiti and Weinstein, 2018).

additions and terminations of relationships over a two-year window increase to 13% and 14%, respectively. Moreover, 6% replaced relationships while keeping the total number of relationships constant. Even firms with only one bank replace their bank in 5% of firm-years (which in all cases is a change of domestic banks).[15]

We relate this to changes in firm ownership and show more details in Table 1, which reports the descriptive statistics for bank relationships, split between the firms which never experienced ownership change in Group 1, had a non-controlling ownership change (less than 50% stake, Group 2), and majority acquisitions (more than 50% acquired, Group 3). Panel A reports the number of bank relationships by these sub-groups. Firms in our sample have, on average, 1.5 domestic bank relationships and only 0.06 foreign bank relationships. Among all firm-year observations, 5.4% report at least one foreign bank. The distribution of bank relationships is very skewed, with the 75th percentile of 2 and the maximum of 22 unique banks (or in the range of 5-15 banks, excluding this maximum in Russia). Given our large sample sizes, these average numbers are not surprising. Firms that ever experienced an acquisition tend to have slightly more bank relationships.

Panel B shows the changes in bank relationships from the year before the ownership change (t-1) to the year after (t+1). This is a net change taking into account adding and dropping the relationship over two-year intervals. We observe the overall decline in the number of bank relationships in Group 1 and 2, driven by domestic bank relationship dynamics. In Group 3, of the majority acquisitions, the overall number of bank relationships increases without sacrificing the domestic relationships much. In all these groups, if foreign bank relationships change, the changes are positive, so the number of foreign banks in our sample on average increases.

Panel C shows the number of banks added and dropped to demonstrate what lies behind these net changes. It confirms the patterns of net changes from Panel B and shows that most of the action comes from replacing domestic banks. There appears to be more churning of bank relationships in ever-acquired firms. Overall, the acquisition seems to be related to

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[15]The share of firm-years in which single-bank firms switch bank is very different by country: it is only 0.7% in Russia, 3% in Germany and 15% in Portugal.

rethinking bank relationships at the target-firm level.

In Table 2 we decompose the added banks by nationality relative to that of the firm and whether these banks are familiar with the country of the target (based on other identified relationships in our sample) or the acquirer. We can see that almost all the added foreign banks in our sample are not new to the country and neither new to the acquirer. This means that new owners tend to bring their own foreign bank (if they do so), and these foreign banks are already present in the country. There are more instances when added domestic banks are new to the acquirer. Their share is still small relative to the total number of added domestic banks. Target firms thus adopt bank relationships of the new parent.

3 Hypotheses and empirical methodology

We study whether bank relationships change after non-financial firms' acquisitions and whether changes in bank relationships have an independent effect on the firms' operations and access to credit. We address each question in turn.

3.1 Acquisitions and changes in bank relationships

The expected direction of change of bank relationships after an acquisition event is not clear a priori. For example, a growing firm may have a positive demand for banking relationships and new funding sources and simultaneously be an acquisition target. We would expect a positive effect of the acquisition on the number of banking relationships, ceteris paribus, due to this demand effect. Second, the supply of banking relationships may be a by-product of the acquisition. Still, the direction in which the acquisition affects the supply is ambiguous.[16] On the one hand, acquirers may crowd-out bank lending by direct financing via internal capital markets, such that the number of bank relationships may drop. On the other hand, bank relationships may be added because acquirers facilitate borrowing by increasing the

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[16]Kashyap et al. (1993), Kroszner et al. (2007) and Adrian et al. (2012) show that some firms can substitute loans for other types of borrowing in the presence of loan supply shocks. Khwaja and Mian (2008) find that this is hard for small firms. In contrast, Hubbard et al. (2002) show that firms, in general, have difficulty replacing loans from one bank with loans from another.

new entity's creditworthiness. The theoretical effect of acquisition on bank relationships is thus ambiguous and provides little guidance as to whether this differs by bank nationality.

To answer this question empirically, we would ideally run an experiment assigning acquisition randomly to firms, but this is not feasible given our setting of relatively rare acquisition events combined with coverage of various countries, which is not suitable for a natural experiment. To estimate the effect of acquisitions on bank relationships, we exploit the panel nature of our data and start with the following difference-in-difference specification, where we examine how the portfolio of a firm's bank relationships changes over time between firms that were acquired and firms that were not acquired:

$$\Delta \mathbf{BR}_{i,c,t+1} = \mathbf{ACQ}_{i,c,t}\,\gamma_1 + \mathbf{X}_{i,c,t}\,\gamma_2 + \alpha_i + \delta_{s4,t} + \zeta_{i,c,t}\,, \tag{1}$$

where $\Delta BR_{i,c,t}$ stands for the change of the number of banking relationships for firm i in country c from year $t-1$ to $t+1$[17], $\mathbf{ACQ}_{i,c,t}$ is a vector of binary variables reflecting a change in ownership: domestic or foreign acquisition with the resulting stake of 50 percent or more.[18] We define foreign acquirers as those that have their headquarters in a different country than the target.

The identifying assumption is that acquiring firms do not select target firms based on underlying trends in the development of the target's bank relationships over time. The matrix $\mathbf{X}_{i,c,t}$, therefore, consists of controls that correlate with changes in bank relationships and the probability of acquisition. While we cannot exclude selection entirely, we can control for whether a target and parent shared the same bank before the acquisition and thus whether they already had an indirect relationship. We thus rule out that an information advantage drives acquisitions via bank relationships that are shared before the acquisition event. This is important because a smaller degree of asymmetric information between target and acquirer

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[17]We focus on a two-year period in our main results and more persistent changes because we find a temporary peak in bank relationships in the year of acquisition: these may be (investment) banks involved in the acquisition directly.

[18]That is, the variable *(foreign or domestic) acquisition* takes the value of one if in year t the firm was acquired by a (foreign or domestic) shareholder who owned zero or less than 10 percent of the target's equity at $t-1$. Data Section 2 has more details on the definitions of variables.

may make acquisition more likely in the first place and mechanically reduce the likelihood of a change in bank relationships. We also include the lagged ownership structure, such as foreign-owned firms, join-ventures, firms without a single controlling owner, and the number of shareholders. Because we regress changes in bank relationships on changes in ownership, we control for firm fixed effects and exploit the time variation within firms. In addition, we control for firm-specific linear trends α_i. In other words, we control for all observable and unobservable characteristics of firms that do not change in the space of five years or change in a linear fashion. Finally, we control for four-digit sector-year effects $\delta_{s4,t}$ that capture the sector's business-cycle stance, which may be correlated with access to finance and bank relationships and with M&A activity in the sector. We always cluster standard errors at the country-sector-year level.

We compare acquired firms to the baseline group of firms: those where we observe *no* change in controlling shareholding (with a majority stake). In the main regressions, we do not track changes in ownership shares where these shares are below the 50 percent threshold, and such events are thus also part of the baseline group of firms. For example, consider a hypothetical firm with three owners, each holding a third of shares, and one of these owners is foreign. If a domestic owner sold its one-third share to a second (and thus new) foreign owner, we do not consider this to be a majority acquisition because no single owner gained control of the firm. If, instead, either of the three owners sold its stake to another one of the existing three owners, the firm would have two owners next period. One of them would have a controlling stake, which we then count as a majority acquisition by an existing owner. In the robustness tests we drop from the control group all firms where the ownership shares stay below 50 percent before and after the change in ownership.

3.2   Real and financial effects of changes in bank relationships

In the second part of the analysis we assess whether new bank relationships have real and financial effects on firms. To separate the effect of acquisition from that of a change in bank relationships, we include all acquired and non-acquired firms in the analysis and control for

whether a firm was acquired in each of the past years.

The first challenge is to separate a change in bank relationships from credit demand shocks: firms that add bank relationships may do so because of high credit demand. Moreover, they may find it easier to improve access to finance for other reasons such as higher productivity. Typically, the banking literature uses granular matched bank-firm-loan data and firms that borrow from multiple banks to separate firm borrowing shocks from bank supply shocks (see, for example, Khwaja and Mian (2008)).[19] Because our data includes many firms with one bank relationship before they may add a second relationship, and to isolate a causal effect, we estimate regressions for firm-level outcomes conditional on highly granular demand effects following Degryse et al. (2019).

Specifically, we construct firm-year cells with the same country, two-digit sector, year, location (city), and asset-decile. By assigning firms (which benefited to a different degree from changes in banking relationships) to these narrowly defined clusters, we control for local and sector loan demand and any observed and unobserved borrower characteristics shared by firms in the same cell that might influence loan outcomes.[20] Degryse et al. (2019) show that this approach leads to very similar results as the regression with firm fixed effects and does not create any bias in the estimation.[21]

We combine this with a matching method to control for selection of the firms that change bank relationships, which is feasible because a change in bank relationships is much more common than acquisition events. This allows us to isolate the impact of changes in bank relationships, which we interpret as a change in the supply of relational bank credit and other services, on the balance sheet and real outcomes. Matching creates pairs of firm-years that are equal in all observable characteristics, including the number of bank relationships at $t-1$, and whether they were acquired by a foreign firm or by a domestic firm at a specific

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[19]The non-exhaustive list of papers on firm-bank lending literature include Peek and Rosengren (1997, 2000), Klein et al. (2002), Paravisini (2008), Amiti and Weinstein (2011, 2018), Jimenez et al. (2014, 2012), Santos (2010), Chodorow-Reich (2014), Paravisini et al. (2015), and Greenstone et al. (2020)

[20]A similar firm clustering approach has been used by Acharya et al. (2018, 2019) who form firm clusters (cells) based on the firm country, industry, and rating.

[21]Such clustering approach is quite granular: close to half of our observations have no other firm in the same credit demand cluster. Within the bins of two or more firms per bin, the mean is 4.3 firms in a bin with a median of 2.

point in time. We thus compare, in each year, firms that were both acquired by a foreign firm, both acquired by a domestic firm, or neither acquired. The only observable difference is that one was 'treated' with an extra bank relationship while the 'control' was not. Since we will show that acquisition is a major driver of changes in bank relationship, we match exactly on acquisition, and thus rule out that treatment status is driven by acquisition status in the matched estimates.

For the analysis of firm outcomes, our treatment variable is the change in the number of foreign or domestic bank relationships between $t + 1$ and $t - 1$. This choice of timing is motivated by the results on acquisitions and changes in bank relationships and is further elaborated in Section 4.1. For matching of firms, we use Coarsened Exact Matching (CEM; see Iacus et al. 2011), which creates exact matches on all binary and count variables and exact matches within bins of continuous variables. This is straightforward for our many dummy variables such as acquisition status and majority foreign ownership, and for count variables such as the initial number of bank relationships. For continuous variables, we split each variable into bins to build exact matches to the extend that treated and control firms are observed in the same bin. The benefit of this method is that balancing is automatically achieved on matching variables and that it is not affected by model mis-specification. For example, it does not have to assume a probit model as is the case in propensity-score matching.[22] Our matching variables are: three lags and two leads of domestic acquisition at t, three lags and two leads of foreign acquisition at t, the number of foreign bank relationships at $t - 1$, the number of domestic bank relationships at $t - 1$, lagged majority foreign ownership, credit demand as captured by year×industry×city×asset-decile bins, seven bins of lagged employment (of 0-10, 11-20, 21-50, 51-150, 151-250, and 251-2500 workers)[23], percentile-based bins of lagged operating revenue (0-10, 11-25, 26-50, 51-75, 76-90, 91-99.9), and five

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[22]The CEM method also offers a statistic L that measures the sum of the degree of overlap between the areas of multidimensional treated and control histograms, within each matching cell that is created by the multivariate dimensions of continuous-variables bins, dummy, and count variables. Using this statistic, we find that increasing the number of bins yields a minor reduction in multivariate imbalance at the cost of greatly reducing the number of matches. Note that this statistic takes into account not just the mean but also higher moments of the distributions. In our baseline estimates, $L = 0.78$, which suggests that $100 * (1 - 0.78)\%$ of the area under the two multidimensional histograms overlap.

[23]2500 corresponds to the 99th percentile.

equally spaced bins of one and two lags of output growth and one lag of employment growth. After matching, we verify that all (control and) outcome variables are balanced between treated and control groups.

Using our matched sample, we estimate a difference-in-difference specification of the (log) change in the balance sheet and real outcome variables on the change in domestic bank relationships and the change in foreign bank relationships, thereby also eliminating firm fixed effects.

$$\Delta Y_{i,c,t+2} = \Delta \mathbf{BR}_{i,c,t+1}\, \gamma_1 + \mathbf{X}_{i,c,t-1}\, \gamma_2 + \varepsilon_{i,c,t}\,, \tag{2}$$

where $\Delta Y_{i,c,t+2}$ is a growth or change of chosen firm outcome between year t and year $t+2$ and $\Delta \mathbf{BR}_{i,c,t+1}$ stands for the change of total banking relationships between year $t-1$ and year $t+1$, for firm i in country c. Alternatively, we split $\Delta \mathbf{BR}_{i,c,t+1}$ into two variables $\Delta ForeignBR_{i,c,t+1}$ and $\Delta DomesticBR_{i,c,t+1}$ that capture foreign and domestic bank relationships, respectively. We measure ΔBR from $t-1$ to $t+1$ in keeping with the timing of the first part of the analysis. We measure ΔY from t to $t+2$ because for 98% of the firms in the sample we observe banks for 5 years from 2009 to 2013, and outcome variables up to 2015. We already use two lags in matching such that treatment takes place in 2011-2013: by focusing on an outcome horizon of $t+2$ we can include all three treatment years. Although we match on bins of lagged employment, employment growth and output growth, we also control for lagged employment growth and lagged output growth in the matrix $\mathbf{X}_{i,c,t-1}$ to wash out any remaining trends. We always cluster standard errors at the country-sector-year level. The outcome variables are real and balance sheet variables such as current liabilities, loans, assets, and employment growth, and the coefficient of interest is γ_1. We estimate these specifications by OLS and, as the robustness check, by least-absolute-deviation that models a conditional median instead of mean.

3.3 Channels: country, firm and bank heterogeneity

In the third part of the analysis we explore channels that may explain the effects. First, we ask whether country characteristics determine changes in bank relationships. For example,

parent firms that acquire target firms in financially less developed countries may find that their target firm has excess demand for financing that it cannot supply itself and benefit more from maintaining (multiple) bank relationships. To this end, we introduce a triple difference into our regressions in equation (1) by interacting the $\mathbf{ACQ}_{i,c,t}$ term with several country-level characteristics $\mathbf{FD}_{c,t}$ that in theory should be conducive to financial development and demand for financing, as:

$$\Delta BR_{i,c,t+1} = \mathbf{ACQ}_{i,c,t}\,\gamma_1 + (\mathbf{ACQ}_{i,c,t} \times \mathbf{FD}_{c,t})\,\gamma_2 + \mathbf{X}_{i,c,t-1}\,\gamma_3 + \alpha_i + \delta_{s4,t} + \zeta_{i,c,t}\,. \qquad (3)$$

A positive and significant coefficient γ_2 to the interaction term will be consistent with the interpretation that acquisitions facilitate a firm's access to finance by spreading bank relationships through the economy.

Second, we augment our matching regressions for real outcomes by interacting $\Delta\mathbf{BR}_{i,c,t+1}$ in equation (2) with firm characteristics $\mathbf{fd}_{i,c,t-1}$ that reflect firm demand for banking services as of $t-1$, prior to changes in bank relationships or acquisitions, as:

$$\Delta Y_{i,c,t+2} = \Delta\mathbf{BR}_{i,c,t+1}\,\gamma_1 + (\Delta\mathbf{BR}_{i,c,t+1} \times \mathbf{fd}_{i,c,t-1})\,\gamma_2 + \mathbf{X}_{i,c,t-1}\,\gamma_3 + \varepsilon_{i,c,t}\,. \qquad (4)$$

In particular, to test whether **financially constrained firms** benefit more from additional foreign or domestic bank relationships we include in $\mathbf{fd}_{i,c,t}$ whether firms are financially constrained as captured by the Whited and Wu (2006) index of financial constraints. The indicator takes the value of one if the firm falls in top 20th percentile of the index in a given year (where the index is computed as -0.091*(Cash flow) +0.021*(Long-term debt) -0.044*ln(Total Assets) +0.102*(2-digit industry sales growth) -0.035*(Sales growth) in each firm-year, and a higher value means more financial constraints).

Third, we investigate if the real and financial effects of additional bank relationships depend on *bank* characteristics $\mathbf{BX}_{i,c,t}$. We thus include characteristics of *banks* in the sense that firms (our unit of observation in equation (4)) have bank relationships with different types of banks. Specifically, in specification (4) we replace the interaction $\Delta\mathbf{BR}_{i,c,t} \times \mathrm{fd}_{i,c,t}$

with $\Delta \mathbf{BX}_{i,c,t}$, which includes measures representing how firm's banks are *linked to the local economy* and to what extent they are *specialized* in the sector of firm's operation, to obtain specification:

$$\Delta Y_{i,c,t+2} = \Delta \mathbf{BR}_{i,c,t+1}\, \gamma_1 + \Delta \mathbf{BX}_{i,c,t+1}\, \gamma_2 + \mathbf{X}_{i,c,t-1}\, \gamma_3 + \varepsilon_{i,c,t}\,. \tag{5}$$

Bank links to the local economy. We argue that adding banks that are more *linked* to the local economy of the country they operate in would reduce information asymmetries for and about the firms and may help relax their financial constraints. For example, a bank having links with many firms (relationships), or exposure to larger firms, or clients from many cities, will be more skillful in screening and in assessing the flow of information regarding firms' risks. It could potentially facilitate the flow of information between its clients, playing an advisory role or otherwise helping clients to realize some form of synergies reflected in their performance. Adding domestic banks that do business with many clients may offer a larger information advantage about the country than adding any domestic bank; this might be true for foreign banks too, if they have a large presence in the country of the firm. Adding linked banks may also reduce firm financial constraints because such banks are able to spread risk more widely and thus reduce costs, but more so for foreign banks that, by definition, also have links to other countries. If true, a firm adding large and linked foreign banks may be able to tap into a larger funding portfolio, which includes foreign sources of funding, and may be able to reduce the costs of borrowing more than a firm adding any foreign bank. Still, more linked banks might be more exposed to idiosyncratic risks of larger clients or simply have difficulty to satisfy all of them and have to ration credit, at least in a single market in case of foreign banks (Claessens, 2017).

We measure the degree to which a firm i's banks are linked to local firms in each year t by i) aggregating the assets of each bank's other identified client firms $j \neq i$ in i's country c, ii) averaging these combined assets across all banks of firm i, separately for foreign and

domestic banks, to obtain:

$$\textbf{Bank links}_i = \frac{\sum_{b \in i} \text{bank}_{b,i} \times \textbf{Assets}_b}{\textbf{BR}_i}, \tag{6}$$

where we omit the subscripts c and t for brevity, the $\text{bank}_{b,i}$ is the indicator for if the bank b has the firm i as a client in year t, $\textbf{Assets}_b \equiv \sum_{j \in b, \neq i} Assets_j$ is the total assets of all bank b's client firms in country of firm i excluding i itself, and the number of bank relationships $\textbf{BR}_i \equiv \sum_{b \in i} \text{bank}_{b,i}$ of firm i. In the regressions we use the logarithmic transformation of the expression (6). As seen, changes in our bank links measure is driven by the changes in number of bank relationships as in specification (2) plus the combined economic size of each bank's non-financial clients, which in turn depend on the number and size of the other firms that the bank services.[24]

Bank specialization. To further investigate the information channel we consider changes in *bank specialization*. If a firm adds a bank relationship with a bank that is a specialist in the sector of the firm and has experience in dealing with similar firms, then the bank may grant credit more easily and provide additional sector-specific services by advising clients. This could materialise in growth of revenue and productivity. However, specialist banks are not necessarily able to spread risk more easily and thus may not offer cheaper credit.

To measure bank specialization from the perspective of firm i we i) determine in which 4-digit sector a firm's bank has most of its other clients within firm i's country (as measured by clients' total assets) and each year t, and ii) count the number of banks that have a relationships with firm i and specialize in the *same* sector in which firm i operates. As above, we do it separately for foreign and domestic banks, and if the firm does not have foreign (domestic) banks we set the corresponding measure to zero. In symbols:

$$\textbf{Bank specialization}_i = \sum_{i \in b} \Big[\text{Spec(s4)}_{b,i} \times \text{s4}_i \Big], \tag{7}$$

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[24]Alternatively, we base linkages not on assets but on a geographic measure: the count of cities of each bank's other identified client firms' addresses in i's country, as: $\textbf{Bank cities}_i = (\sum_{i \in b} \text{bank}_{b,i} \times \textbf{Cities}_b)/\textbf{BR}_i$, with $\textbf{Cities}_b \equiv \sum_{j \in b, \neq i} Cities_j$, the count the number of cities in which each bank b has client firms.

where the $\text{Spec}(\text{s4})_{b,i}$ is the indicator for if bank b has maximum of client's assets in 4-digit sector $s4$ (the banks "specializes" in sector $s4$) and the $s4_i$ is the indicator for if the 4-digit sector $s4$ is the main sector of operation of firm i according to Orbis.

4 Results

4.1 Changes in bank relationships

Table 3 reports the results from estimating equation (1) for changes in the number of bank relationships from $t-1$ to $t+1$ where we condition on controls that reflect the initial ownership structure and sector-year effects to proxy industry demand shocks.[25] We estimate the coefficient(s) γ_1, which captures the average change in banking relationships in acquired firms from the pre- to post-deal year, relative to the change in firms that were not acquired in the same country-4-digit industry-year over the same time period. The result in column 1 implies that firms that went through a majority acquisition did not see changes in banking relationships that are different from an average non-acquired firm. Looking at other controls, we see that target firms that are initially joint ventures or those with a controlling shareholder tend to add more banks, but we refrain from interpreting these findings further.

However, by splitting the Majority acquisition dummy into foreign and domestic indicators in column 2 we uncover clear heterogeneity according to who acquires, explaining the zero average correlation in the previous column. Firms with a large foreign buyer show a two-period cumulative increase in relationships, while those with a domestic buyer see a reduction of banking relationships. The point estimate on the Foreign acquisition is twice as large, although this is a rarer event.

In column 3, we further investigate if the associations differ by whether the *acquirer* had a prior relationship with the target by holding a minority stake. We split each of the two acquisition dummies into two by whether the ownership changes from no stake to

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[25]We focus on changes from $t-1$ to $t+1$ to exclude the possibility that we capture the addition of a bank that only appears in year t, which may be the bank externally advising on the acquisition deal. We report changes from $t-1$ to t in Appendix A3.

more than 50% stake (the New Foreign or New Domestic acquisition), or whether ownership changes from <50% stake to more than 50% stake (the Existing acquisition). The results are qualitatively similar to the grouped dummies in column 2: we find all foreign acquirers tend to increase bank relationships, while all domestic buyers reduce bank relationships. More formally, F-tests (reported at the bottom of column 3) show that the coefficients of the pairs of new and existing dummies (within foreign or domestic status) are insignificantly different from each other. We thus group new and existing acquirers in the rest of the analysis and focus on the split by foreign vs. domestic.

The results in column 2 imply that, if causal, a majority acquisition by a foreigner leads to a 6.1 percentage points increase in the number of banking relationships relative to a baseline sample of non-acquired firms. In contrast, a majority acquisition by a domestic buyer reduces the number by 3.2 percentage points. Referring to the statistics in column 1, panel B of Table 1, these results imply that after a Foreign acquisition, the mean change in bank relationships increases from a baseline mean of -0.037 for non-acquired firms to 0.024 and thus turns positive.

We interpret the results from this table as to imply that the internal capital market of foreign buyers does not replace bank relationships at the target level. Domestic majority owners consolidate banking relationships once they acquire control of the firms.[26]

So far, we examined the net changes in bank relationships. To dig deeper into heterogeneity by the type of banks, we split the net changes into foreign and domestic banks. Besides, we explore what drives the net changes by reporting the results for the number of added and dropped banks. Here we define the foreign status of a bank with respect to the host country of the target firm. For example, if a firm in Austria reports a bank relationship with Commerzbank AG, which Bankscope or Orbis Bank Focus lists as a German bank, we designate this relationship as foreign. The results are in Table 4 where in the first column we report a copy of the regression from column 2 of Table 3 for comparison. As before, we

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[26]The results in this table are robust to replacing the simple change in banking relationships by the log-difference and to clustering on country-sector. We find that foreign acquisition is associated with a 3-4 percent increase in bank relationships and domestic acquisition with a 2 percent decline.

control for whether or not targets and acquirers shared a foreign or domestic bank relationship in the year before the acquisition and the other control variables listed in Table 3 but suppress the coefficients for brevity. The variable *Banks added* is the number of *new* bank relationships that the firm reports to have added, where we compare t+1 to t-1 (two years). This count includes new relationships that replace existing relationships. The *Banks dropped* is, correspondingly, the number of bank relationships abandoned over the chosen period. In counting these changes, we keep track of the foreign status of the banks. Appendix A1 provides details on our firm-bank data and how we compute changes in bank relationships for a random Spanish firm observed in our data.[27]

Comparing columns 2 and 5 for the net change, split by the foreign status of the bank, we find that firms with *foreign* acquirers add, on the net, domestic banks (row one, column 5) but reduce the number of foreign banks (column 3), relative to the baseline of non-acquired firms. Looking within the net changes, columns 6 and 7 reveal that those foreign buyers do not actually add new domestic banks; rather, they are more likely to keep domestic banks, relative to the baseline of non-acquired firms. The firms with foreign acquirers keep relationships as they are, while the baseline reduces bank relationships.

In the second row, we find that *domestic* acquirers bring foreign banks (columns 2 and 3), contrary to the common belief that it is foreign firms that bring foreign banks. Comparing the magnitude of the coefficients in columns 2 and 5, we observe that domestic buyers instead replace domestic banks with fewer foreign banks, on the net, and often replace domestic banks by actively dropping and adding them (columns 6 and 7).

The results from this table provide a much more nuanced view of why banking relationships change following an acquisition. It seems that foreign buyers do not need the foreign capital access provided by foreign banks. Instead, they tap into domestic markets as they

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[27]As a general example, assume that a firm has banks A and B in year $t-1$ and B, C, D, E in year $t+1$. In this example, the firm replaced one bank (A), retained B, and added three new banks. Then, the number of bank relationships went from 2 to 4, a net change of +2. *Banks dropped* is 1, because the relationship with A was terminated. To distinguish by foreign status, we first split the banks into two groups (foreign and domestic) and count changes in a similar way within the two groups. For example, if A is foreign and all other banks are domestic the *Foreign banks added* is 0, the *Foreign banks dropped* is 1, and the *Foreign banks net change* is -1, the *Domestic banks added* is $+3$, the *Domestic banks dropped* is 0, and the *Domestic banks net change* is $+3$.

might seek local knowledge and services of domestic banks, a potential indication of difficulties to doing business in a different country. This result is consistent with the findings of several studies that stress the limited ability of foreign banks to replace domestic banks due to difficulties in lending to informationally opaque firms (Berger et al., 2001, Mian, 2006, Giannetti and Ongena, 2012). Domestic acquisitions are accompanied by much more churning of bank relationships than is the case with foreign acquisitions.[28] They seem less concerned about informational problems (maybe because of their superior knowledge of the local market), and thus they take a less cautious attitude towards actively changing banking relationships. Moreover, since the added banks have almost always an existing relationship with the acquirer (see Table 2), we find that domestic acquirers tend to replace banks with their own bank. Beck et al. (2018) provide evidence consistent with our interpretation showing that foreign banks have informational disadvantages in local markets while domestic banks exploit their relationships with firms from the same market.[29]

In unreported results, we verified that there is no significant relationship between a foreign buyer being new to the country (i.e., not already owning another firm in the target's country) and changes in bank relationships. Perhaps raising local capital is easier through domestic banks since distance matters in lending (Petersen and Rajan, 2002, Degryse and Ongena, 2005b) and foreign unfamiliar buyers prefer using local financing. Foreign acquirers, thus, make only minor changes to the portfolio of bank relationships. In contrast, non-acquired firms make some changes, and domestic acquirers make relatively substantial changes to the portfolio of bank relationships. Moreover, we find that in less-financially developed countries, where access to funding is limited and/or firms are more opaque, both types of acquires keep and increase domestic banks. Local knowledge is thus likely more important where capital markets are shallower and more so for foreign buyers for whom this effect dominates the

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[28]The results in this table are robust to dropping observations with the top and bottom 0.1 percentile changes in bank relationships (changes of -4 or less, changes of $+5$ or more), thereby also pruning adds and drops. They are also robust to dropping minority shareholder changes as reported in Table OA1.1 in the Online Appendix.

[29]Using a sample of firms that borrow from both domestic and foreign banks in the same month, they show that foreign banks are more likely to demand collateral, grant shorter maturity loans that are priced based on internal credit ratings, while domestic banks price their loans according to the length, depth, and breadth of their relationship with a firm.

effect for the average country.[30]

4.2 Real and financial effects of additional bank relationships

Does the fact that acquirers actively change the bank relationships of target firms benefit the firm's performance? In Table 5 we report the results from estimating equation (2) for the growth of various firm outcomes from t to $t+2$ versus the changes in the number of banking relationships from $t-1$ to $t+1$ in the matched sample of firms. Notice that we do not include the acquisition dummy ΔBR in this regression but match exactly on the (foreign or domestic) acquisition at the time t or earlier and other variables as discussed in Section 3.2. Our matching method is very conservative and intends to control for the demand for banking services at the firm level and other firm characteristics that might drive changes in bank relationships. With that, we interpret the coefficients to change in foreign and domestic banking relationships as the causal effect of the change in the supply of relational bank services on firm outcomes. We condition on the lagged growth and log-level of employment and total assets to wash out the remaining differences between firms that changed bank relationships (the treated) and the other firms (the control group), and cluster standard errors at the country-sector-year level.

Panel A of the table looks at major categories of firm assets and liabilities. We report the coefficients for fixed assets throughout because the changes in this item represent (gross) investment in capacity; the results for total assets are qualitatively similar in all our regressions. As seen in column 1, adding domestic banks leads to an increase in investment in fixed capital over two years and has an expansionary effect on current assets (column 2). The change does not materialize in higher working capital (column 3), which indicates how much capital is used by day to day activities.[31] Looking at the liability side in columns 4-7

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[30]See Online Appendix Section OA3. We also find that in less-financially developed countries both types of buyers reduce foreign banks, perhaps because in such countries access to foreign finance is comparatively less costly trough internal capital markets than trough the (relatively fewer) locally present foreign banks.

[31]The current assets include inventories (raw materials, work in progress, finished goods), trade receivables (from clients and customers only), and other current assets such as receivables from other sources (taxes, group companies), and liquid cash. Working capital is equal to inventories and receivables net of operating payables.

we do not detect the evidence that the growth of fixed assets is supported by long-term debt or loans. However, firms adding domestic banks tend to receive more trade credit, which is another source of short-term funding especially for financially constrained firms (Klapper et al., 2011, among others). In contrast, adding foreign banks does not alter either side of the balance sheet compared to the firms without changes in bank relationships.

The benefits of adding foreign banks appear in Panel B, which looks at cost of financing and operating efficiency. Firms adding more foreign banks see a decline in total interest expenditure (column 1) and a lower interest rate (column 2), computed as interest expenditures over total debt. In contrast, adding more domestic banks increases interest expenditure which, in turn, significantly worsens firm's ability to cover the interest expenditure with earnings (column 3). Increasing fixed assets and larger trade credit thus comes at the cost of more interest payments. Looking at operating efficiency in columns 4 and 5 we also find that adding foreign banks significantly reduces labor cost per employee (a proxy for average wage rate). We come back to this point in Section 4.4. The profitability of sales (column 5) or assets (unreported) is not affected by changes in bank relationships.

In sum, domestic banks help to expand trade credit and increase investment, while foreign banks mainly reduce the cost of financing. Combined with the previous section, our preliminary conclusion is that domestic banks may offer an investment-related local information advantage that foreign acquirers seek for their target firms. Domestic acquirers face less information asymmetry and thus do not need domestic banks. Instead, their acquisitions benefit more from the lower cost of finance offered by foreign banks.

4.3 Firm and bank heterogeneity

Bank relationships and financially constrained firms

So far we found that foreign acquirers tend to keep domestic banks and that adding domestic banks (conditional on being acquired or not as per our matching estimator) leads to an increase in investment and expansion of trade credit. Domestic acquirers tend to add foreign banks that, in turn, reduce the cost of financing. Do these benefits accrue to all firms or only

to financially constrained firms that rely more on banks for their financing? In Table 6 we report the results of estimating equation (4) with an index of firm-level financial constraints (see Section 3.3). We find that all results of Table 5 are indeed driven by the firms that are financially constrained. This is encouraging because it is the financially constrained firms that need more or cheaper financing the most, and our results suggest that an additional bank relationship achieves this goal. If an acquisition event makes it possible to add a bank relationship, then cheaper financing is one channel through which target firms can benefit from being acquired. The fact that Foreign acquirers add domestic banks (or not drop them), and the fact that adding banks has real benefits for constrained firms only (conditional on acquisition), suggests that parent firms do not solely rely on internal capital markets to relax financial constraints. Bank relationships thus have value over and above the internal capital markets or increased creditworthiness that larger firms offer to their subsidiaries.

Relationships with linked and specialized banks

To further strengthen the economic interpretation of our findings in terms of the channels outlined in Section 3.3, we exploit the richness of our dataset and look at some characteristics of the acquired banks. First we account for the extent to which foreign and domestic banks have an information advantage by having a better grasp on local conditions, broadly defined, and how they can spread risk among clients and locations, and thus reduce costs. We define a "linked bank" as the bank that i) services a larger share of the real economy as measured by the combined asset size of clients or ii) has a larger geographic network in the firm's country as measured by the location of clients. In addition, foreign banks have connections to multiple countries and may thus offer more access to funding.[32]

We estimate specification (5) with the measure of bank linkages representing their total client asset base (as measured by the aggregate assets of the bank clients, covered by our data, in the country of a given firm). If a firm adds relationships with banks who in turn, on average, have a larger total clients asset base then the variable "Foreign (Domestic) Bank

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[32]Because Foreign banks may have their headquarter in another country than the countries in our sample, such as in the US, we do not directly measure the foreign client base of foreign banks.

Links" would go up. Table 7 reports the results, following the structure of the previous tables. In Panel A we see that having more foreign banks, keeping linkages constant, results in more loans, long-term and total debt (columns 4–6), and on the asset side in a boost in working capital (column 3). However, when a firms changes its mix of bank relationships towards more linked foreign banks, while keeping the number of relationships constant, then debts and working capital are reduced. More importantly, the earlier finding of a reduction in the cost of borrowing (average interest rate paid) by foreign banks (see Table 5) is driven by having more linked banks, as Panel B shows. For more domestic banks, we again detect the previously seen higher growth of fixed and current assets and trade credit (columns 1,2, and 7), as well as a new result of somewhat higher total debt in column (4). Column 1 shows that the positive effect of adding domestic banks on fixed assets of Table 5 is mostly driven by changing the mix of domestic bank relationships towards linked banks.[33] If connectivity helps to grow investments, then this is consistent with connectivity of domestic banks capturing local knowledge. The connectivity of foreign banks is more important for banks being able to spread risk and lower the cost of borrowing.

We further attempt to 'unbundle' the effect of changes in the number of bank relationships by conditioning on a measure of bank specialization, which we define by the bank's familiarity with the industrial sector of the client-firm. As we argue in Section 3.3, specialist-banks may assess firms' business models better, monitor the firm more effectively, and as a result be willing to fund it at more favorable terms; at the same time they can serve as a conduit of productivity spillovers between multiple clients in the same sector. For the variable Specialist Banks we count the number of banks of a given firm whose other clients mostly operate in the same narrow 4-digit sector as the firm. If a firm adds more (foreign or domestic) banks which are 'knowledgeable' in its sector of operation then Specialist Banks goes up. Table 8 shows that most of the results for key outcomes affected by changes in bank relationships that we saw before remain unaltered by adding the measure of bank specialization. Consistent

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[33]Table OA1.2 in the Online Appendix shows that these results are robust to an alternative definition of bank links based on geography: the total number of cities in the firm's country where the banks' clients are present.

with our interpretation that domestic banks are valuable for their local knowledge, having more domestic specialized banks is conducive to fixed asset investments but the coefficient in column 1 is only significant at 15 percent. This focus on investment somewhat hurts ROS (column 7).[34]

Introducing bank heterogeneity opens several new dimensions on how changes in bank relationships affect client-firms. We see that foreign banks might not necessarily have 'deeper pockets' because adding them is associated with lower credit and working capital investments. They could still benefit the firm because of the previously seen reduction in the cost of financing—in particular, for financially constrained firms. Having more foreign banks of a constant level of links is conducive to access to more loans for operating purposes and more debt than what firms without changes in bank relationships would have, leading to an increase in profitability. Adding domestic banks who are linked or specialists in a firm's sector does not alter the firm's balance sheet much, but helps investment in fixed assets. Introducing heterogeneity in bank characteristics did not alter our previous finding that *changing* banks promotes firm financing and that these changes have other positive effects on firm operations (trade credit, profitability, etc.), depending on the nationality of the added banks.

4.4 Extension: additional real firm effects

In all previous analysis we focused on testing the hypotheses about the role of changes in bank relationships for financing of the firm, the costs of financing, and commensurate changes in firm investment and profitability. After all, these firm outcomes are usually thought of when we discuss the role of banks in the economy. We extend our analysis by considering several other real outcomes such as employment, wage rate, output and improvements in labor productivity. These outcomes may be affected by changes in bank relationships through similar theoretical mechanisms we discussed before, but the potency of the response might

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[34]We confirm these results with an alternative measure of specialization where for a firm i in each year we i) determine the Herfindahl–Hirschman index over the bank's clients (in our data) in i's country and ii) take the maximum of the H-H index across all banks of firm i, separately for foreign and domestic banks.

be different form what we saw with the balance sheet items or profitability ratios. In Table 9 we present the results from the most inclusive specification, where we use two measures of bank links (based on the assets of banks' other clients reported in the previous tables, in Panel A, and based on banks' geographic presence, for robustness, in Panel B) and a measure of bank specialization based on the commonality of the sector of operation between banks' clients as in Table 8.

Column 1–2 and 5–6 show that adding foreign banks has a strong employment-promoting effect and boosts wages (wage bill per worker), although this not the case when changing the mix of foreign banks towards linked banks. The latter does not hurt total output (measured by operating revenue; column 3 and 7), relative to comparison group, and, as the result, improves labor productivity (revenue to employment; column 4–5 and 9–10), especially when more links implies a foreign bank's presence in many cities in the host country (Panel B). Unlike in Table 8 we see an important role of bank specialization, but only of domestic banks. Not only do specialist domestic banks help investment in fixed assets, they also help output grow faster and also productivity in per worker terms significantly improves.

5   Summary of results and discussion

Using a comprehensive database on firm-bank relationships, the dynamics of firm ownership, several bank characteristics, and firm-level financial outcomes from 23 European countries over 2008–2015, we investigate empirically what happens to the existing firm-bank relationships after a corporate acquisition, and whether the changes in bank relationships have subsequent effects on the firm's balance sheet, cost of financing, and operations.

First, we use the majority acquisitions of firms by foreign or domestic acquirers as a shock to firm-bank relationships and find that domestic acquirers, and not the foreign ones, are much more active in changing banks. These results cast doubt on the conventional view in literature, which talks about foreigners bringing "new money." Typically, the expectation would be that the foreign acquisitions would result in better access to finance, such as via internal capital markets. The finding that foreign acquirers tend to keep domestic banks

without adding new foreign banks suggests that internal capital markets are not sufficient to satisfy the funding needs of firms. Our results are consistent with an alternative explanation, emphasizing the asymmetric information on the part of new acquirers concerning local markets (in the case of foreign acquirers) or targets (in the case of domestic acquirers). It appears that foreign acquirers are less likely to bring new bank relationships, not because they do not have their own banks but because they prefer to take advantage of the existing target-bank relationships and, therefore, do not want to break the existing ties. At the same time, new domestic owners seem to actively re-evaluate existing and seek new bank relationships, including adding foreign bank relationships. To uncover the reasons for this, we look closer at firm-level outcomes and examine both firm and bank heterogeneity.

By looking at the effect of changes in bank relationships on firm outcomes we follow the call of Amiti and Weinstein (2018) to extend the existing voluminous literature, in the tradition of Khwaja and Mian (2008), on the effects of shocks to loan supply by the existing (static) banks. Potentially, we can detect evidence of a richer set of economic mechanisms of how changes in supply of banking services due to changes in bank relationships could affect firms. To this end, we use a difference-in-difference matching estimator and control for credit demand at the firm level to demonstrate that the nationality of the added banks relative to the firm is an important factor in determining what aspect of firm operations is affected. We find that an increase in the number of foreign banks promotes lending to firms to fund day-to-day operations (working capital) and enables firms to grow the workforce and pay more generous wages. Meanwhile, adding domestic banks promotes investment and trade credit but increases interest payments. These effects are concentrated in firms that are credit constrained.

Exploiting the heterogeneity of bank characteristics, beyond the nationality, we provide a more nuanced view on the channels through which new foreign or domestic banks may affect local firms. We find that foreign banks that service a larger share of the real economy or have a vast geographic network of clients—which we call "linked banks"—reduce the cost of financing. But likely competition for funds among the linked bank's clients depresses

the lending for client-firms, and this forces firms to cut investment in working capital and employment. This is consistent with our findings from the first part of the analysis that questions the view of the "deep pockets" of foreign lenders and points to the possibility of the need to ration credit between the numerous clients of foreign linked banks. Instead, we see that these banks push for more efficiency improvements by having the wage rate cut and cut the lending rate, which promotes revenue productivity. In addition, we document some operating synergies from adding domestic "specialised banks" with expertise in the firm's sector of operation. Such banks help firms to grow assets and sales with the same employment base, naturally benefiting productivity.

Taking our results together, we conclude that domestic acquirers tend to add foreign banks and such banks reduce the cost of financing for their target, especially if they are linked. Foreign acquirers tend to keep domestic banks and such banks help its targets to invest in fixed assets, grow sales, and improve productivity in a market where the local bank potentially has more knowledge than the foreign parent firm, especially if these are linked and specialist banks. Because the benefits of adding banks are concentrated in credit-constrained firms our results suggest that changes in bank relationships alleviate firm credit constraints.

Broadly, our results point to the importance of managing bank relationships as a part of the broader firm financing policy. The result that foreign banks that are linked and thus well-established in host countries do not readily extend more credit to their new clients might point to continued tight conditions in global capital markets, perhaps due to more stringent regulations and foreign bank retrenchment in the aftermath of the Global Financial Crisis (Claessens, 2017, Buch and Goldberg, 2020). Conversely, the recent literature raises a concern that access to new or cheaper bank funding might create excess capacity and keep operating those firms that should otherwise fail (the so-called "zombie firms"), as argued by Acharya et al. (2020). Our findings that new bank relationships primarily benefit credit-constrained firms and lead to a number of efficiency improvements in firm operations (lower wage rate, higher profitability of sales and productivity) lets us believe that the changes in bank relationships represent positive changes. The evidence that the channels by which

new banks affect firms differ depending on bank nationality, client and geographic networks, and bank specialization invites more work to understand the role of these and other bank characteristics for corporate outcomes.

References

Acharya, V.V., Crosignani, M., Eisert, T., Eufinger, C., 2020. Zombie credit and (dis-) inflation: Evidence from Europe. Working Paper 27158. National Bureau of Economic Research.

Acharya, V.V., Eisert, T., Eufinger, C., Hirsch, C., 2018. Real effects of the sovereign debt crisis in Europe: Evidence from syndicated loans. Review of Financial Studies 31, 2855–2896.

Acharya, V.V., Eisert, T., Eufinger, C., Hirsch, C., 2019. Whatever it takes: The real effects of unconventional monetary policy. Review of Financial Studies 32, 3366–3411.

Adrian, T., Colla, P., Shin, H.S., 2012. Which financial frictions? Parsing the evidence from the financial crisis of 2007 to 2009.

Amiti, M., Weinstein, D.E., 2011. Exports and financial shocks. Quarterly Journal of Economics 126, 1841–1877.

Amiti, M., Weinstein, D.E., 2018. How much do idiosyncratic bank shocks affect investment? Evidence from matched bank-firm loan data. Journal of Political Economy 126, 525–587.

Andrade, G., Mitchell, M., Stafford, E., 2001. New evidence and perspectives on mergers. Journal of Economic Perspectives 15, 103–120.

Angelini, P., Salvo, R.D., Ferri, G., 1998. Availability and the cost of credit for small business: Customer relationships and credit cooperatives. Journal of Banking and Finance 22, 925–954.

Beck, T., Ioannidou, V., Schafer, L., 2018. Foreigners vs. natives: Bank lending technologies and loan pricing. Management Science 64, 3792–3820.

Bena, J., Li, K., 2014. Corporate innovations and mergers and acquisitions. Journal of Finance 69, 1923–1960.

Berger, A.N., Klapper, L.F., Udell, G.F., 2001. The ability of banks to lend to informationally opaque small businesses. Journal of Banking and Finance 25, 2127–2167.

Berger, A.N., Udell, G.F., 1995. Relationship lending and lines of credit in small firm finance. The Journal of Business 68, 351–381.

Berger, A.N., Udell, G.F., 2002. Small business credit availability and relationship lending: The importance of bank organisational structure. The Economic Journal 112, F32–F53.

Betton, S., Eckbo, B.E., Thorburn, K.S., 2008. Chapter 15 - Corporate Takeovers, in: Eckbo, B.E. (Ed.), Handbook of Empirical Corporate Finance. Elsevier, San Diego. Handbooks in Finance, pp. 291 – 429.

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

Bhattacharya, S., Chiesa, G., 1995. Proprietary information, financial intermediation, and research incentives. Journal of Financial Intermediation 4, 328–357.

Bolton, P., Schrafstein, D., 1996. Optimal debt structure and the number of creditors. Journal of Political Economy 104, 1–25.

Boot, A.W., 2000. Relationship banking: What do we know? Journal of Financial Intermediation 9, 7–25.

Boot, A.W.A., Thakor, A.V., 1994. Moral hazard and secured lending in an infinitely repeated credit market game. International Economic Review 35, 899–920.

Buch, C.M., Goldberg, L.S., 2020. Global banking: Toward an assessment of benefits and costs. Annual Review of Financial Economics 12, 141–175.

Buchuk, D., Larrain, B., Munoz, F., Urzua I., F., 2014. The internal capital markets of business groups: Evidence from intra-group loans. Journal of Financial Economics 112, 190 – 212.

Chodorow-Reich, G., 2014. The employment effects of credit market disruptions: Firm-level evidence from the 2008-09 financial crisis. Quarterly Journal of Economics 129.

Claessens, S., 2017. Global banking: Recent developments and insights from research. Review of Finance 21, 1513–1555.

Degryse, H., De Jonghe, O., Jakovljevic, S., Mulier, K., Schepens, G., 2019. Identifying credit supply shocks with bank-firm data: Methods and applications. Journal of Financial Intermediation 40, 100813.

Degryse, H., Ioannidou, V., von Schedvin, E., 2016. On the nonexclusivity of loan contracts: An empirical investigation. Management Science 62, 3510–3533.

Degryse, H., Ongena, S., 2001. Bank relationships and firm profitability. Financial Management 30, 9–34.

Degryse, H., Ongena, S., 2005b. Distance, lending relationship and competition. Journal of Finance 60, 231–266.

Diamond, D.W., 1984. Financial intermediation and delegated monitoring. Review of Economic Studies 51, 393–414.

Diamond, D.W., 1991. Monitoring and reputation: The choice between bank loans and directly placed debt. Journal of Political Economy 99, 689–721.

Erel, I., Jang, Y., Weisbach, M.S., 2015. Do acquisitions relieve target firms' financial constraints? Journal of Finance 70, 289–328.

Farinha, L.A., Santos, J.A.C., 2002. Switching from single to multiple bank lending relationships: Determinants and implications. Journal of Financial Intermediation 11, 124–151.

Ferrando, A., Popov, A., Udell, G.F., 2019. Do SMEs benefit from unconventional monetary policy and how? Microevidence from the Eurozone. Journal of Money, Credit and Banking 51, 895–928.

Fons-Rosen, C., Kalemli-Ozcan, S., Sorensen, B.E., Villegas-Sanchez, C., Volosovych, V., 2021. Quantifying productivity gains from foreign investment. Journal of International Economics 131, 103456.

Gan, J., 2007. The real effects of asset market bubbles: Loan- and firm-level evidence of a lending channel. Review of Financial Studies 20, 1941–1973.

Giannetti, M., Ongena, S., 2012. Lending by example: Direct and indirect effects of foreign banks in emerging markets. Journal of International Economics 86, 167 – 180.

Gopalan, R., Udell, G.F., Yerramilli, V., 2011. Why do firms form new banking relationships? Journal of Financial and Quantitative Analysis 46, 1335–1365.

Greenbaum, S.I., Kanatas, G., Venezia, I., 1989. Equilibrium loan pricing under the bank-client relationship. Journal of Banking and Finance 13, 221–235.

Greenstone, M., Mas, A., Nguyen, H.L., 2020. Do credit market shocks affect the real economy? Quasi-experimental evidence from the Great Recession and "normal" economic times. American Economic Journal: Economic Policy 12, 200–225.

Guadalupe, M., Kuzmina, O., Thomas, C., 2012. Innovation and foreign ownership. American Economic Review 102, 3594–3627.

Harhoff, D., Korting, T., 1998. Lending relationships in germany – empirical evidence from survey data. Journal of Banking and Finance 22, 1317–1353.

Hoberg, G., Phillips, G., 2010. Product market synergies and competition in mergers and acquisitions: A text-based analysis. Review of Financial Studies 23, 3773–3811.

Hubbard, R., Kuttner, K.N., Palia, D.N., 2002. Are there bank effects in borrowers' costs of funds? Evidence from a matched sample of borrowers and banks. Journal of Business 75, 559–581.

Iacus, S.M., King, G., Porro, G., 2011. Multivariate matching methods that are monotonic imbalance bounding. Journal of the American Statistical Association 106, 345–361.

Ioannidou, V., Ongena, S., 2010. Time for a change: Loan conditions and bank behavior when firms switch banks. Journal of Finance 65, 1847–1877.

Ivashina, V., Kovner, A., 2011. The private equity advantage: Leveraged buyout firms and relationship banking. Review of Financial Studies 24, 2462–2498.

Javorcik, B., Poelhekke, S., 2017. Former foreign affiliates: Cast out and outperformed? Journal of the European Economic Association 15, 501–539.

Javorcik, B.S., 2004. Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. American Economic Review 94, 605–627.

Jimenez, G., Ongena, S., Peydro, J.L., Saurina, J., 2012. Credit supply and monetary policy: Identifying the bank balance-sheet channel with loan applications. American Economic Review 102, 2301–26.

Jimenez, G., Ongena, S., Peydro, J.L., Saurina, J., 2014. Hazardous times for monetary policy: What do twenty-three million bank loans say about the effects of monetary policy on credit risk-taking? Econometrica 82, 463–505.

Kalemli-Ozcan, S., Laeven, L., Moreno, D., 2019. Debt overhang, rollover risk, and corporate investment: Evidence from the European crisis. Working Paper Series 2241. European Central Bank.

Kalemli-Ozcan, S., Sorensen, B., Villegas-Sanchez, C., Volosovych, V., Yesiltas, S., 2015. How to construct nationally representative firm level data from the ORBIS global database. NBER Working Papers 21558. National Bureau of Economic Research, Inc.

Kalemli-Ozcan, S., Sorensen, B., Volosovych, V., 2014. Deep financial integration and volatility. Journal of the European Economic Association 12, 1558–1585.

Kashyap, A.K., Stein, J.C., Wilcox, D.W., 1993. Monetary policy and credit conditions: Evidence from the composition of external finance. American Economic Review 83, 78–98.

Khwaja, A.I., Mian, A., 2008. Tracing the impact of bank liquidity shocks: Evidence from an emerging market. American Economic Review 98, 1413–42.

Klapper, L., Laeven, L., Rajan, R., 2011. Trade credit contracts. The Review of Financial Studies 25, 838–867.

Klein, M.W., Peek, J., Rosengren, E.S., 2002. Troubled banks, impaired foreign direct investment: The role of relative access to credit. American Economic Review 92, 664–682.

Kroszner, R.S., Laeven, L., Klingebiel, D., 2007. Banking crises, financial dependence, and growth. Journal of Financial Economics 84, 187–228.

Kysucky, V., Norden, L., 2016. The benefits of relationship lending in a cross-country context: A meta-analysis. Management Science 62, 90–110.

Larrain, B., Sertsios, G., Urzua I, F., 2018. The effects of losing a business group affiliation. Review of Financial Studies 32, 3036–3074.

Manova, K., Wei, S.J., Zhang, Z., 2015. Firm exports and multinational activity under credit constraints. Review of Economics and Statistics 97, 574–588.

Martinez Peria, M.S., Mody, A., 2004. How foreign participation and market concentration impact bank spreads: Evidence from latin america. Journal of Money, Credit and Banking 36, 511–537.

Mian, A., 2006. Distance constraints: The limits of foreign lending in poor economies. Journal of Finance 61, 1465–1505.

Ongena, S., Smith, D.C., 2000a. Bank relationships: A review, in: Harker, P., Zenios, S. (Eds.), Performance of Financial Institutions: Efficiency, Innovation, Regulations. Cambridge University Press.

Ongena, S., Smith, D.C., 2000b. What determines the number of bank relationships? Cross-country evidence. Journal of Financial Intermediation 9, 26–56.

Ongena, S., Smith, D.C., 2001. The duration of bank relationships. Journal of Financial Economics 61, 449 – 475.

Paravisini, D., 2008. Local bank financial constraints and firm access to external finance. Journal of Finance 63, 2161–2193.

Paravisini, D., Rappoport, V., Schnabl, P., 2015. Specialization in bank lending: Evidence from exporting firms. Working Paper 21800. National Bureau of Economic Research.

Peek, J., Rosengren, E.S., 1997. The international transmission of financial shocks: The case of Japan. American Economic Review 87, 495–505.

Peek, J., Rosengren, E.S., 2000. Collateral damage: Effects of the Japanese bank crisis on real activity in the United States. American Economic Review 90, 30–45.

Petersen, M.A., Rajan, R.G., 1994. The benefits of lending relationships: Evidence from small business data. Journal of Finance 49, 3–37.

Petersen, M.A., Rajan, R.G., 2002. Does distance still matter? The information revolution in small business lending. Journal of Finance 57, 2533–2570.

Rajan, R., 1992. Insiders and outsiders: The choice between informed and arm's length debt. Journal of Finance 47, 1367–1400.

Santos, J.A.C., 2010. Bank corporate loan pricing following the subprime crisis. The Review of Financial Studies 24, 1916–1943.

Sharpe, S.A., 1990. Asymmetric information, bank lending, and implicit contracts: A stylized model of customer relationships. The Journal of Finance 45, 1069–1087.

Stein, J.C., 1997. Internal capital markets and the competition for corporate resources. Journal of Finance 52, 111–133.

Von Thadden, E., 1995. Long-term contracts, short-term investment and monitoring. Review of Economic Studies 62, 557–575.

Von Thadden, E., 2004. Asymmetric information, bank lending, and implicit contracts: The winner's curse. Financial Research Letters 1, 11–23.

Whited, T.M., Wu, G., 2006. Financial constraints risk. Review of Financial Studies 19, 531–559.

Tables

Table 1: Bank relationships: Descriptive statistics

	(1)	(2)	(3)	(4)	(5)	(6)
	Group 1		Group 2		Group 3	
	Never ownership change (0%)		Ever minority ownership change ($< 50\%$)		Ever majority acquisition ($\geq 50\%$)	
Variable	mean	N	mean	N	mean	N
Panel A: Number of bank relationships						
Bank relationships	1.610	422,352	1.635	626,302	1.699	64,467
Foreign bank relationships	0.057	22,972	0.058	34,732	0.057	3,505
Domestic bank relationships	1.553	412,002	1.576	610,936	1.641	62,697
Panel B: Changes of banks relationships						
Δ bank relationships, t-1 to t+1	-0.037	56,005	-0.028	84,394	0.014	9,837
Δ foreign bank relationships, t-1 to t+1	0.016	18,453	0.015	27,853	0.018	2,773
Δ domestic bank relationships, t-1 to t+1	-0.054	58,857	-0.043	88,522	-0.005	10,332
Panel C: Number of banks added and dropped						
Banks added, t-1 to t+1	0.231	73,572	0.239	111,130	0.289	12,786
Foreign banks added, t-1 to t+1	0.034	14,064	0.034	20,548	0.034	2,115
Domestic banks added, t-1 to t+1	0.197	65,585	0.205	99,822	0.255	11,753
Banks dropped, t-1 to t+1	0.275	79,989	0.275	119,626	0.285	12,785
Foreign banks dropped, t-1 to t+1	0.018	7,413	0.019	11,354	0.016	969
Domestic banks dropped, t-1 to t+1	0.257	76,966	0.256	114,586	0.269	12,336

Note: This table shows summary statistics for firm-year observations where we can track bank relationships for at least five years and two-period changes in bank relationships (from t-1 to t+1) for at least three observations per firm. In columns 2, 4, and 6 the events statistics do not add up because we do not observe the nationality of each bank. Also note that the change in bank relationships (Panel B) is the sum of changes in foreign, domestic, and missing nationality bank relationships.

Table 2: Decomposing added banks

Panel A: Majority acquisitions (Group 3)	...where 1 or more bank was added	missing
Nr Foreign banks added, t-1 to t+1	490	0
... of which: new to country, t-1 to t+1	2	0
... of which: new to acquirer, t-1 to t+1	8	1
Nr Domestic banks added, t-1 to t+1	1,418	0
... of which: new to acquirer, t-1 to t+1	52	658

Panel B: Minority ownership change (Group 2)	...where 1 or more bank was added	missing
Nr Foreign banks added, t-1 to t+1	20,015	0
... of which: new to country, t-1 to t+1	238	0
... of which: new to acquirer, t-1 to t+1	6	28

Note: This table shows summary statistics for the regression sample of Table 4. The second column counts the number of observations where one or more banks were added of the type listed in the first column. *Missing data* implies that we do not have sufficient information, such as when the nationality of the bank is unknown, or if we do not know the bank of the acquirer, such as when the acquirer is an individual.

Table 3: Acquisitions and change in bank relationships

	(1)	(2)	(3)
Dependent variable	Changes in number of bank relationships, t-1 to t+1		
Majority acquisition	-0.000		
	(0.012)		
Foreign acquisition		0.061***	
		(0.017)	
Domestic acquisition		-0.032**	
		(0.014)	
New Foreign acquisition			0.057***
			(0.016)
Existing Foreign acquisition			0.074***
			(0.029)
New Domestic acquisition			-0.037*
			(0.019)
Existing Domestic acquisition			-0.027*
			(0.017)
Majority foreign owned (>50%), t-1	-0.018	-0.004	-0.004
	(0.013)	(0.013)	(0.013)
Main owner controls >50%, t-1	0.025*	0.025	0.024
	(0.015)	(0.015)	(0.015)
Joint venture (50-50 split), t-1	0.051***	0.050***	0.053***
	(0.013)	(0.013)	(0.014)
Number of shareholders, t-1	-0.001	0.000	-0.000
	(0.006)	(0.006)	(0.006)
Shared bank, t-1	-0.035	-0.002	-0.003
	(0.031)	(0.032)	(0.031)
Obs.	652,477	652,477	652,477
R^2	0.530	0.530	0.530
Firm & 4 dgt Industry-Year FE	✓	✓	✓
SE cluster country-sector-year	✓	✓	✓
Foreign: F-test p.			0.5103
Domestic: F-test p.			0.6823

Note: This table shows OLS regressions of the effect of acquisition on changes in number of bank relationships at various time intervals relative to acquisition year. t refers to the acquisition year, $t-1$ is the year before the acquisition, and $t+1$ is the year following the acquisition. Robust standard errors (clustered by country-sector-year) in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Table A2.1 contains summary statistics. See Section 3 for variable definitions and sources.

Table 4: Acquisitions and change in foreign and domestic bank relationships

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	Changes in Bank relationships, t-1 to t+1						
Type of banks	All banks	*Foreign* banks			*Domestic* banks		
Direction of change	Net change	Net change	Added	Dropped	Net change	Added	Dropped
Foreign acquisition	0.061***	-0.024***	-0.026***	-0.003	0.085***	-0.019	-0.100***
	(0.017)	(0.006)	(0.005)	(0.004)	(0.017)	(0.014)	(0.018)
Domestic acquisition	-0.032**	0.032***	0.038***	0.006**	-0.064***	0.069***	0.138***
	(0.014)	(0.005)	(0.005)	(0.002)	(0.014)	(0.013)	(0.015)
Obs.	652,477	652,477	652,477	652,477	652,477	652,477	652,477
R^2	0.530	0.514	0.510	0.593	0.520	0.585	0.564
Standard controls	✓	✓	✓	✓	✓	✓	✓
Firm & 4 dgt Industry-Year FE	✓	✓	✓	✓	✓	✓	✓
SE cluster country-sector-year	✓	✓	✓	✓	✓	✓	✓

Note: This table shows OLS regressions of the effect of acquisition on changes in number of bank relationships, by type of the bank (foreign or domestic), from the year before the acquisition $t-1$ the year following the acquisition $t+1$. Foreign bank is defined as the bank with headquarters outside of target own country. Standard controls, listed in Table 3, are included but the coefficients are not reported for space considerations. Robust standard errors (clustered by country-sector-year) in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Table A2.1 contains summary statistics. See Section 3 for variable definitions and sources.

Table 5: Effects of changes in bank relationships on firms: Balance sheet, financing, efficiency. All firms in matched sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:				Growth of firm outcomes, t to t+2			
				Panel A: Selected Assets and Liabilities			
	Assets			Liabilities			
	Fixed Assets		Working Capital	Total Debt			Trade Credit
		Current Assets			L-Term Debt	Loans	
ΔForeign BR, t-1 to t+1	-0.064 (0.055)	0.028 (0.029)	0.077 (0.057)	0.042 (0.071)	0.044 (0.119)	-0.095 (0.104)	-0.031 (0.075)
ΔDomestic BR, t-1 to t+1	0.044** (0.018)	0.026** (0.012)	0.022 (0.020)	0.047 (0.033)	0.052 (0.044)	-0.052 (0.040)	0.064** (0.025)
Obs.	1,831	1,842	1,462	1,079	752	757	1,624
R^2	0.025	0.014	0.009	0.017	0.006	0.024	0.026

	Panel B: Cost of Financing and Operating Efficiency				
	Cost of Financing			Operating Efficiency	
	Interest Paid	Interest Rate	Interest Coverage	Wage Rate	ROS
ΔForeign BR, t-1 to t+1	-0.504*** (0.183)	-0.034** (0.016)	0.596 (3.287)	-1.488*** (0.556)	0.003 (0.004)
ΔDomestic BR, t-1 to t+1	0.106*** (0.034)	-0.003 (0.009)	-1.620* (0.904)	-0.367 (0.341)	0.001 (0.002)
Obs.	1,027	1,557	1,102	971	1,750
R^2	0.038	0.007	0.007	0.014	0.012

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Growth Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
log Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
S.E. clustered cntr.-sector-year	✓	✓	✓	✓	✓	✓	✓

Note: This table shows OLS regressions of the effect of the net changes in foreign and domestic bank relationships(Δ For. BR and Δ Dom. BR) on financial variables in the matched sample of firms that experienced a change in number of bank relationships (treated) and firms without such change (controls). Changes in bank relationships are computed over 2-year interval from year, t-1 to t+1. All regressions include the first lag of level and growth of the number of employees and of operating revenue. Interest coverage is defined as EBITDA to interest paid. The Wage Rate is total wage bill (in '000s $ 2005 base) over the number of employees. The ROS is return on sales, defined as EBIT to operating revenue. Growth rates of x_t are computed as log-difference for variables in monetary units ($ 2005 base) and simple difference for the ratios. Matching is done by the coarsened exact matching (CEM) methodology due to Iacus et al. (2011), using i) the first lags of operating revenue ($ 2005 base), the number of employees, the growth of operating revenue, the growth of the number of employees, the second lag of operating revenue, and ii) the lags of the number of domestic foreign bank relationships, the number of foreign bank relationships, of the indicators of whether the firm was majority foreign-owned, domestic acquisition dummy, foreign acquisition dummy, and the indicator consisting of the interaction of fixed effects at the level of country, two-digit industry, city of the firm's address, total assets deciles for size, and years to control for local credit demand effects. The details of the CEM methodology are described in Section 3.2. Robust standard errors (clustered by country-1-digit sector-year) in parenthesis: *** p < 0.01, ** p < 0.05, * p < 0.10, and $^+$p < 0.15.

Table 6: Effects of changes in bank relationships on financially-constrained and unconstrained firms. Matched sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Growth of firm outcomes, t to t+2						

Panel A: Selected Assets and Liabilities

	Assets			Liabilities			
	Fixed Assets		Working Capital	Total Debt			Trade Credit
		Current Assets			L-Term Debt	Loans	
Constrained$^{\text{WW}}$ × ΔFor.BR	-0.073 (0.061)	0.025 (0.033)	0.062 (0.062)	0.021 (0.076)	0.053 (0.115)	-0.134 (0.116)	-0.042 (0.088)
Constrained$^{\text{WW}}$ × ΔDom.BR	0.045** (0.020)	0.024* (0.012)	0.019 (0.023)	0.042 (0.034)	0.016 (0.041)	-0.057 (0.044)	0.064** (0.028)
Unconstrained$^{\text{WW}}$ × ΔFor.BR	-0.000 (0.088)	0.040 (0.050)	0.180 (0.135)	0.143 (0.192)	-0.035 (0.336)	0.135 (0.197)	0.049 (0.084)
Unconstrained$^{\text{WW}}$ × ΔDom.BR	0.034 (0.038)	0.040 (0.032)	0.037 (0.045)	0.063 (0.124)	0.210 (0.155)	-0.037 (0.083)	0.059 (0.076)
Obs.	1,831	1,842	1,462	1,079	752	757	1,624
R^2	0.025	0.014	0.009	0.017	0.010	0.025	0.026

Panel B: Cost of Financing and Operating Efficiency

	Cost of Financing			Operating Efficiency	
	Interest Paid	Interest Rate	Interest Coverage	Wage Rate	ROS
Constrained$^{\text{WW}}$ × ΔFor.BR	-0.605*** (0.218)	-0.038** (0.018)	2.659 (3.495)	-1.846*** (0.637)	0.002 (0.005)
Constrained$^{\text{WW}}$ × ΔDom.BR	0.121*** (0.039)	-0.004 (0.009)	-1.747* (0.983)	-0.430 (0.351)	0.002 (0.002)
Unconstrained$^{\text{WW}}$ × ΔFor.BR	0.028 (0.083)	-0.002 (0.045)	-9.420 (7.532)	0.404 (0.652)	0.011 (0.011)
Unconstrained$^{\text{WW}}$ × ΔDom.BR	0.003 (0.062)	0.006 (0.035)	-0.579 (1.883)	-0.161 (0.921)	-0.008$^+$ (0.005)
Obs.	1,027	1,557	1,102	971	1,750
R^2	0.044	0.007	0.011	0.016	0.016

Growth Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
log Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
S.E. clustered cntr.-sector-year	✓	✓	✓	✓	✓	✓	✓

Note: This table shows OLS regressions of the effect of the net changes in foreign and domestic bank relationships (ΔFor. BR and ΔDom. BR) on financial variables in the matched sample of firms that experienced a change in number of bank relationships (treated) and firms without such change (controls). Changes in bank relationships are over 2-year interval, t-1 to t+1. We interact the changes in the number of bank relationships with an indicator of firm's financial constraints. The "Constrained$^{\text{WW}}$" indicator takes the value of one is the firm falls in top 20th percentile of the index of financial constraints of Whited and Wu (2006) in a given year (where the indes is computed as -0.091*(Cash flow) +0.021*(Long-term debt) -0.044*ln(Total Assets) +0.102*(2-digit industry sales growth) -0.035*(Sales growth) in each firm-year, and the higher value means more financial constraints); the "Unconstrained" is one minus Constrained. All regressions include the first lag of level and growth of the number of employees and of operating revenue. Interest coverage is defined as EBITDA to interest paid. The Wage Rate is total wage bill (in '000s $ 2005 base) over the number of employees. The ROS is return on sales, defined as EBIT to operating revenue. Growth rates of x_t are computed as log-difference for variables in monetary units ($ 2005 base) and simple difference for the ratios. Matching is done by the coarsened exact matching (CEM) methodology due to Iacus et al. (2011), using i) the first lags of operating revenue ($ 2005 base), the number of employees, the growth of operating revenue, the growth of the number of employees, the second lag of operating revenue, and ii) the lags of the number of domestic foreign bank relationships, the number of foreign bank relationships, of the indicators of whether the firm was majority foreign-owned, domestic acquisition dummy, foreign acquisition dummy, and the indicator consisting of the interaction of fixed effects at the level of country, two-digit industry, city of the firm's address, total assets deciles for size, and years to control for local credit demand effects. The details of the CEM methodology are described in Section 3.2. Robust standard errors (clustered by country-1-digit sector-year) in parenthesis: *** p < 0.01, ** p < 0.05, * p < 0.10, and $^+$p < 0.15.

Table 7: Effects of changes in bank relationships: Bank links. Matched sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Growth of firm outcomes, t to t+2						

Panel A: Selected Assets and Liabilities

	Assets			Liabilities			
	Fixed Assets	Current Assets	Working Capital	Total Debt	L-Term Debt	Loans	Trade Credit
ΔForeign BR	0.140 (0.127)	0.131 (0.105)	0.465** (0.186)	0.475** (0.205)	0.299* (0.157)	1.348** (0.675)	0.297 (0.252)
ΔDomestic BR	0.029^{+} (0.019)	0.032*** (0.012)	0.021 (0.021)	0.055^{+} (0.034)	0.057 (0.045)	-0.051 (0.041)	0.062** (0.027)
ΔForeign Bank Links	-0.006 (0.006)	-0.006 (0.004)	-0.019** (0.008)	-0.020** (0.009)	-0.009 (0.009)	-0.055** (0.028)	-0.015 (0.010)
ΔDomestic Bank Links	0.019** (0.009)	-0.004 (0.004)	-0.001 (0.006)	-0.006 (0.010)	-0.007 (0.012)	0.004 (0.015)	0.007 (0.010)
Obs.	1,831	1,842	1,462	1,079	752	757	1,624
R^2	0.037	0.019	0.013	0.019	0.011	0.029	0.032

Panel B: Cost of Financing and Operating Efficiency

	Cost of Financing			Operating Efficiency	
	Interest Paid	Interest Rate	Interest Coverage	Wage Rate	ROS
ΔForeign BR	0.738*** (0.190)	0.072** (0.035)	-0.730 (3.016)	0.806 (2.700)	0.027* (0.016)
ΔDomestic BR	0.109*** (0.036)	-0.004 (0.009)	-0.138 (0.333)	-0.435 (0.353)	0.001 (0.002)
ΔForeign Bank Links	-0.066*** (0.016)	-0.006*** (0.002)	-0.024 (0.153)	-0.080 (0.114)	-0.001 (0.001)
ΔDomestic Bank Links	-0.015 (0.019)	0.000 (0.001)	-0.059 (0.104)	0.059 (0.046)	0.000 (0.001)
Obs.	1,027	1,557	1,745	971	1,750
R^2	0.055	0.010	0.003	0.016	0.016

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Bank Links, t-1	✓	✓	✓	✓	✓	✓	✓
Growth Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
log Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
S.E. clustered cntr.-sector-year	✓	✓	✓	✓	✓	✓	✓

Note: This table shows OLS regressions of the effect of the net changes in foreign and domestic bank relationships (ΔForeign BR and ΔDomestic BR) and in average bank links (ΔForeign Bank Links and ΔDomestic Bank Links) on financial variables in the matched sample of firms that experienced a change in number of bank relationships (treated) and firms without such change (controls). Changes in bank relationships and links are over 2-year interval, t-1 to t+1. To measure bank links for a firm i in each year we i) aggregate the assets of all other identified client firms in i's country, ii) average these combined assets across all banks of firm i, separately for foreign and domestic banks, and iii) take the logarithmic transformation. In case the firm does not have foreign (domestic) banks we set the Linked Foreign (Domestic) Banks to zero. All regressions include the first lag of level and growth of the number of employees and of operating revenue and lag of bank links . Total debt is the sum of loans and long-term debt. Interest rate is defined as interest paid to total debt. Interest coverage is defined as EBITDA to interest paid. Trade credit is the debts to suppliers and contractors (trade creditors). The Wage Rate is total wage bill (in '000s $ 2005 base) over the number of employees. The ROS is return on sales, defined as EBIT to operating revenue. Growth rates of x_t are computed as log-difference for variables in monetary units ($ 2005 base) and simple difference for the ratios. Matching is done by the coarsened exact matching (CEM) methodology due to Iacus et al. (2011), using i) the first lags of operating revenue ($ 2005 base), the number of employees, the growth of operating revenue, the growth of the number of employees, the second lag of operating revenue, and ii) the lags of the number of domestic foreign bank relationships, the number of foreign bank relationships, of the indicators of whether the firm was majority foreign-owned, domestic acquisition dummy, foreign acquisition dummy, and the indicator consisting of the interaction of fixed effects at the level of country, two-digit industry, city of the firm's address, total assets deciles for size, and years to control for local credit demand effects. The details of the CEM methodology are described in Section 3.2. Robust standard errors (clustered by country-1-digit sector-year) in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, and $^{+}p < 0.15$.

Table 8: Effects of changes in bank relationships: Bank specialization. Matched sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Growth of firm outcomes, t to t+2						
Measure of specialization	Number of banks that are specialized in firm's 4-digit sector						
	Fixed Assets	Working Capital	Total Debt	Loans	Trade Credit	Inerest Rate	ROS
ΔForeign BR	0.078	0.466**	0.462**	1.388*	0.301	0.078**	0.028*
	(0.130)	(0.199)	(0.226)	(0.821)	(0.263)	(0.035)	(0.016)
ΔDomestic BR	0.023	0.022	0.072**	-0.048	0.068**	-0.005	0.001
	(0.018)	(0.022)	(0.034)	(0.043)	(0.027)	(0.010)	(0.002)
ΔForeign Bank Links	-0.004	-0.019**	-0.018*	-0.057*	-0.014	-0.006***	-0.001
	(0.006)	(0.008)	(0.009)	(0.033)	(0.011)	(0.002)	(0.001)
ΔDomestic Bank Links	0.019**	-0.001	-0.006	0.004	0.007	0.000	0.000
	(0.009)	(0.006)	(0.010)	(0.015)	(0.010)	(0.001)	(0.001)
ΔSpecialist Foreign Banks	0.226	-0.062	0.095	0.114	-0.177	-0.035	-0.020
	(0.432)	(0.200)	(0.202)	(0.363)	(0.249)	(0.045)	(0.014)
ΔSpecialist Domestic Banks	0.106+	-0.018	-0.329	-0.061	-0.124	0.035	-0.011*
	(0.072)	(0.066)	(0.268)	(0.124)	(0.103)	(0.030)	(0.006)
Obs.	1,831	1,462	1,079	757	1,624	1,557	1,750
R²	0.042	0.013	0.023	0.029	0.033	0.012	0.018
Bank Links, t-1	✓	✓	✓	✓	✓	✓	✓
Bank Specialization, t-1	✓	✓	✓	✓	✓	✓	✓
Growth Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
log Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
S.E. clustered cntr.-sector-year	✓	✓	✓	✓	✓	✓	✓

Note: This table shows robustness of results in Table 7, where we estimate the OLS regressions of the effect of the net changes in foreign and domestic bank relationships (ΔForeign BR and ΔDomestic BR), average bank links (ΔForeign Bank Links and ΔDomestic Bank Links), and average bank specialization (ΔSpecialist Foreign Banks and ΔSpecialist Domestic Banks) on financial variables in the matched sample of firms that experienced a change in number of bank relationships (treated) and firms without such change (controls). Changes in bank relationships, links, and specialization are over 2-year interval, t-1 to t+1. To measure **specialist** banks for a firm i in each year we i) determine within firm i's country in which 4-digit sector a firm's *bank* has most of its other clients (as measured by clients' total assets), and ii) count the number of banks across all banks of firm i that specialize in the *same* sector as firm i's sector, separately for foreign and domestic banks. In case the firm does not have foreign (domestic) banks we set the Specialist Foreign (Domestic) Banks to zero. Bank **links** is measured as in Table 7. All regressions include the first lag of level and growth of the number of employees and of operating revenue, and lag of bank links and specialization. *Total debt* is the sum of loans and long-term debt. Interest rate is defined as interest paid to total debt. Trade credit is the debts to suppliers and contractors (trade creditors). The *ROS* is return on sales, defined as EBIT to operating revenue. Growth rates of x_t are computed as log-difference for variables in monetary units ($ 2005 base) and simple difference for the ratios. Matching is done by the coarsened exact matching (CEM) methodology due to Iacus et al. (2011), using i) the first lags of operating revenue ($ 2005 base), the number of employees, the growth of operating revenue, the growth of the number of employees, the second lag of operating revenue, and ii) the lags of the number of domestic foreign bank relationships, the number of foreign bank relationships, of the indicators of whether the firm was majority foreign-owned, domestic acquisition dummy, foreign acquisition dummy, and the indicator consisting of the interaction of fixed effects at the level of country, two-digit industry, city of the firm's address, total assets deciles for size, and years to control for local credit demand effects. The details of the CEM methodology are described in Section 3.2. Robust standard errors (clustered by country-1-digit sector-year) in parenthesis: *** p < 0.01, ** p < 0.05, * p < 0.10, and +p < 0.15.

Table 9: Extension: Real effects of changes in bank relationships. Matched sample

	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)
Dependent variable:					Growth of firm outcomes, t to t+2						
Measure of bank links:		Panel A: Bank client assets						Panel B: Geographic network			
	Employm.	Wage rate	Output	Productivity (Rev/E)	Productivity (Rev/WB)		Employm.	Wage rate	Output	Productivity (Rev/E)	Productivity (Rev/WB)
ΔForeign BR	0.155* (0.081)	4.732** (2.099)	0.010 (0.101)	-0.119 (0.107)	-0.270 (0.237)		0.131** (0.052)	2.735* (1.543)	-0.073 (0.093)	-0.153* (0.081)	-0.142 (0.135)
ΔDomestic BR	0.006 (0.009)	-0.483 (0.356)	-0.000 (0.011)	-0.005 (0.011)	-0.004 (0.012)		0.005 (0.009)	-0.469 (0.356)	-0.001 (0.011)	-0.005 (0.011)	-0.004 (0.012)
ΔForeign Bank Links	-0.006* (0.004)	-0.238*** (0.091)	-0.001 (0.004)	0.005 (0.005)	0.015+ (0.010)		-0.018** (0.009)	-0.593** (0.241)	0.012 (0.014)	0.025* (0.013)	0.035* (0.021)
ΔDomestic Bank Links	0.000 (0.002)	0.055 (0.046)	-0.002 (0.003)	-0.001 (0.002)	0.001 (0.002)		0.001 (0.007)	0.207 (0.157)	-0.001 (0.008)	0.001 (0.007)	0.004 (0.008)
ΔSpecialist Foreign Banks	-0.052 (0.063)	-2.257 (1.882)	0.020 (0.105)	0.040 (0.083)	0.068 (0.167)		-0.088 (0.070)	-2.751 (2.223)	0.079 (0.122)	0.119 (0.098)	0.115 (0.157)
ΔSpecialist Domestic Banks	0.016 (0.033)	0.829 (0.998)	0.181*** (0.054)	0.148*** (0.044)	0.069+ (0.044)		0.015 (0.033)	0.785 (0.967)	0.181*** (0.055)	0.150*** (0.045)	0.072+ (0.045)
Obs.	1,820	971	1,838	1,820	977		1,820	971	1,838	1,820	977
R²	0.027	0.033	0.023	0.016	0.035		0.028	0.034	0.022	0.017	0.035
Bank Links, t-1	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Bank Specialization, t-1	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Growth Empl. & Assets, t-1	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
log Empl. & Assets, t-1	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
S.E. clustered cntr.-sector-year	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

Note: This table shows OLS regressions of the effect of the net changes in foreign and domestic bank relationships (ΔForeign BR and ΔDomestic BR), average bank links (ΔForeign Bank Links and ΔDomestic Bank Links), and average bank specialization (ΔSpecialist Foreign Banks and ΔSpecialist Domestic Banks) on variables representing real firms activity in the matched sample of firms that experienced a change in number of bank relationships (treated) and firms without such change (controls). Changes in bank relationships, links, and specialization are over 2-year interval, t-1 to t+1. Bank **links** is measured by average client assets of the firm's banks, as in Table 7 in Panel A, and by the average number of cities served by the firm's banks, as in Appendix Table OA1.2 in Panel B; bank **specialization** is measured as in Table 8. All regressions include the first lag of level and growth of the number of employees and of operating revenue, and lag of bank links and specialization. The Wage Rate is total wage bill (in '000s $ 2005 base) over the number of employees. *Output* is measured by operating revenue. The *Productivity (Rev/E)* is equal to operating revenue over the number of employees (the cost of employees); The *Productivity (Rev/E)* is equal to operating revenue over the number of employees. The results with productivity defined with sales instead of operating revenue is qualitatively similar. Growth rates of x_t are computed as log-difference for variables in monetary units ($ 2005 base) and simple difference for the ratios. Matching is done by the coarsened exact matching (CEM) methodology due to Iacus et al. (2011), using i) the first lags of operating revenue ($ 2005 base), the number of bank relationships, the growth of operating revenue, the second lag of operating revenue, and ii) the lags of the number of domestic foreign bank relationships, the number of foreign bank relationships, of the indicators of whether the firm was majority foreign-owned, domestic acquisition dummy, foreign acquisition dummy, and the indicator consisting of the interaction of fixed effects at the level of country, two-digit industry, city of the firm's address, total assets deciles for size, and years to control for local credit demand effects. The details of the CEM methodology are described in Section 3.2. Robust standard errors (clustered by country-1-digit sector-year) in parenthesis: *** p < 0.01, ** p < 0.05, * p < 0.10, and + p < 0.15.

Appendix

A1 Example firm

Table A1.1: Example firm ES000207064: bank names

Year	Bank Name	Code	Event	Foreign Owner	Country
2009	Banco Mare Nostrum	502			
2009	Cajamar Caja Rural	1432			
2009	Caixabank	1574			
2010	Banco Mare Nostrum	502	dropped		
2010	Cajamar Caja Rural	1432			
2010	Caixabank	1574			
2011	Cajamar Caja Rural	1432	dropped		
2011	Caixabank	1574			
2012	Caixabank	1574	dropped		
2012	Cajas Rurales Unidas	1659	added		
2013	Banco Caixa General	462	added	Caixa Geral de Depositos	Portugal
2013	Banco Mare Nostrum	502	added		
2013	Cajas Rurales Unidas	1659			

Note: *ES000207064* denotes a Spanish (target) firm. *Dropped* is an event where the bank is no longer a relationship next year. It is counted as having been dropped in the next year in Table A1.2. *Added* is an event where the bank was not yet a relationship in the previous year. *Foreign Owner* lists the ultimate owner bank of the bank in the third column, and *Country* that ultimate owner's home country.

Table A1.2: Example firm ES000207064: bank relationships and acquisitions

Year	Bank relationships			Domestic Bank relationships			Foreign Bank relationships			Acquisition	
	Total	+	-	Total	+	-	Total	+	-	Foreign	Domestic
2009	3			3			0			0	1
2010	3	0	0	3	0	0	0	0	0	0	0
2011	2	0	1	2	0	1	0	0	0	0	0
2012	2	1	1	2	1	1	0	0	0	0	0
2013	3	2	1	2	1	1	1	1	0	0	0

Note: *ES000207064* denotes a Spanish (target) firm. + denotes an addition, while − denotes a bank that is dropped, both relative to the previous year. *Foreign* stand for a majority acquisition event where the buyer was a foreign firm, and *Domestic* stands for a majority acquisition event where the buyer was a domestic firm, both from the perspective of the target firm.

A2 Summary statistics

Table A2.1: Summary statistics: Regression sample for Section 4.1

Variable	N	mean	median	s.d.	min	max	skewness	kurtosis
Bank relationships	659,932	1.636	1.000	0.99	1.00	22.00	2.10	11.39
Δ bank relationships, t-1 to t+1	659,932	-0.025	0.000	0.55	-15.00	20.00	0.84	33.06
Δ foreign bank relationships, t-1 to t+1	659,932	0.015	0.000	0.22	-3.00	5.00	1.48	29.13
Δ domestic bank relationships, t-1 to t+1	659,932	-0.040	0.000	0.55	-14.00	17.00	0.15	27.07
Banks added, t-1 to t+1	659,932	0.241	0.000	0.60	0.00	20.00	3.53	23.94
Foreign banks added, t-1 to t+1	659,932	0.034	0.000	0.19	0.00	5.00	5.75	39.11
Domestic banks added, t-1 to t+1	659,932	0.207	0.000	0.54	0.00	17.00	3.64	24.81
Majority acquisition	659,932	0.017	0.000	0.13	0.00	1.00	7.46	56.72
New Foreign acquisition	659,932	0.004	0.000	0.06	0.00	1.00	16.48	272.75
Existing Foreign acquisition	659,932	0.002	0.000	0.04	0.00	1.00	24.64	607.92
New Domestic acquisition	659,932	0.005	0.000	0.07	0.00	1.00	13.73	189.40
Existing Domestic acquisition	659,932	0.007	0.000	0.08	0.00	1.00	12.25	151.12
Majority foreign owned , >50%, t-1	659,932	0.208	0.000	0.41	0.00	1.00	1.44	3.07
Main owner controls >50%, t-1	659,932	0.648	1.000	0.48	0.00	1.00	-0.62	1.38
Joint venture , 50-50 split, t-1	659,932	0.123	0.000	0.33	0.00	1.00	2.29	6.24
Number of shareholders, t-1	659,932	1.582	1.000	0.98	0.00	10.00	2.03	8.66
Shared bank, t-1	659,932	0.001	0.000	0.03	0.00	1.00	30.83	951.66
Shared foreign bank, t-1	659,932	0.000	0.000	0.00	0.00	1.00	363.30	1.3e+05

Note: This table shows summary statistics for firm-year observations where we can track bank relationships for at least five years and two-period changes in bank relationships (from t-1 to t+1) for at least three observations per firm. Bank relationships are in number of individual unique banks. All financial variables are in constant US dollars with the 2005 base.

Table A2.2: Summary statistics: Regression sample for Section 4.2.

Variable	N	mean	median	s.d.	min	max	skewness	kurtosis
Bank relationships, t	2,183	1.825	2.000	0.88	1.00	6.00	0.75	2.94
Δ Bank relationships, t-1 to t+1	1,879	0.218	0.000	0.97	-4.00	8.00	0.81	6.80
Δ Foreign bank relationships , t-1 to t+1	1,879	0.090	0.000	0.39	-2.00	3.00	1.24	9.25
Δ Domestic bank relationships , t-1 to t+1	1,879	0.127	0.000	0.96	-4.00	8.00	0.71	6.74
growth Foreign bank links, t-1 to t+1	2,183	1.948	0.000	8.38	-25.51	25.95	1.39	7.41
growth Domestic bank links, t-1 to t+1	2,183	3.175	0.101	9.84	-26.05	28.18	1.18	5.34
ln Foreign bank links, t-1	1,879	0.992	0.000	4.63	0.00	25.51	4.48	21.19
ln Domestic bank links, t-1	1,879	24.66	25.20	2.77	0.00	28.18	-4.22	35.06
growth 1+Foreign bank cities, t-1 to t+1	2,183	0.546	0.000	2.16	-5.76	7.52	2.08	8.45
growth 1+Domestic bank cities, t-1 to t+1	2,183	0.839	0.061	2.64	-7.66	7.88	0.87	5.15
ln 1+Foreign bank cities, t-1	1,879	0.196	0.000	0.94	0.00	5.87	4.80	24.82
ln 1+Domestic bank cities, t-1	1,879	6.122	6.711	1.53	0.00	8.10	-1.45	4.95
Δ Foreign bank specialization, t-1 to t+1	2,183	0.002	0.000	0.07	-1.00	1.00	4.43	181.7
Δ Domestic bank specialization, t-1 to t+1	2,183	0.017	0.000	0.24	-2.00	3.00	3.46	53.88
Foreign bank specialization, t-1	1,879	0.002	0.000	0.05	0.00	1.00	21.60	467.8
Domestic bank specialization, t-1	1,879	0.039	0.000	0.21	0.00	2.00	5.60	36.69
growth Fixed Assets, t to t+1	2,172	-0.047	-0.053	0.546	-4.998	5.121	0.220	31.066
growth Current Assets, t to t+1	2,183	-0.010	-0.001	0.348	-4.396	5.325	0.352	45.046
growth Working Capital, t to t+1	1,787	0.033	0.000	0.640	-4.230	5.558	1.106	15.474
growth Total Debt (=LT Debt+Loans), t to t+1	1,376	-0.103	-0.068	1.012	-12.569	6.657	-1.829	31.989
growth Long-Term Debt, t to t+1	988	-0.067	-0.083	0.953	-7.332	6.061	0.232	16.204
growth Loans, t to t+1	995	-0.147	-0.057	1.092	-12.569	7.070	-1.782	28.534
growth Trade Credit, t to t+1	1,930	0.010	-0.008	0.822	-7.410	6.587	-0.124	18.723
growth Interest paid, t to t+1	1,400	-0.110	-0.067	1.031	-7.107	5.793	-1.210	15.275
Δ Interest rate, t to t+1	1,857	0.012	0.000	0.330	-2.899	2.925	1.910	51.982
Δ Interest coverage (EBITDA/Interest paid), t to t+1	1,502	0.367	0.000	24.926	-101.714	101.714	-0.092	12.090
Δ ROS (EBIT/Oprev), t to t+1	2,070	-0.000	0.000	0.050	-0.272	0.272	-0.317	10.767
growth Number of Employees, t to t+1	2,167	-0.016	0.000	0.246	-3.611	2.485	-2.908	52.164
growth Operating Revenue, t to t+1	2,175	-0.013	-0.011	0.286	-1.700	3.344	1.566	23.511
Δ Wage rate in '000s, t to t+1	1,358	-0.265	0.021	9.384	-134.650	77.480	-3.295	62.083
growth Labor productivity (Oprev/Empl), t to t+1	2,161	0.002	-0.010	0.319	-1.907	3.049	1.607	18.428
growth Labor productivity (Oprev/Wagebill), t to t+1	1,364	0.020	-0.004	0.304	-1.700	3.246	3.484	31.027

Note: This table shows summary statistics for firm-year observations in the matched sample used to study the effect of changes in banking relationships on company outcomes discussed in Section 4.2. "Growth" represents the log-difference and "Δ" the simple difference over stated time period. Bank relationships are in number of individual unique banks. All financial variables are in constant US dollars with the 2005 base. The Added Value is the variable reported in Orbis , defined as profit for period plus depreciation plus taxation plus Interests paid plus cost of employees. The Exporter is the indicator variable when the company reports non-zero or non-missing part of the turnover made abroad.

A3 Search of the specification for bank relationships regressions

To explore our data more we estimate several regressions where we correlate the *level* and the *changes* of bank relationships with contemporaneous acquisition status:

$$BR_{i,c,t+k} = \mathbf{ACQ}_{i,c,t}\,\beta_1 + \mathbf{X}_{i,c,t}\,\beta_2 + \alpha_i + \delta_{s4,t} + \epsilon_{i,c,t} \tag{8}$$

$$\Delta BR_{i,c,t+k} = \mathbf{ACQ}_{i,c,t}\,\gamma_1 + \mathbf{X}_{i,c,t}\,\gamma_2 + \alpha_i + \delta_{s4,t} + \zeta_{i,c,t} \tag{9}$$

where the second equation is the differenced version of the first equation, the α_i is firm fixed effect, the $\delta_{s4,t}$ sector-year effects, k takes the value of 0 (the year of acquisition) and 1 (the year following the acquisition year) and ΔBR is defined from the year before acquisition $t-1$ to period $t+k$. These preliminary regressions are used as the "specification search" to determine the horizon k over which we should estimate the equation (1). Appendix Table A3.1 reports the results, where we condition on some controls reflecting ownership structure but suppress the coefficients for brevity.

In Panel A the dependent variable is the number of bank relationships. Column 1 shows that acquisition in time t coincides with the target having more bank relationships in the same year. However, column 2 demonstrates that the coefficient to Acquisition dummy decreases one year later following the acquisition. The same patterns are seen when we split the acquisition dummy into two indicators, differentiating between the acquisition by the entity in company's own country (the Domestic acquisition) or another country (the Foreign acquisition). We conjecture that new banks could have been added but the existing banks retained or the acquirers may have used additional banks to help through the acquisition process (as consultants, bridge loan providers, etc.) all of which mentioned in the annual report of the target firm in the year of acquisition. In the subsequent year the true number of bank relationships associated with the M&A shocks is observed. In Panel B we use changes in banking relationships at these two time horizons and results are qualitatively similar: there is a spike in bank relationships in the year of acquisition followed by decrease, such that relative to the reference sample of non-acquired firms the change in banking relation-

ships is statistically insignificant (column 2 of Panel B). One observation is the difference in these changes between domestic and foreign acquisitions seen in column 4, which we will discuss in the main analysis. Given the results from this table we prefer to consider the specification (1) as the main estimation equation and define the changes in the number of banking relationships $\Delta BR_{i,c,t+1}$ from $t-1$ to $t+1$.

Table A3.1: Acquisitions and bank relationships at various time horizons

	(1)	(2)	(3)	(4)
Panel A: Dependent variable is Number of bank relationships				
Dependent variable timing:	t	t+1	t	t+1
Majority acquisition	0.077***	0.023***		
	(0.010)	(0.008)		
Foreign acquisition			0.037***	0.022**
			(0.013)	(0.009)
Domestic acquisition			0.098***	0.023**
			(0.011)	(0.010)
Obs.	652,477	652,477	652,477	652,477
R-squared	0.921	0.934	0.921	0.934

Panel B: Dependent variable is Changes in Number of bank relationships

Dependent variable timing:	t-1 to t	t-1 to t+1	t-1 to t	t-1 to t+1
Majority acquisition	0.054***	-0.000		
	(0.010)	(0.012)		
Foreign acquisition			0.076***	0.061***
			(0.014)	(0.017)
Domestic acquisition			0.042***	-0.032**
			(0.011)	(0.014)
Observations	652,477	652,477	652,477	652,477
R-squared	0.316	0.530	0.316	0.530
4 digit Industry-year FE	✓	✓	✓	✓
cluster country-sector-year	✓	✓	✓	✓

Note: This table shows OLS regressions of the effect of acquisition on number (in Panel A) or changes in number (in Panel B) of bank relationships at various time intervals relative to acquisition year. t refers to the acquisition year, $t-1$ is the year before the acquisition, and $t+1$ is the year following the acquisition. Standard controls, listed in Table 3, are included but the coefficients are notreported for space considerations. Robust standard errors (clustered by country-sector-year) in parenthesis: *** p < 0.01, ** p < 0.05, * p < 0.10. Table A2.1 contains summary statistics. See Section 3 for variable definitions and sources.

Online Appendix (not for publication)

for Corporate Acquisitions and Bank Relationships

Steven Poelhekke   Razvan Vlahu   Vadym Volosovych

September 23, 2021

This Appendix contains additional results, figures, and tables referred to but not included in the main text.

OA1 Additional tables and figures

Table OA1.1: Acquisitions and change in foreign and domestic bank relationships: Control sample without minority shareholder change

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	Changes in Bank relationships, t-1 to t+1						
Type of banks	All banks	*Foreign* banks			*Domestic* banks		
Direction of change	Net change	Net change	Added	Dropped	Net change	Added	Dropped
Foreign acquisition	0.050**	-0.017**	-0.016***	0.001	0.067***	0.049***	-0.016
	(0.022)	(0.007)	(0.006)	(0.004)	(0.021)	(0.016)	(0.021)
Domestic acquisition	-0.042**	0.037***	0.045***	0.009***	-0.078***	0.124***	0.206***
	(0.017)	(0.006)	(0.006)	(0.003)	(0.017)	(0.016)	(0.019)
Obs.	450,391	450,391	450,391	450,391	450,391	450,391	450,391
R-squared	0.542	0.528	0.526	0.599	0.532	0.585	0.575
Standard controls	✓	✓	✓	✓	✓	✓	✓
4 digit Industry-year FE	✓	✓	✓	✓	✓	✓	✓
cluster country-sector-year	✓	✓	✓	✓	✓	✓	✓

Note: This table replicates Table 4 but in the control sample we also exclude minority shareholder change. The table shows OLS regressions of the effect of acquisition on changes in number of bank relationships, by type of the bank (foreign or domestic), from the year before the acquisition $t-1$ the year following the acquisition $t+1$. Foreign bank is defined as the bank with headquarters outside of target own country. Standard controls, listed in Table 3, are included but the coefficients are not reported for space considerations. Robust standard errors (clustered by country-sector-year) in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Table A2.1 contains summary statistics. See Section 3 for variable definitions and sources.

Table OA1.2: Effects of changes in bank relationships on firms: Alternative measure of bank links (geographic network). Matched sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable:	Growth of firm outcomes, t to t+2						
	Fixed Assets	Working Capital	Total Debt	Loans	Trade Credit	Inerest Rate	ROS
ΔForeign BR	0.019	0.302*	0.325**	0.590**	0.061	0.049*	0.019*
	(0.101)	(0.172)	(0.130)	(0.284)	(0.206)	(0.027)	(0.012)
ΔDomestic BR	0.027	0.023	0.053$^+$	-0.056	0.062**	-0.003	0.001
	(0.019)	(0.021)	(0.034)	(0.041)	(0.027)	(0.009)	(0.002)
ΔLinked Foreign Banks	-0.006	-0.045*	-0.049**	-0.092**	-0.018	-0.018***	-0.003
	(0.019)	(0.027)	(0.024)	(0.047)	(0.029)	(0.006)	(0.002)
ΔLinked Domestic Banks	0.062**	-0.008	-0.019	0.015	0.027	-0.003	0.001
	(0.025)	(0.019)	(0.030)	(0.040)	(0.026)	(0.004)	(0.002)
Obs.	1,831	1,462	1,079	757	1,624	1,557	1,750
R^2	0.037	0.012	0.018	0.029	0.031	0.011	0.015
Bank Links, t-1	✓	✓	✓	✓	✓	✓	✓
Growth Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
log Empl. & Assets, t-1	✓	✓	✓	✓	✓	✓	✓
S.E. clustered cntr.-sector-year	✓	✓	✓	✓	✓	✓	✓

Note: This table shows robustness of results in Table 7, where we estimate the OLS regressions of the effect of the net changes in foreign and domestic bank relationships (ΔForeign BR and ΔDomestic BR) and in bank links (ΔLinked Foreign Banks and ΔLinked Domestic Banks) on financial variables in the matched sample of companies that experienced a change in number of bank relationships (treated) and companies without such change (controls). Changes in bank relationships and links are over 2-year interval, t-1 to t+1. To measure bank links for a firm i in each year we i) count the number of cities where the bank has clients (in our data) in i's country, ii) average these cites counts across all banks of firm i, separately for foreign and domestic banks, and iii) take the logarithmic transformation of one plus the latter value. In case the firm does not have foreign (domestic) banks we set the Linked Foreign (Domestic) Banks to zero. All regressions include the first lag of level and growth of the number of employees and of operating revenue and lag of bank links. Total debt is the sum of loans and long-term debt. Interest rate is defined as interest paid to total debt. Trade credit is the debts to suppliers and contractors (trade creditors). The ROS is return on sales, defined as EBIT to operating revenue. Growth rates of x_t are computed as log-difference for variables in monetary units (\$ 2005 base) and simple difference for the ratios. Matching is done by the coarsened exact matching (CEM) methodology due to Iacus et al. (2011), using i) the first lags of operating revenue (\$ 2005 base), the number of employees, the growth of operating revenue, the growth of the number of employees, the second lag of operating revenue, and ii) the lags of the number of domestic foreign bank relationships, the number of foreign bank relationships, of the indicators of whether the company was majority foreign-owned, domestic acquisition dummy, foreign acquisition dummy, and the indicator consisting of the interaction of fixed effects at the level of country, two-digit industry, city of the firm's address, total assets deciles for size, and years to control for local credit demand effects. The details of the CEM methodology are described in Section 3.2. Robust standard errors (clustered by country-1-digit sector-year) in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$, and $^+p < 0.15$.

OA2 Balancing tests

Table OA2.1: Balancing test in matched sample

| Variable	Means of variables		Standardiz.	t-test equality of means	
	Treated	Controls	% bias	t-stats	p-value
Operating Revenue (Output)	2.2E+07	2.2E+07	0.1	0.02	0.99
Employment	165	201	-2.3	-0.40	0.69
Growth Operating Revenue	-0.077	-0.064	-3.3	-0.62	0.54
Growth Operating Revenue, t-2	-0.009	-0.023	3.6	0.70	0.48
Growth Employment	-0.017	-0.029	6.8	1.15	0.25
log Employment	3.310	3.306	0.2	0.04	0.97
log Operating Revenue	15.466	15.471	-0.3	-0.06	0.95
log Total Assets	15.262	15.246	0.9	0.17	0.87
Growth Total Assets	-0.043	-0.061	4.6	0.87	0.38
Growth Fixed Assets	-0.051	-0.073	3.6	0.70	0.49
Growth Working Capital	0.017	-0.037	8.4	1.37	0.17
Growth Total Liabilities	-0.062	-0.087	4.8	0.91	0.36
Growth Long-Term Debt	-0.164	-0.154	-1.1	-0.15	0.88
Growth Current Liabilities	-0.046	-0.091	7.3	1.33	0.18
Growth Loans	-0.029	-0.111	7.8	1.09	0.28
Growth Trade credit	-0.078	-0.132	5.4	1.00	0.32
Growth Labor Productivity (Oper.Rev.)	-0.061	-0.035	-6.1	-1.13	0.26
Δ Average Wage	0.504	0.701	-2.7	-0.31	0.75
Δ ROS	-0.004	-0.004	-1.4	-0.23	0.82

Notes: The table reports the means of the companies that experienced a change in number of bank relationships (treated) and companies without such change (controls) in the matched sample. Growth rates of x_t are computed as log-difference. The "standardized % bias" is the difference of the sample means in the treated and controls in matched sample as a percentage of the square root of the average of the sample variances in the treated and control groups. The t-tests for equality of means are based on a regression of the variable on a treatment indicator; the regression is weighted using the importance weight estimated by the coarsened exact matching (CEM) methodology described in Iacus et al. (2011). The details of the CEM methodology are described in Section 3.2.

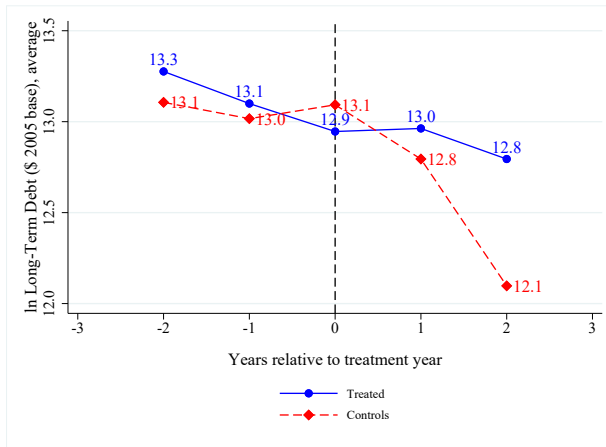Figure OA2.1: Selected main company outcomes in matched sample.
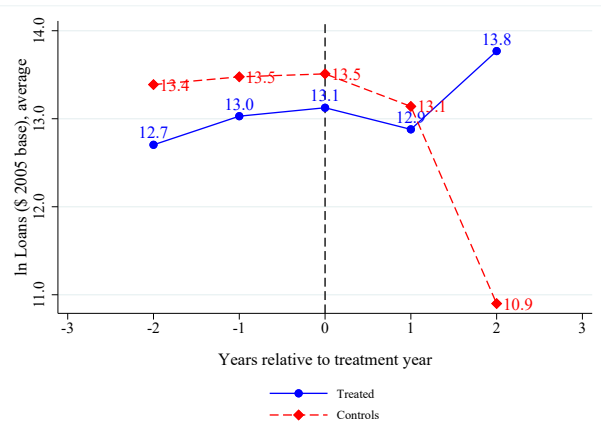
Panel A: log Fixed Assets
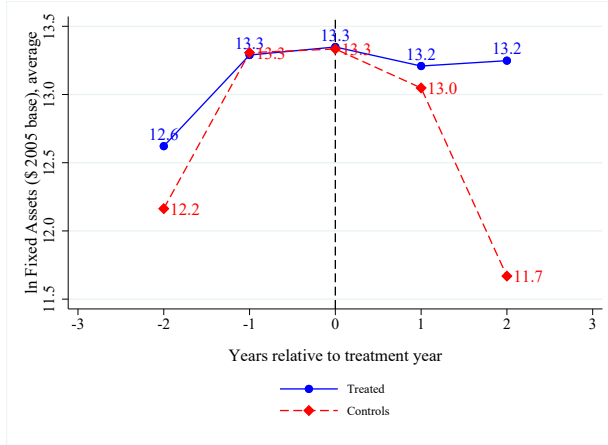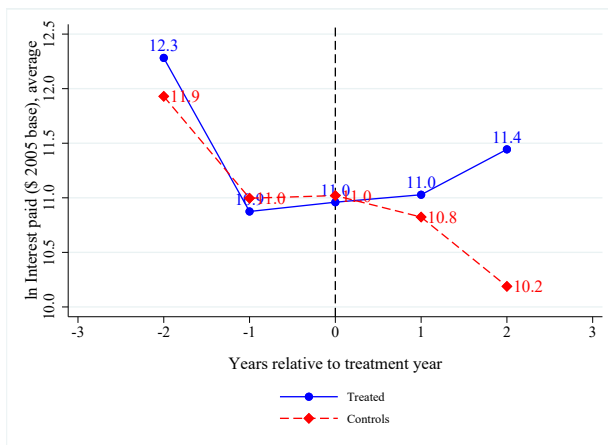
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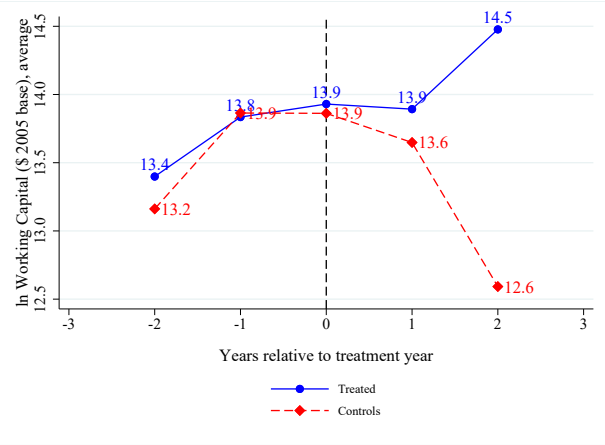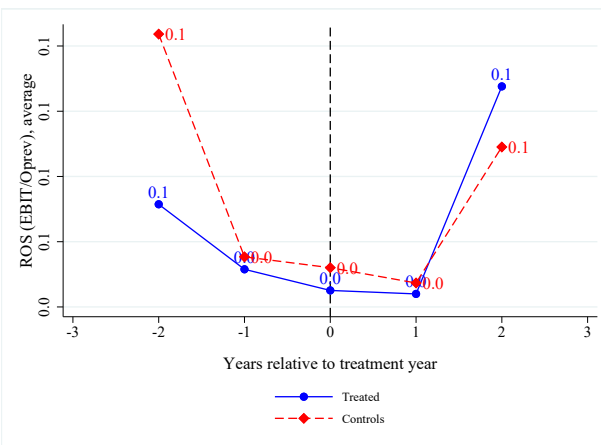
Panel C: log Long-term Debt
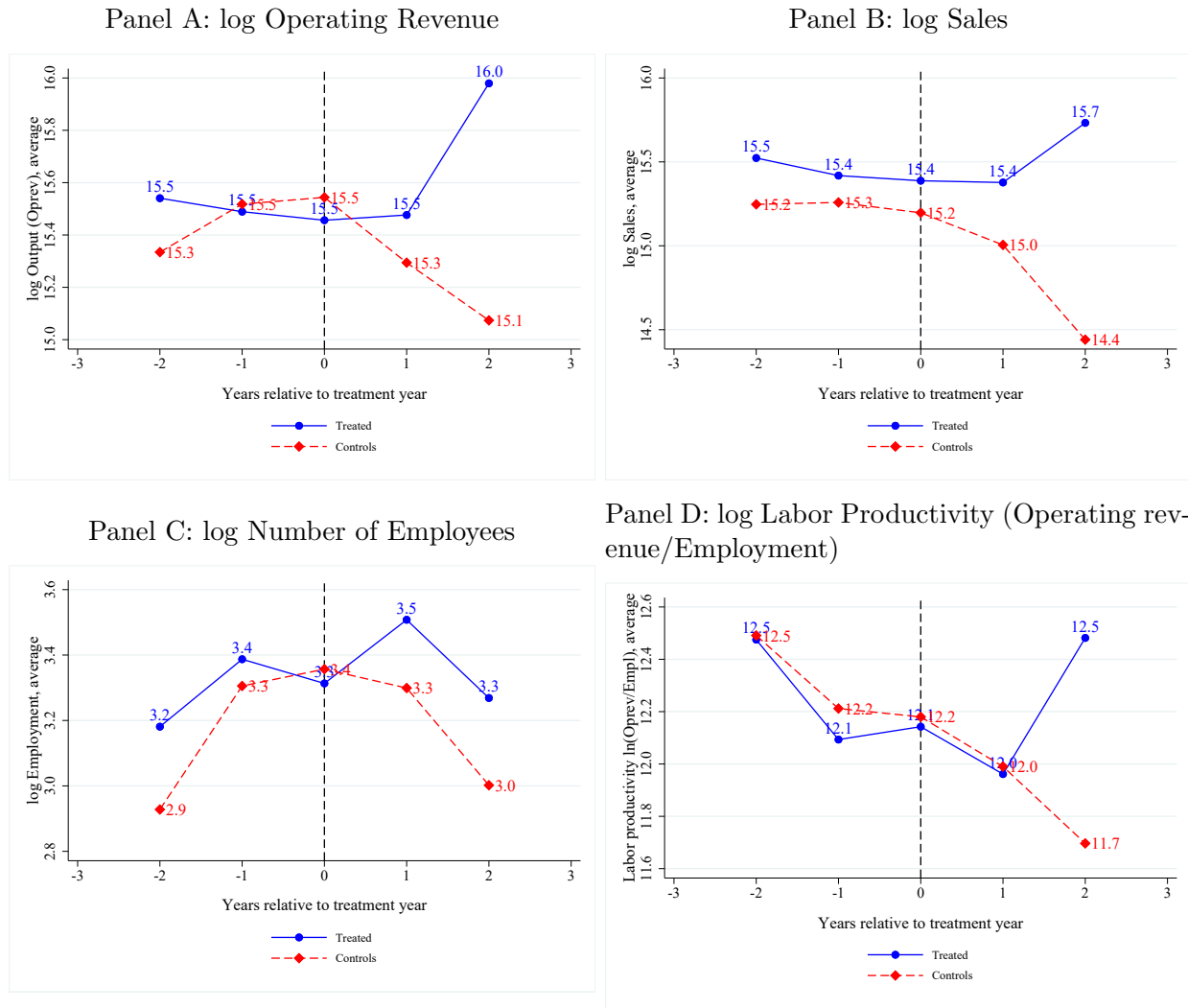
Panel D: log Loans

Panel E: log Interest Paid

Panel F: ROS (EBIT/Operating Revenue)

Note: This figure reports the development of selected outcomes between the companies that experienced a change in number of bank relationships (treated) and companies without such change (controls) in the matched sample of Table 5. We report the average of given outcome over these two sub-groups in a year relative the treatment year. $t=0$ represents the year when the company experienced a change in number of banking relationships.

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Figure OA2.2: Selected "real" company outcomes in matched sample (Extension Section 4.4.

Panel A: log Operating Revenue

Panel B: log Sales

Panel C: log Number of Employees

Panel D: log Labor Productivity (Operating revenue/Employment)

Note: This figure reports the development of additional outcomes between the companies that experienced a change in number of bank relationships (treated) and companies without such change (controls) in the matched sample of Table 9. We report the average of given outcome over these two sub-groups in a year relative the treatment year. $t=0$ represents the year when the company experienced a change in number of banking relationships.

OA3 Additional evidence on the channels

The results in Section 4.1 of the manuscript are consistent with the idea that foreign buyers seek local knowledge and services of domestic banks rather than access to foreign capital through foreign banks, while domestic acquirers actively reshuffle the portfolio of banks. In this Appendix we provide additional evidence on the hypothesis of whether foreign bank relationships are sought to relax financing constraints. If so, adding new relationships with foreign banks should be more pronounced for countries with relatively less developed domestic financial markets because, in countries with more developed financial systems, the financial constraints are weaker. Thus, the added value of having more foreign banks (in terms of increasing the availability and cost of external finance) is likely to be smaller. We split the sample of countries by the median level of financial development, as measured by private credit over GDP, and interact the binary variable taking the value of one if firm country is below the median (the Low FD Country) with our acquisition dummies. Table OA3.1 reports the results Column 1 replicates column 2 from Table 4 for comparison: foreign acquisition is associated with a reduction in foreign banks. In column 2, we see that this effect is more pronounced in a less financially developed economy. On the net, domestic acquisition tends to be associated with adding more foreign banks relative to non-acquired firms (column 1), but this is reversed in the weak local financial markets, where the overall effect is negative (the sum of the coefficients 0.059-0.091 is negative and exactly equal to the coefficient to Domestic acquisition in column 1 with the sign reversed).

The finding that *any* acquisition in a less financially developed country is followed by the reduction of foreign bank relationships, although surprising, does not necessarily mean that foreign banks do not provide access to financing in these countries. The explanation may be structural because these countries may have few foreign banks available; recall that almost all foreign banks are *already* present in the target country, and that added banks almost always have a relationship with the buyer already (Table 2). We conjecture that targets of foreign acquisition may receive financing through internal capital markets since foreign buyers

have easier access to financing outside of financially under-developed markets.[35] Domestic acquirers may simply try to optimize the relationships by focusing on fewer core foreign banks.

In column 4 of Table OA3.1 we repeat the exercise for changes in domestic banks, where column 3 repeats column 5 of Table 4. Both types of buyers keep and add domestic banks when the acquisition happens in a less financially developed country, where bank relationships are harder to form, access to local capital is more difficult to obtain, and local knowledge counts more heavily. Hence, domestic bank relationships tend to be retained and built up. The overall effect of domestic acquisition in such markets is also positive but much more muted in magnitude.

The results from triple diff-in-diff regressions in this table are more consistent with the access to finance role of domestic banks, but not necessarily of foreign banks.

In Table OA3.2, we assess the risk appetite of foreign and domestic banks and acquirers, using sector growth as a proxy of the average risk of the firms in this sector. We interact the acquisition dummies with the indicator slow-growth sector, taking the value of one if in the given year the target firm's industry lies below the sample median in terms of the average industry growth rate within the EU-15 sample, weighted by country size. This coefficient of this interaction implies that, overall, foreign banks flee slow-growing sectors and are being replaced by domestic banks. But these trends are reversed by domestic acquisitions. It looks like domestic acquirers lead the way to foreign banks by pointing to a better target in overall under-performing sectors. Domestic acquirers crowd-out the home banks in these sectors, perhaps because they can borrow in the capital market directly. Still, the total effect of domestic acquisitions on changes in domestic bank relationships is small, close to a negative 1 percent growth. Foreign acquisitions do not affect the dynamics of banking relationships along this dimension.

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[35]Consistent with the latter argument, Kalemli-Ozcan et al. (2014) show that international ownership diversification explains positive correlation between foreign direct ownership of firms and firm- and region-level output volatility using Orbis data for European countries. The underlying mechanism is that firms owned by foreign firms take more risky but potentially more profitable projects.

Table OA3.1: Acquisitions and change in bank relationships in less financially developed countries

	(1)	(2)	(3)	(4)
Dependent variable	Changes in bank relationships, t-1 to t+1			
Type of banks	Foreign banks		Domestic banks	
Foreign acquisition	-0.024***	-0.015**	0.085***	-0.028*
	(0.006)	(0.006)	(0.017)	(0.016)
Domestic acquisition	0.032***	0.059***	-0.064***	-0.113***
	(0.005)	(0.006)	(0.014)	(0.016)
Foreign acq. × Low FD country		-0.022*		0.334***
		(0.012)		(0.037)
Domestic acq. × Low FD country		-0.091***		0.143***
		(0.010)		(0.029)
Obs.	652,477	652,477	652,477	652,477
R-squared	0.514	0.514	0.520	0.520
Standard controls	✓	✓	✓	✓
Firm and 4 dgt Industry-Year FE	✓	✓	✓	✓
cluster country-sector-year	✓	✓	✓	✓
non-zero events	28960	28960	92761	92761

Note: This table shows OLS regressions of the effect of acquisition on bank relationships. "High fin. dev." is the indicator variable taking the value of one if the target company's country lies below the sample median in terms of the private credit by deposit money banks and other financial institutions over GDP. Standard controls, listed in Table 3, are included but the coefficients are not reported for space considerations. Robust standard errors (clustered by country-sector-year) in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Table A2.1 contains summary statistics. See Section 3 for variable definitions and sources.

Table OA3.2: Acquisitions and change in bank relationships in slow-growth sectors

	(1)	(2)
Dependent variable	Changes in bank relationships, t-1 to t+1	
Type of banks	Foreign banks	Domestic banks
Foreign acquisition	-0.032***	0.066***
	(0.008)	(0.016)
Domestic acquisition	-0.003	0.006
	(0.006)	(0.016)
Slow growth sector	-0.012*	0.078***
	(0.006)	(0.010)
Foreign acq. × Slow growth sector	-0.002	0.035
	(0.012)	(0.027)
Domestic acq. × Slow growth sector	0.058***	-0.098***
	(0.010)	(0.022)
Obs.	531,751	531,751
R-squared	0.503	0.503
Standard controls included	✓	✓
Firm and 4 digit Industry-year FE	✓	✓
cluster country-sector-year	✓	✓

Note: This table shows OLS regressions of the effect of acquisition on bank relation-ships. "Slow growth sector" is the indicator variable taking the value of one if the target company's industry lies below the sample median in terms of the average indus-try growth rate within the EU-15 sample, weighted by country size. Standard controls, listed in Table 3, are included but the coefficients are not reported for space consider-ations. Robust standard errors (clustered by country-sector-year) in parenthesis: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Table A2.1 contains summary statistics. See Section 3 for variable definitions and sources.