The Benefits of Relationship Lending in a Cross-Country Context: A Meta-Analysis

Vlado Kysucky
Rotterdam School of Management, Erasmus University

Lars Norden
Rotterdam School of Management, Erasmus University

Relationship lending helps to reduce asymmetric information, which potentially creates benefits for borrowers. However, empirical evidence is mixed. We conduct a meta-analysis to summarize and explain the heterogeneity in the results using hand-collected information from 101 studies in the U.S., Europe, Asia and Latin America from 1970-2010. We find that strong relationships are generally beneficial for borrowers but lending outcomes differ across the relationships' dimensions. Long-lasting, exclusive and synergy-creating bank relationships are associated with higher credit volume and lower loan rates. These benefits are more likely in the U.S. and in countries where bank competition is high. They are lower the higher the deposits-to-GDP ratio and the higher the importance of SMEs in an economy, suggesting that a higher prevalence of relationship lending does not necessarily come along with higher benefits for borrowers. (*JEL* D82, G3, G20, G21, L14, N20)

Send correspondence to Lars Norden, Rotterdam School of Management, Erasmus University, P.O. Box 1738, 3000 DR Rotterdam, the Netherlands; telephone: +31 10 4082807; fax: +31 10 4089017. E-mail: lnorden@rsm.nl.

The theoretical research suggests that relationship lending has a bright side and a dark side (e.g., Boot 2000). Strong bank-borrower relationships help to reduce asymmetric information between lenders and borrowers, the bright side. But, at the same time, these relationships can create hold-up problems whereby the lender captures the borrower to extract rents, the dark side. Hence, the overall effect of strong bank relationships is a trade-off of costs and benefits between lenders and borrowers through multi-faceted cross-sectional and intertemporal interactions. The empirical evidence on the effects of relationship lending is mixed because of substantial differences in data sources, measurement approaches, dimensions of the relationships, and research methods. In particular, research has neither documented nor systematically analyzed cross-country differences in relationship lending yet. Moreover, it is not clear what underlying country-level factors drive the differences in relationship benefits across economies and in what way these factors affect the outcomes of relationship lending. In this paper, we conduct a meta-analysis to quantitatively summarize the heterogeneous results on relationship lending, and provide country-level explanation for differences in relationship lending outcomes.

The initial research on financial intermediation examined the role of banks in information production (Leland and Pyle 1977; Diamond 1984; Ramakrishnan and Thakor 1984; and Boyd and Prescott 1986). Further theoretical work created the foundations for a more focused examination of bank monitoring (e.g., Sharpe 1990; Diamond 1991; Rajan 1992; Boot and Thakor 2000; and Hauswald and Marquez 2006). Empirical studies on relationship lending have produced evidence that focuses primarily on the benefits that stem from a banking relationship (e.g., Petersen and Rajan 1994; Berger and Udell 1995; Berlin and Mester 1999; and Degryse and Ongena 2005). However, there is no clear consensus on whether, and under which conditions, relationship lending is beneficial for the borrower, the bank, or both.

1

Relationship lending is one of the most important lending technologies (e.g., Berger and Udell 2002; Berger et al. 2005; Bharath et al. 2011) and for many private firms, especially SMEs, it is a key source of external financing (e.g., Petersen and Rajan 1994; De la Torre, Martinez Peria and Schmukler 2010; and Beck, Demirgüç-Kunt, Martinez Peria 2011). Close bank-borrower relationships might create benefits for both sides if the inefficiencies stemming from informational problems are reduced. Hence, the effects of a strong bank-firm relationship are not necessarily a zero-sum game. On the one hand, banks can better assess the risk of default for existing borrowers, while the latter might benefit from improved credit availability and more favorable borrowing terms over time. On the other hand, banks might follow an intertemporal pricing strategy by offering attractive lending terms at the beginning of a relationship to win over a customer and then raising the loan rates and fees on subsequent business. Since the bank observes proprietary information about the borrower and the borrower cannot transfer this private information to another lender, the bank acquires an informational monopoly over the borrower. In particular, a close bank-borrower relationship might create a lock-in effect (hold up, ex-post monopoly power) if the borrower does not have sufficient alternative banking relationships (e.g., Degryse and Ongena 2005), or if the borrower faces high switching costs (e.g., Ioannidou and Ongena 2010; von Thadden 2004; Kim, Kliger, and Vale 2003; Rajan 1992; Sharpe 1990; Greenbaum, Kanatas, and Venezia 1989).

But, borrowers might have incentives for moral hazard in both strong and weak bank relationships. If an important borrower is in financial distress and the relationship with the bank is relatively strong the borrower has incentives to rely on a "too-big-to-fail" effect. Instead of making an effort to improve its financial conditions the borrower might simply gamble on getting more funds from the bank. Or, a relatively risky borrower has incentives to hide private

knowledge about the risk of default in a weak bank relationship, as long as the possibility exists to benefit from lending terms that are more favorable than with that knowledge.

In this paper, we use meta-analytic techniques to summarize and explain the heterogeneity of results in the literature on relationship lending and identify the underlying economic factors that influence the relationship lending outcomes. Meta-analysis has several general advantages over field-evidence based empirical research and is widely used in social sciences (e.g., Hedges and Olkin 1985; Hunter and Schmidt 1990; Lipsey and Wilson 2001; Doucouliagos and Ulubasoglu 2008; and Borenstein, Hedges, Higgins, and Rothstein 2009; examples of applications in finance: Coggin, Fabozzi and Rahman 1993; Djankov and Murrell 2002; van Ewijk, de Groot and Santing 2012). Meta-analysis is particularly well-suited to our setting. The data used in empirical studies on relationship lending ranges from country-specific firm surveys or samples to proprietary credit file data from individual banks. Moreover, there are substantial differences in the measurement approaches, focus on relationship dimensions, and empirical methods. Such heterogeneity in research makes it challenging to compare and generalize the findings in a qualitative literature review. By combining evidence from a large number of different studies meta-analysis allows us to quantify the overall effect of relationship lending with discrete and continuous measures, increase the number of observations from different sources and time periods, reduce the impact of sampling errors within individual studies, and control for the unobserved between-study heterogeneity. Importantly, we identify the sources of disagreement among the studies and introduce new country-level data to test the hypotheses on economic drivers that account for the differences in relationship lending outcomes among the economies.

We develop a multidimensional conceptual framework that combines four dimensions of the strength of bank-borrower relationships (time, distance, exclusivity, and cross-product synergies)

with four lending relationship outcomes (price of credit, volume, collateral, and maturity). First, we summarize the overall effect from the perspective of the borrower. We then decompose the effects into a matrix of relationship dimensions and lending outcomes and study the variation of the benefits. Second, we conduct meta-analytic regressions with country characteristics to explain the heterogeneity in reported results. Our sample consists of 101 studies that report multivariate empirical results on relationship lending and lending outcomes. We carefully hand-collect 2,968 effects based on 4.1 million firm-year observations from 28 countries.

Our study yields the following main sets of results. First, we find that strong bank-borrower relationships are generally beneficial for the borrowers, but the lending outcomes differ across the relationships' dimensions. The results show that 35% of all effects are beneficial for the borrower, 21% are not beneficial, and 44% are not significant. The dimensions of time, exclusivity, and cross-product synergies are associated with lower loan rates. Moreover, borrowers benefit from higher credit volume when they maintain relationships across multiple products and when their relationships last longer with lenders in close proximity. However, borrowers with exclusive relationships are likely to post more collateral. These results suggest that a trade-off exists for banks between costs and benefits across different relationship dimensions and lending terms.

Second, the meta-analytic regression analyses indicate that the likelihood of observing beneficial outcomes for the borrower relates to country-level variables. The benefits for the borrowers from relationship lending are more likely in the United States compared to other countries. This result is not contrary to the widespread view that relationship lending mainly exists in the bank-based financial systems in continental Europe and Japan (e.g., Allen and Gale 2000). We show that the benefits of relationship lending for borrowers - and not the prevalence

4

of relationship lending - are more likely in the United States, which are the biggest market-based financial system in the world. We also find that the benefits for borrowers are higher in countries with high bank competition. We show that more bank competition monotonically increases the likelihood of beneficial effects for borrowers, which is consistent with the models by Boot and Thakor (2000), Hauswald and Marquez (2006), and the more general view that banks use relationship lending as a strategic response to cope with increased levels of competition.

Our study contributes to the banking and finance literature in several ways. This study is the first meta-analysis on relationship lending – an area which has become one of the focal points of modern research in banking and finance. Our analysis extends earlier qualitative literature surveys by quantifying and explaining the effects on relationship lending in a cross-country context. The meta-analysis makes it possible for us to demonstrate that beneficial effects of relationship lending for borrowers are context-dependent. Especially country characteristics, such as bank competition and the level of development of the banking system, influence the research outcomes. We go beyond the findings of studies from single countries that show a u-shaped effect of local or national competition on relationship lending benefits for borrowers (e.g., Degryse and Ongena 2005; Elsas 2005; Presbitero and Zazzaro 2011). Moreover, certain study and methodological characteristics also matter, especially for the precision of the results. Hence, the magnitude and significance of the effects should be considered in relative and not absolute terms, and the context-dependence taken into account. Furthermore, we develop and apply a multidimensional conceptual framework to identify the effects of relationship lending. This framework is based on the prior theoretical and empirical research and allows us to not only examine the overall effects but also to decompose the effects by relationship strength proxies and lending outcomes. Such decomposition has not been done in related studies and helps to identify

which pairs of strength proxies and lending outcomes are most relevant to borrowers. Essentially, our multidimensional framework continues where the pioneering study of Petersen and Rajan (1994) and many of the subsequent empirical studies that focus on selected aspects of relationship lending have stopped.

The remainder of this paper proceeds as follows. In Section 1, we present the conceptual framework, summarize the related literature, and propose a set of hypotheses. In Section 2, we describe our strategy for the literature search and the dataset. In Section 3, we describe the meta-analytic methods and present the empirical results. In Section 4, we report findings from various tests for robustness. Section 5 concludes.

1. Conceptual Framework

1.1 The strength of bank-borrower relationships and lending outcomes

Based on an extensive review of the theoretical and empirical literature on bank-borrower relationships, we consider time, distance, exclusivity, and cross-product synergies as key dimensions of the strength of these relationships. These four dimensions are microeconomic in nature because they depend on the borrower, the bank, and bank-borrower relationship's characteristics. The key lending relationship outcomes are credit volume, loan rates, collateral, and maturity. Borrowers may benefit from close bank relationships if they obtain more credit, lower loan rates, longer loan maturities, or have to pledge less collateral. Figure 1 provides an overview of the multidimensional conceptual framework underpinning our analysis. We briefly summarize the motivation for the dimensions of the framework in the remainder of this section.

(Insert Figure 1 here)

1.2 Time

Relationships are characterized by repeated interactions over time, validation of the interactions, and potential learning (e.g., Boot 2000). One contracting partner can learn from the actions of the other, build up experience, and update the accumulated information as time goes on. The age of the borrower can be considered as a proxy for public information about a firm and thus can indicate its overall transparency. Petersen and Rajan (1994) find that older firms are charged significantly lower interest rates. Cole (1998) shows that credit availability increases with firm age but the increase happens at a diminishing rate. Angelini, Di Salvo, and Ferri (1998) cannot find a significant impact from firm age on the borrowing costs of Italian firms. Harhoff and Körting (1998) and Degryse and Van Cayseele (2000) report that older firms pay lower loan spreads while Lehmann and Neuberger (2001) fail to find an impact from age.

Another time proxy is the duration of the lending relationship, which is more directly related to private information production. The empirical evidence on the influence of the duration on credit availability and lending terms is relatively mixed. For example, Berger and Udell (1995) detect a negative link between duration and loan spreads that implies favorable effects for borrowers from long-lasting lending relationships. However, other studies fail to find a significant relation between the length of the bank-borrower relationship and loan rates in multivariate analyses (e.g., Petersen and Rajan 1994; Blackwell and Winters 1997; Elsas and Krahnen 1998; Harhoff and Körting 1998; Machauer and Weber 1998; and Lehmann and Neuberger 2001). Petersen and Rajan (1994) argue that firm age and not the duration of the bank relationship is the main driver of firms' loan rates. Furthermore, some studies find a positive relation; that is, longer duration is associated with higher loan spreads (e.g., Angelini, Di Salvo,

and Ferri 1998) that might be interpreted as a customer lock-in effect (hold up from the side of the bank). Interestingly, Degryse and Van Cayseele (2000) find no significant impact from the duration on loan rates for main banks, but they do find a significant relation for loans from other banks. Degryse and Van Cayseele draw differentiated conclusions in the sense that scope (larger scope results in lower loan rates) and duration (longer duration results in higher loan rates) of the relationship have opposite effects on loan rates.

The bank also gathers private information over time through personal interaction with the borrower. Scott (2004) uses loan officer turnover as a proxy for the soft information production of banks and provides evidence that it is a better proxy than the duration of the bank-borrower relationship. This finding supports the view that the loan officer is the key point of contact in lending relationships. Uchida, Udell, and Yamori (2012) show that loan officers' activities have a significant relation to the production of soft information at small banks. Howorth and Moro (2012) use the frequency of interactions as a proxy for the intensity of the relationship over the course of its duration. However, there are also trade-offs. Hertzberg, Liberti, and Paravasini (2010) investigate the incentive effects on the credit assessment under a random turnover program for loan officers at a large U.S. bank. They find that the threat of a rotation of loan officers significantly alleviates moral hazard. Their finding shows that loan officers hide bad news about the borrower less frequently and report it more quickly.

1.3 Distance

We use distance in a broad sense and consider not only physical distance but also organizational distance and personal distance. Differences in physical distance between banks and borrowers have important implications for the type of information that banks use for

screening and monitoring. Petersen and Rajan (2002) document that due to technological changes physical distance between small firms and their lenders in the United States grew from a median of 3 miles during 1973 to 1979 to 15 miles during 1990 to 1993. Degryse and Ongena (2005) analyze credit file data from Belgium and find that loan rates decrease with the distance between the borrower and the lending bank, and increase with the distance between the borrower and competing banks. Mistrulli and Casolaro (2008) detect a negative correlation between loan rates and physical distance between the bank headquarters and the borrower. Agarwal and Hauswald (2010) analyze the role of private and soft information and bank-borrower distance in the United States. They provide evidence for a trade-off between the availability and pricing of credit: low distance increases credit availability but also raises the price of credit ceteris paribus. The benefits of low physical distance are explained with the importance of soft information in local lending.

Organizational structure and decision making inside the bank also influence the strength of bank-borrower relationships (e.g., Stein 2002). Alessandrini, Presbitero, and Zazzaro (2009) measure functional distance of local banking markets in Italy as the ratio of local branches, weighted by the physical, economic, and socio-cultural distance that separates them from the locus where their own bank is headquartered, to the total number of local branches. At the firm level, they find that functional distance adversely affects the availability of credit to local firms, and the effect is strongest for small firms in less developed provinces. There is mixed evidence about the effect of organizational distance for the use of collateral. Jimenez, Salas, and Saurina (2009) find for a sample of Spanish firms that collateral requirements are higher when organizational distance is lower. Their measure of the organizational distance is the distance between the bank headquarters that grants the loan and the capital of the province where the

borrower is located. In contrast, Cowling (1999) concludes that the incidence of collateralization is lower when organizational distance is lower.

Greater interactions between the bank and the borrower tend to lead to closer bank-borrower relationships and increased production of soft information. Cole, Goldberg, and White (2004) find that personal relationships are relatively more important for small banks than for large banks. While large banks rely more on hard information, small banks rely more on soft information about the character of the borrower. Berger et al. (2005) find that large banks interact more impersonally with their borrowers, indicating less strong relationships, while loan officers of small banks tend to have more frequent contacts with the borrowers and acquire more soft information (Uchida, Udell, and Watanabe 2008; Uchida, Udell, and Yamori 2012). Degryse and Ongena (2007) conclude that high competition in credit markets and strong (personal) bank-borrower relationships are not necessarily contradictory.

1.4 Exclusivity

Information might be more complete, more accurate and easier to interpret the more exclusive a borrower's relationship is with a bank. Empirical studies show that a higher number of bank relationships is associated with higher loan rates and lower credit availability (e.g., Petersen and Rajan 1994; Machauer and Weber 1998). Firms with a relatively large number of lending relationships tend to be riskier in the sense that leverage and the share of unsecured bank debt are higher (e.g., Jiménez and Saurina 2004). Machauer and Weber (1998) provide evidence that housebanks in Germany obtain more collateral and provide more finance but there is no difference in loan pricing between housebanks and other banks. Harhoff and Körting (1998) conclude that firms with more concentrated borrowing and longer lasting relationships benefit in

terms of collateral requirements, loan rates, and credit availability. Degryse and Van Cayseele (2000) study how measures of the relationship's strength affect price and non-price terms of lending to small Belgian firms. One important result is that firms borrowing from their main banks pay lower loan rates but this advantage decreases the longer the duration of the bank-borrower relationship. Lehmann and Neuberger (2001) examine survey data from Germany and find that the housebank status positively affects credit availability and lending terms. Degryse and Ongena (2005) also find that main banks charge lower loan rates to their borrowers. Elsas (2005) investigates the determinants of the housebank status of SME borrowers in Germany. The main finding is that proxies for private information production significantly increase the likelihood of being a housebank.

1.5 Cross-product synergies

The scale and scope of the financial services provided by the bank also influences the strength of the bank-borrower relationships. A key source of informational synergies for commercial banks might be the simultaneous provision of lending, payment services, and deposit taking (e.g., Nakamura 1993; Mester, Nakamura, and Renault 2007; Norden and Weber 2010; and Kano, Uchida, Udell, and Watanabe 2011). For example, Norden and Weber (2010) provide evidence based on a large sample of bank-borrower relationships in Germany that banks' proprietary information on borrowers' credit line usage and checking account activity significantly improves default predictions. In addition, they show that early warning indications from borrowers' account activity have a significant effect on banks' behavior (e.g., loan pricing, limit changes, and account closes). Furthermore, Kirschenmann and Norden (2012) develop an index of asymmetric information that they base on the duration of the bank-borrower relationship and on

the bank's access to private information from the borrower's checking accounts. The index has a significant relation to the maturity of new loans (borrowing under low asymmetric information exhibits significantly longer loan maturities), which is consistent with signaling models for the borrowers' quality (e.g., Flannery 1986). Chakraborty and Hu (2006) find that collateral requirements decrease as the number of financial services provided by the lender increases. Santikian (2011) analyzes the influence of a borrower's profit appeal to the bank on the borrower's price of credit and credit availability. She finds that borrowers who purchase profitable non-credit products and who recommend other profitable clients are rewarded with lower loan rates and larger loan volumes. These findings suggest that strong bank-firm relationships may not only create informational synergies but also profit synergies for banks.

2. Hypotheses

Relationship lending is one of the most important lending technologies, especially in small business finance. We therefore surmise that relationship lending creates benefits for borrowers. However, the banking and finance literature has provided rather mixed evidence on the bright side and dark side of relationship lending (Boot 2000; Elyasiani and Goldberg 2004; Degryse and Ongena 2008). The evidence is based on heterogeneous data sources such as country-specific surveys, samples and/or proprietary datasets from individual banks. Thus, in a first step we test whether, and under which conditions, the evidence supports the view that the bright side of relationship lending prevails over its dark side.

Hypothesis 1 (H1): *Strong bank-borrower relationships are associated with beneficial lending outcomes for the borrower.*

We test this hypothesis by using discrete measures (significantly positive, significantly negative, and nonsignificant effects), as well as continuous measures (one-tail p-values and partial correlations between the relationship's strength and lending outcomes). We can unambiguously interpret the meaning of the significant effects but we cannot for the nonsignificant results. The lack of significance might be due to a sampling error in the study, the absence of the effect in the population, or other sources of heterogeneity that require special attention in our analysis. The meta-analysis helps us to minimize this potential type-II error and to increase the accuracy of the overall estimate.

In a second step, we test two hypotheses about factors that help to explain the heterogeneity in the results summarized in the first step. Berger and Udell (2002, 2006) and Degryse and Ongena (2008) argue that the lending technology together with the financial institution's structure and the lending infrastructure affect the credit availability and lending terms for firms in a country. Haselmann, Pistor and Vig (2010) provide evidence that changes in collateral and bankruptcy laws have a direct impact on bank lending behavior in transition economies. However, the literature has not systematically analyzed whether and how country-level differences affect the outcomes of relationship lending and in what way. Therefore, we consider various country characteristics that relate to the above categories to explain the heterogeneity in related studies.

We expect that the beneficial effects of relationship lending are more likely in developed countries. We note that that the distinction between developing versus developed countries also relates to various characteristics of the lending infrastructure. On the one hand, informational asymmetries are more severe in developing countries because of lower transparency, less

disclosure standards, and enforcement problems. As a result, higher adverse-selection problems lead to a higher probability of the hold-up problem. On the other hand, the possibility exists that close bank-borrower relationships are more important in developing countries because they can serve as an alternative (informal) mechanism for information production. Furthermore, more competition in the banking sector creates incentives for banks to use relationship lending as a device to differentiate (and shield) themselves from their competitors (Boot and Thakor 2000; Carbo-Valverde, Rodriguez-Fernandez, and Udell 2009; Presbitero and Zazzaro 2011). The perceived level of corruption in a country might also affect the functioning of relationship lending. Corruption can distort the allocative efficiency in an economy, but it could also lead to private benefits for certain borrowers (e.g., small businesses). We surmise that relationships can help to reduce allocative distortions and improve information production in the face of corruption. Moreover, some authors argue that the level of inflation has a positive relation with inflation uncertainty (e.g., Holland 1995). High inflation uncertainty in turn translates into a high nominal interest-rate premium (Kandel, Ofer, and Sarig 1996). Borrowers in inflationary environments can potentially obtain insurance against these uncertainties through strong lending relationships. Therefore, we expect that the benefits have a positive relation with the level of inflation. In addition, we test the effects of banking system development. In bank-based systems lenders enjoy relatively more inelastic funding liquidity from depositors, which gives the banks greater inter-temporal pricing freedom (Berlin and Mester 1999), and face less competition from capital markets. Less competition from capital markets enable banks to commit more resources to relationships (Boot and Thakor 2000). Therefore, we expect that the bright side of relationship lending should be more likely to be present in countries with bank-based financial systems, especially in Europe (excluding the UK) and in Japan (e.g., Allen and Gale 2000; Krahnen and

14

Schmidt 2004; King and Levine 1993). We also expect that the cost efficiency in the banking sector has a negative relation to the likelihood of beneficial effects for the borrower. The underlying reasoning is that relationship lending requires banks to develop special and costly skills in (soft) information production that make this lending technology profitable from an intertemporal perspective (Boot 2000).

Hypothesis 2 (H2): *The likelihood of beneficial effects for the borrower from a lending relationship is greater in developing countries (H2a), high bank competition (H2b), high level of corruption (H2c), high inflation (H2d), and bank-based financial systems (H2e). But the likelihood is smaller in countries with lower cost efficiency in the banking sector (H2f).*

3. Data

To identify the studies that report empirical results on the link between the strength of the lending relationships and their lending outcomes, we use two search strategies. First, we look for the terms "relationship lending" and "relationship banking" in the following six databases: ISI Web of Knowledge, Scopus, ScienceDirect, JSTOR, ABI/Inform, and SSRN.[1] Specifically, we search in the fields "title", "abstract", "keywords", or their equivalents. This strategy results in a total of 850 matches as of May 2012. Second, as common in meta-analyses, we perform a reverse lookup of references in the literature survey articles on relationship lending by Boot (2000), Elyasiani and Goldberg (2004), and Degryse and Ongena (2008). From the reverse lookup we obtain an additional 438 matches. After eliminating missing records, both strategies

---

[1] These databases comprise published journal articles (ISI Web of Knowledge, Scopus, ScienceDirect and JSTOR), working papers (SSRN), or both (ABI/Inform). In the ABI/Inform search, we add the databases Econlit and Banking Information Source.

yield a raw sample of 1,258 studies. We also search the above databases for more recent or published versions of all unpublished papers and make replacements wherever appropriate.

We then apply several filter rules to arrive at the final sample. We exclude all papers with no empirical results and those with no information on relationship lending and lending outcomes. Next, we eliminate studies that focus on retail lending, historical studies with data prior to the year 1970, and studies not written in English. We further perform a full-text search for "relationship lending" and "relationship banking" in the additional studies obtained from the reverse lookup and retain those that produce at least one match. In the next step, we analyze the empirical strategy of all remaining papers and keep those that meet all of the following criteria: (i) empirical results contain at least one multivariate regression model with one of the lending terms as the dependent variable and a proxy for the lending relationship's strength as the explanatory variable, (ii) the relationship strength proxies and lending outcomes fall into one of the above designated categories (as shown in Figure 1), and (iii) information about the size of the effect (i.e., the regression coefficient that indicates the relation between the dependent and independent variable) and its statistical significance are available, complete, and comparable within each category. Applying these filters yields a final sample of 101 studies, consisting of 75 published and 26 unpublished papers. Table A1 of the appendix shows a list of all studies included in our analysis.

For each study, we manually collect information on the link between relationship lending and loan terms from all of the tables in a study, including the appendices. This data collection effort leads to a sample of 2,968 estimation results (hereafter "effects"). The basis of the selected studies is 4.1 million firm-period observations. Furthermore, we collect key characteristics of the selected studies and country-level variables from further sources (e.g., ISI Journal Citations

Reports, Web of Science, The World Bank Country Indicators, etc.). Table A2 of the appendix shows a complete list of the variables. We calculate country-level variables for each study, country, and sampling window as equally weighted averages of those country-year observations that are available within the sample period of the study. Table 1 reports the summary statistics for our sample.

(Insert Table 1 here)

The paper with the highest number of citations is the pioneering study of Petersen and Rajan (1994) published in the *Journal of Finance* with 563 citations. Next are Berger and Udell (1995) published in the *Journal of Business* with 393 citations, and Uzzi (1999) published in the *American Sociological Review* with 352 citations. Of the published papers, 21 out of the 75 appear in three journals that focus on banking research: the *Journal of Banking and Finance*; the *Journal of Money, Credit, and Banking*; and the *Journal of Financial Intermediation*. The remaining articles come mainly from general finance, economics, and business journals. The three most frequent non-banking journals in our sample are *Small Business Economics* (8 studies), the *Review of Financial Studies* (5), and the *Journal of Finance* (4). The median journal impact factor around the publication year is 1.4. A total of 26 unpublished studies represent working papers from SSRN or conference proceedings reported in Scopus.

The data set comprises a sample period that ranges from 1970 to 2010 and centers on the year 1997. The median sampling year of the earliest study is 1978 and it is 2008 for the most recent study. Geographically, the data set spans Europe (43 studies), the United States (35), Asia (18), and Latin America (5). After the United States, the most frequent countries are Italy (12),

followed by Germany (11), and Japan (9). Only 14 papers come from emerging countries. Regarding the method of data collection, 46 papers use firm surveys and 23 use bank data sets. The rest use a combination of both or other third-party databases. Over half of the studies from the United States (20 out of 35) make use of the datasets from the National Survey of Small Business Finances ((N)SSBF) that leads to an overlap in our sample that we analyze in a separate test. There are around 60,000 unique firms in the U.S. studies and 161,000 unique firms in studies from all other regions.

4. Empirical Analysis

4.1 The structure of the analysis and methods

Our analysis of relationship lending consists of two main steps. First, we test Hypothesis 1 by examining the overall direction and significance of the effects with one discrete and two continuous measures. Second, we test Hypothesis 2 with meta-regressions to estimate the influence of country-level characteristics on the benefits of relationship lending.

The term "effect" in our analysis refers to the significance and the direction of a regression coefficient that indicates the influence of one of the relationship strength proxies on one of the lending outcome variables. We calculate three measures (one discrete and two continuous) of effect sizes and derive the overall estimates of the true effect across all studies. The first measure is a discrete variable that classifies reported effects from the studies into positive, negative, and nonsignificant ones at the 10% significance level. The second measure is the one-tail p-value as a continuous interpretation of the direction and the significance of the effect size. The values of the one-tail p-values range from zero to one where values approaching zero are significantly

18

unfavorable to the borrower, but values approaching one are significantly favorable[2]. The advantage of using the continuous measure is that the aggregation of *p*-values incorporates the impact of non-significant effects on the overall outcome. We confirm that discrete and continuous measures are consistently closely related (Spearman's rank correlation 0.94). Our third measure is the continuous Fisher's *z*-score which is a partial correlation corrected for skewness. The partial correlation is a standard input in meta-analysis techniques (e.g., Djankov and Murrell 2002). This correlation is comparable across studies and accounts for the effect of other explanatory variables included in the regression models. We obtain partial correlations from regression statistics followed the procedure by Greene (2008, Ch. 3). Based on these three measures we retain the information on the relative significance, the direction of the effects, and the magnitude of the strength of the association. Because all three indicators are unit-free, we can meta-analyze the effects in a consistent and comparable way across a heterogeneous set of studies. In order to obtain as precise estimates as possible, we follow Bijmolt and Pieters (2001) and use a complete set of effects of all studies in our sample. These effects are not independent within studies. We account for this dependence in each of the estimation method described below.

To test Hypothesis 1 we estimate the overall effect of each combination of the lending relationship's strength and lending outcome proxies. We count the discrete number of significantly beneficial outcomes, significantly non-beneficial outcomes, and nonsignificant outcomes and report the relative frequencies for each group. We test the difference between

---

[2] The conversion formula from 2-tail p-value to 1-tail p-value is as follows. If the effect is in the direction of the hypothesis that the relationship is beneficial to the borrower (i.e., the relationship's strength has an association with lower rates, greater credit availability, lower collateral requirements, or longer maturity, then the one-tail p-value is defined as p1=(p2/2). If the effect is in the opposite direction, then p1=1-(p2/2). In this calculation p1 is the one-tail p-value and p2 is the two-tail p-value reported in papers or derived from significance statistics.

beneficial and non-beneficial outcomes with a binomial sign test with the 50% probability of the occurrence of each outcome. Next, we apply Edgington's (1972) method to calculate the overall outcome as one-tail p-value that indicates the pooled estimate of the significance and the direction of the overall true effect. Finally, we use random-effects Hedges-Olkin meta-analytic (HOMA) procedures to calculate meta-analytic mean correlations from the Fisher's z-scores (Hedges and Olkin (1985), Lipsey and Wilson (2001) Borenstein, Hedges, Higgins, and Rothstein 2009). In addition, the HOMA procedure takes into account the precision of the estimates by weighting each input effect by the inverse of its squared standard errors (Hedges and Olkin 1985). The same weighting principle is used for estimating the statistical significance of the overall effect. For expositional reasons we convert the overall Fisher's z-score back to a partial correlation to facilitate the interpretation of the results. This part of our analysis represents a first attempt to document the heterogeneity in this field of research, especially in an international context, and to improve our understanding of the bright and the dark side of relationship lending. By combining all of the effects, we reduce the probability of a type-II error and improve the accuracy of the significance estimation for the overall effect. We report the effects of any combination of the lending relationship's strength and lending outcome variables to compare diverse results from heterogeneous studies and to estimate the direction and the magnitude of the overall effect.

We test Hypothesis 2 by meta-regressions to estimate the influence of country characteristics on the reported results in the studies. We estimate three sets of models. In the first set, we estimate a binary logit model for all significant effects with dependent variable indicating whether the effect is significant at 10% level. In the second set, we estimate a tobit model using all of the effects where the dependent variable is a continuous one-tail p-value. For both the logit

and tobit specifications we use pooled data and panel data regressions with random effects. Because multiple observations within a study are not independent, in the pooled regression models we use robust standard errors clustered by studies, and in random-effects models we group observations into panels by studies. In the third set, we estimate meta-analytic regressions where the dependent variable is Fisher's z-score. These meta-analytic regressions extend the weighted least square regression by incorporating the between-study variance of the observations. The weighting scheme is based on the differences in precision of the individual input effects. As in the case of the overall effect estimation, we use a more conservative random-effects model that accounts for the unobserved between-study heterogeneity. In addition, we perform robust variance regressions with estimates of the dependent effect size. This method is based on Hedges, Tipton, and Johnson (2010) and provides a robust method for estimating the meta-analytic regressions where effect sizes might be correlated. Because we include in our analysis all reported effects, this method addresses a potential bias arising from correlated estimates from within the studies.

4.2 Direction and significance of the effects

To assess the direction and significance of the overall effect of the lending relationships, we split the full sample of 2,968 effects from the 101 studies into a matrix of eight categories of proxies for the relationship's strength and four categories of lending outcomes. We then calculate the relative frequencies and the overall continuous effect for each pairwise combination of categories. Panel A of Table 2 reports the results based on discrete effects, and Panel B reports the continuous effect.

(Insert Table 2 here)

Panel A of Table 2 shows that there are both costs and benefits for close bank-borrower relationships, but the number of beneficial outcomes for the borrower prevails. Of the significant effects (i.e., leaving the nonsignificant effects aside for a moment), 62% are beneficial for the borrower, while 38% are not beneficial for the borrower. The difference between the beneficial and non-beneficial outcomes is significant at the 1% level, which is consistent with Hypothesis 1. Decomposing the effects into lending relationship proxies and lending outcome proxies, we find that the categories of time and cross-product synergies have a significant association with beneficial effects. Longer and synergy-creating bank relationships are likely to result in higher credit volumes and lower loan rates. Stated differently, borrowers obtain more credit and/or a lower loan rate if they develop long-standing relationships with a lender that provides the borrower with multiple financial services. Moreover, firms with longer relationships are likely to pledge less collateral. These findings indicate that the benefits of relationship lending are of a more general nature since they exist for multiple combinations of lending outcomes and relationship strength proxies. For comparison, the empirical study by Petersen and Rajan (1994) suggests that strong bank relationships primarily help to increase the availability of financing to firms but have little impact on the financing costs. Their explanations why quantity effects matter more than price effects are plausible and may hold in the U.S., but the cross-country evidence points at more general effects. However, the table shows a potential hold-up problem whereby higher exclusivity is related to more collateral. This problem means that borrowers are either willing to pledge more collateral to an exclusive lender as a signaling device, or lenders accumulate collateral to capture their clients (e.g., Elsas and Krahnen 1998; Machauer and

Weber 1998). Borrowers in close proximity to their bank are likely to obtain larger credit volume. The effects on loan maturity are rather mixed and based on a small number of observations that does not allow us to identify a systematic pattern. Panel B of Table 2 shows the continuous effects by categories. The continuous effects allow for a more refined measurement of the statistical significance of the effects since we now consider all effects. We find that the heterogeneity across the categories and the direction of the effects is similar to the results shown in Panel A and consistent with Hypothesis 1.

Figure 2 shows the full distribution of the direction and statistical significance of the continuous effects (one-tail p-values). We observe that the effects cluster near zero (non-beneficial effects for the borrower) and one (beneficial effects for the borrower), but the frequency is significantly larger near one, which indicates that benefits for the borrower prevail.

(Insert Figure 2 here)

Overall, our first set of results suggests that strong bank-borrower relationships are beneficial for the borrowers as suggested by Hypothesis 1, but the lending outcomes differ across the relationships' dimensions. The relationship's benefits mainly stem from repeated interactions over time and from cross-selling of multiple financial services from the same lender. These benefits are realized mainly through higher credit availability and lower loan rates. Borrowing exclusivity has an association with mixed beneficial and non-beneficial outcomes for the borrowers. The potential evidence of a hold-up problem relates to the higher collateral requirements that are used in more exclusive relationships. The evidence of relationship lending effects on loan maturity remains unclear.

4.3 Country-level analysis and meta-regressions

We continue with our test of Hypothesis 2 that postulates that country characteristics of the study sample influence the likelihood of observing significantly beneficial effects for the borrower. Table 3 reports the distribution of relationship lending outcomes across country-level variables. We split the data sample by median value of each country variable and calculate the mean likelihood of observing the beneficial relationship outcomes for the borrowers. We observe that across all relationship dimensions the beneficial outcomes are more likely by 33% in countries with high bank competition. In particular, when the competition is high 76% of all outcomes are beneficial for the borrower. For comparison, when the competition is low, only 43% of outcomes are beneficial. This finding is consistent across all relationship dimensions. We also note that exclusivity appears to be beneficial in non-bank-based financial systems.

(Insert Table 3 here)

In Figure 3 we present a scatterplot of the mean values of relationship lending benefits for borrowers and bank competition by country.

(Insert Figure 3 here)

We find a significantly positive and robust linear relationship between the two variables. A simple bivariate cross-sectional OLS regression yields a slope coefficient of 0.79 (p-value<0.001 based on robust standard errors) and an R^2 of 37%. The largest benefits accrue to borrowers in

Argentina, the US, and Taiwan where the bank competition is highest. The smallest borrower benefits are observed in Europe, especially in countries with low levels of bank competition. Interestingly, although most European countries are characterized by bank-based financial systems with a large fraction of small business borrowers who rely on bank relationships to obtain external finance, our analysis indicates that the prevalence of relationship lending does not necessarily come along with benefits for borrowers.

To test the influence of country-level variables on the likelihood of relationship lending benefits for borrowers more formally we now turn to multivariate meta-regressions. Model (1) in Panel A of Table 4 shows the results of the pooled logit regression estimations. The dependent variable equals one when the lending outcome is beneficial for the borrower and zero otherwise.

(Insert Table 4 here)

We find that the benefits of relationship lending are more likely to occur in countries with more competitive banking markets (consistent with Hypothesis 2b), lower corruption (not consistent with Hypothesis 2c), and with a lower level of bank deposits over GDP (not consistent with Hypothesis 2e). The most salient result, both in magnitude and significance, is the positive effect of bank competition. This finding is in line with the argument that banks use relationships to retain customers in the face of competition from other banks (e.g., Boot and Thakor 2000; and Degryse and Ongena 2005). Banks exert effort in borrower-specific and/or industry-specific information production and reward their relationship borrowers with more credit and/or better lending terms to prevent them from switching to competitors. Our result is also consistent with the evidence provided by Black and Strahan (2002) on the impact of policy changes fostering

competition in the U.S. banking sector on new incorporations and entrepreneurial activity. At a first glance, this finding seems to contradict studies that show that borrowers can benefit from limited competition by having exclusive bank relationships (e.g., Petersen and Rajan 1994). However, we believe that there is no contradiction since we measure competition at the level of a country's banking system in cross-country context (and we later show that this effect remains robust if we use alternative measures) but not at the individual firm level. In our test of Hypothesis 1 we have already shown that more exclusive bank relationships exhibit lower loan rates and a higher credit volume. Most important, we argue that a firm can maintain a value-creating exclusive relationship with a lender in a country with high bank competition. The meta-regression result on competition from Table 4 together with Figure 3 indicate a monotonic positive relationship, while single-country studies have found u-shaped effects of local or national competition on relationship lending (e.g., Elsas 2005; Degryse and Ongena 2008; Presbitero and Zazzaro 2011). We believe that both effects may coexist and can be reconciled – but at different levels of aggregation.

We further find that the bank deposits over GDP are negatively related to borrower benefits. This suggests that banks' advantages from deposit funding liquidity do not necessarily translate into borrower benefits as hypothesized (Hypothesis 2e). We note that the relative size of the deposits and bank competition are distinct and exert an opposite impact on borrower benefits. In our sample the correlation between the two variables is 0.10. We do not find evidence that relationship benefits for borrowers consistently differ in developing countries (Hypothesis 2a), or in countries with higher level of inflation (Hypothesis 2d). Similarly, the cost-income ratio of banks is not significantly related to the relationship outcomes (Hypothesis 2f).

In Model (2), we estimate the same specification with the random-effects estimator and show that the previous results hold at the 10% significance level after we account for the unobserved heterogeneity. We obtain qualitatively similar results in Models (3) and (4) when we repeat the previous analyses using the tobit estimators with the continuous dependent variable (one-tail p-value), and in Models (5) and (6) that use the meta-analytic regressions. The influence of bank deposits over GDP and bank competition remains robust across all specifications.

In Panel B of Table 4, we investigate whether and how the relationship benefits vary by country and region in a multivariate model. Figure 3 indicated substantial cross-country variation in the benefits of relationship lending for borrowers. On the one hand, we expect the benefits to be higher in continental Europe and Japan where financial systems are mostly bank-based and are more concentrated, as postulated in Hypothesis 2e. On the other hand, the U.S. banking system is still rather fragmented and is characterized by a large number of very small banks who provide relationship lending to small businesses. Interestingly, we find that the relationship lending benefits for borrowers are stronger in the United States than in Europe, Asia, and Latin America, which is not in line with Hypothesis 2e. We note that this result does not indicate that relationship lending is less prevalent in these regions; it rather indicates that the benefits of relationship lending for borrowers are ceteris paribus lower in these regions. This is likely due to higher bank competition in the United States, especially in the small business segment. Moreover, lending to small businesses in the U.S. comes from a large number of community banks, relatively small commercial banks, and credit unions with the mandate to serve local businesses and/or their members. Decomposing the effects by countries, we find that in most countries borrowers indeed enjoy fewer benefits from relationship lending relative to the United States. Only in Argentina, Bolivia, Germany, and multi-country studies are the outcomes not

significantly different from the United States. We also confirm these findings in a model with dummies for the legal origin of the countries (categories: English, French, German, Scandinavian, and Socialist with English as the reference category; see Djankov, McLiesh, and Shleifer 2007; La Porta et al. 1999). The regional results hold robustly at the 1% significance level across the specifications.

The benefits of relationship lending might be time varying. Specifically, theory predicts that relationships can serve as liquidity insurance in times of distress. However, evidence from financial crises suggests that banks tend to contract their credit supply. Time-varying costs and benefits could also be due to changes in country-level variables such as competition, regulation, cross-border consolidations, technology, etc. In Figure 4 we plot the relationship lending benefits for borrowers measured as the mean of the 1-tail p-values (solid lines) and the mean of bank competition (broken lines) for the US and Europe over time.

(Insert Figure 4)

We find that the relationship benefits for borrowers in the US are, although more volatile than in Europe, always higher than those for borrowers in Europe except in one year (1991). Moreover, bank competition is consistently lower in the Europe than in the US. These results indicate that the average effects shown in Figure 3 and Table 4 are robust in a time-series analysis.

Given the substantial variation of relationship benefits across countries, especially between the US and Europe, we carry out one more test that complements our earlier test of Hypotheses H2e. Specifically, we analyze whether there is a link between the prevalence of relationship

28

lending and its benefits for borrowers. For this purpose, we investigate whether and how the importance of SMEs, considered as lower bound proxy for the prevalence of relationship lending in a country and measured as their contribution to total employment, relates to the relationship lending benefits and bank competition. Figure 5 displays the results for the dominant countries in our sample.

(Insert Figure 5)

It turns out that relationship lending benefits and bank competition in the US are highest and the importance of SMEs is lowest, while the opposite is found for the other countries. In Germany, France, Italy and Japan SMEs are very important, contributing to 65%-75% of total employment, while the relationship lending benefits and bank competition are substantially lower. This analysis helps to understand our earlier meta-regression results and provides direct evidence that the prevalence of relationship lending does not automatically come along with relationship lending benefits for borrowers.

4.4 Further evidence from the meta-regression analyses

We examine a possible ambiguity in the overall direction of the relationship benefits in Table 5. The overall positive coefficient might indicate a true positive relation for the explanatory variable with the beneficial outcome. However, the overall positive coefficient might also indicate a negative relationship for the explanatory variable with the non-beneficial outcome. In other words, the overall beneficial effect might be due to the straight benefits for the borrower, or due to the absence of non-beneficial effects. To investigate this issue, we decompose the effects

into three discrete outcomes: one (the relationship effect is significant and beneficial for the borrower), zero (the relationship effect is nonsignificant), and minus one (the relationship effect is significant and non-beneficial for the borrower). Table 5 reports the results of the multinomial logit regression estimation.

(Insert Table 5 here)

In Panel A of Table 5, we show that bank competition is directly linked to borrower benefits, which is again in line with Hypothesis 2b and the pattern displayed in Figure 3. We further find that the corruption index has a negative relation to non-benefits, which is consistent with the results of Table 4, Model I. Hence, we can interpret the overall result in a more subtle way: countries with lower levels of corruption (higher value of corruption index) are less likely to observe non-beneficial effects from relationship lending. These effects do not mean that lower corruption has an association with higher benefits. Instead, the lower level of corruption merely implies the absence of adverse effects for the borrowers. We get similar results for the ratio of bank deposits over GDP. This ratio has a negative relation to borrower benefits, but not to non-benefits. Hence, the overall negative effect on bank-system development. In Panel B of Table 5, we find that coefficients on the region dummy variables are significant in both directions even though the overall coefficient is negative. This negative coefficient means that relationship borrowers outside of the United States are likely to observe both fewer benefits and more adverse effects relative to the borrowers in the United States. This finding confirms that our earlier evidence against Hypothesis 2e is robust.

As reported above, 44% of all of the findings on relationship lending in the primary studies are not statistically significant. Such a large portion raises the question about the likelihood of a type-II error in the primary studies. This problem arises because in the primary studies we cannot distinguish whether a nonsignificant result is due to the absence of the effect in the population; or because of insufficient evidence to reject the null hypothesis, especially when the sample size is small. Therefore, we estimate the influence of study characteristics on the likelihood of observing a nonsignificant result. Table 6 reports the results.

(Insert Table 6 here)

As expected, the impact of the number of observations is negative and highly significant across all models. In unreported regression analyses with the continuous effect measure as the dependent variable, we obtain similar results. Therefore, the large number of nonsignificant effects in our sample is potentially due to the sampling error, rather than the nonexistence of the effect. This result confirms the importance of accounting for the precision of the estimates in all of the specifications.

We further investigate whether study characteristics significantly relate to the likelihood of beneficial effects for borrowers. The consideration of study characteristics in meta-analysis is a standard approach and has been applied in various contexts in the social sciences (e.g., Hedges and Olkin 1985; Lipsey and Wilson 2001; and Borenstein, Hedges, Higgins, and Rothstein 2009). Potentially relevant study characteristics relate to the quality, scale, and scope of research (top researchers/journals vs. others, size of the data sets), research specialization (general finance vs. banking research), and research paradigms and biases (e.g., the tendency to publish significant

results; confirmation bias, etc.). To fully understand the context dependency of relationship lending it is important to take potential effects of study characteristics into account and investigate whether they exist in addition to the hypothetical effects due to country characteristics. We also control for sample sizes and the heterogeneity in empirical methods.

(Insert Table 7 here)

We find that studies published in banking journals are more likely to report the beneficial effects from relationship lending. This result remains significant in all of the specifications and after controlling for country effects. In addition, we find that the author's affiliation ranking has a significant and negative relation to the likelihood of reporting beneficial results for the borrower in four of the six models. There is no clear evidence on the influence of the journal's impact factor. We also do not observe that papers with relationship lending as the primary focus systematically report beneficial effects for borrowers. In additional analyses we control for the empirical methods used in the studies. We do not find a significant influence of methods and confirm the above results.

5. Robustness Tests

We conduct several additional tests to study the robustness of our results and their sensitivity to variable definitions, empirical methods, and subsamples. To conserve space we briefly summarize the results in the remainder; the tables of all robustness tests are available from the authors on request.

First, we examine how sensitive are our results to the selection of country-level variables. We reestimate the models with alternative definitions for each proxy of interest as follows: (i) country development status: GDP per capita; (ii) Bank-system development: private credit by deposit money banks over GDP; (iii) bank competition: inverse of the Herfindahl index for the five largest banks; (iv) corruption: Transparency International index; and (v) bank efficiency: bank overhead costs over total assets. All our findings are similar except for the bank overhead costs that have a significant and positive relation to the beneficial effects of relationship lending. Interestingly, the result for bank overhead costs across all models dominates the effect of other country variables, including bank competition. This result is due to the collinearity between overhead costs and competition that indicates banks tend to spend more for overhead, such as salaries for the management and all other employees and information technology costs, when bank competition is high. In return, these expenditures, which might reflect improved information production and management, translate into higher benefits for borrowers.

Second, to assess the effects separately by lending outcomes, we split the sample into effects that measure the price of credit and credit availability. We do not estimate separate models for collateral and maturity because the number of observations is relatively small for these two categories. The results are qualitatively similar for both outcomes and consistent with the previous findings. The bank competition and regions remain the most important explanatory variables. While the relationship borrowers in Europe pay higher loan rates and obtain less credit compared to the borrowers in the United States, the difference is less pronounced in the rest of the world. There is no significant difference in loan rates between the United States and the other regions.

Third, in our previous analyses we include all of the effects from all of the studies (2,968 effects, i.e., on average around 30 effects per study). These effects introduce a stochastic dependence among the observations. We already addressed this issue by using alternative econometric and meta-analytic techniques. As an additional check, we conduct the same analyses using only one observation per study per category combination. We make the simplifying assumption that within each study the most representative findings are reported first and denote these findings as "best set." We repeat all empirical analyses using only the "best set" sample. While we lose some significance due to a lower number of observations the main results remain qualitatively the same.

Fourth, several studies from the United States rely on the same data source: the (N)SSBF. The overlapping use of the same data might overweight the results from this source and bias the outcomes accordingly. To address this issue, we re-estimate the models with an indicator variable that shows whether the study uses the (N)SSBF sample. Alternatively, we add separate dummies for each of the (N)SSBF survey waves (1987, 1993, 1998, and 2003). None of these measures influences our main results. When we exclude the U.S. data from our sample, we observe that the influence of bank competition remains significant but becomes slightly weaker.

Fifth, as already discussed in Section 4.3 (see Figure 4) the benefits of relationship lending tend to be time varying. Hence, we use year dummies to control for time effects, crises effects, and GDP growth. In addition, we use an indicator for those effects that are explicitly designated by the original study as related to a crisis. We do not find any material influence of the time dummies, and the crisis dummies are also not significant.

Sixth, we re-estimate all of the meta-analytic regression models including the 32 multiplicative controls for the relationship-outcome combinations (eight relationship proxies

times four lending outcomes), instead of the 12 additive controls (eight relationship proxies plus four lending outcomes), and we obtain similar results.

6. Conclusion

In this paper, we conduct a meta-analysis to summarize and explain the heterogeneity of the results in the literature on relationship lending in a cross-country context. We develop a multidimensional conceptual framework to measure the strength of lending relationships and their lending outcomes in a differentiated manner. Our analysis is based on a hand-collected sample of 2,968 effects (4.1 non-overlapping firm-year observations) from 101 studies of bank-borrower relationships from the United States, Europe, Asia, and Latin America during 1970-2010.

We find that strong relationships are generally beneficial for the borrowers, but the lending outcomes differ across the relationships' dimensions. The dimensions of time, exclusivity, and cross-product synergies are associated with lower loan rates. Borrowers also benefit from higher credit volume when they maintain relationships across multiple products and when their relationships last longer with lenders in close proximity. However, borrowers with exclusive relationships are likely to post more collateral. Our results suggest that the beneficial effects of relationship lending go beyond an improvement in credit availability to firms as suggested by Petersen and Rajan (1994), and that banks trade-off the costs and benefits across different relationship dimensions and lending terms.

The meta-regressions show that the likelihood of beneficial effects for the borrowers is context-dependent, i.e., it has a significant relation to country and study characteristics. The benefits of relationship lending for the borrowers are more likely when bank competition is high.

We document a strong and positive monotonic link between bank competition and relationship lending benefits for borrowers. We further find that the benefits for the borrowers are more likely in the United States compared to the other regions. We document that the prevalence of relationship lending per se, as found in the bank-based financial systems in Europe and Japan with high bank deposits-to-GDP ratios and a large fraction of SME borrowers, does not necessarily come along with benefits for these borrowers.

Our meta-analysis represents a first attempt to provide a systematic and quantitative assessment of the evidence on relationship lending in a cross-country context that extends and complements earlier literature. Our findings also point at several interesting avenues for future research. For example, we do not yet fully understand the role of supply and demand, including the impact of bargaining power on outcomes of bank-firm relationships. Therefore, to assess the overall value of relationship lending, it is important to understand the conditions under which relationship lending emerges along with the benefits for the lenders and/or the borrowers. Moreover, the global financial crisis of 2007-2009 gives rise to the question whether and how relationship lending amplifies or alleviates the transmission of shocks to banks on individual firms (and vice versa) and how this mechanism varies between countries. Evidence on this question has important policy implications for financial system architecture, financial stability and the real economy.

Appendix

Table A1

Studies included in the meta-analysis

Author(s)	Title	Year	Publication
Agarwal, R., and J. A. Elston	Bank–firm relationships, financing and firm performance in Germany	2001	Economics Letters
Agarwal, S., and R. Hauswald	The Choice between arm's-length and relationship debt: Evidence from eLoans	2008	
Agarwal, S., and R. Hauswald	Distance and private information in lending	2010	Review of Financial Studies
Alem, M.	Insurance motives in lending relationships: Evidence from Argentina	2003	
Alessandrini, P., A. F. Presbitero, and A. Zazzaro	Banks, distances and firms' financing constraints	2009	Review of Finance
Alessandrini, P., A. F. Presbitero, and A. Zazzaro	Global banking and local markets: A national perspective	2009	Cambridge Journal of Regions, Economy and Society
Angelini, P., R. Di Salvo, and G. Ferri	Availability and cost of credit for small businesses: Customer relationships and credit cooperatives	1998	Journal of Banking and Finance
Bebczuk, R. N.	What determines the access to credit by SMEs in Argentina?	2004	
Becchetti, L., and M. M. Garcia	Informal collateral and default risk: do Grameen-like banks work in high-income countries?	2011	Applied Financial Economics
Berger, A. N., R. J. Rosen, and G. F. Udell	Does market size structure affect competition? The case of small business lending	2007	Journal of Banking and Finance
Berger, A. N., and G. F. Udell	Relationship lending and lines of credit in small firm finance	1995	Journal of Business
Berger, A. N., N. N. Miller, M. A. Petersen, R. M. Rajan, and J. C. Stein	Does function follow organizational form? Evidence from the lending practices of large and small banks	2005	Journal of Financial Economics
Berger, A. N., S. W. Frame, and V. Ioannidou	Tests of ex ante versus ex post theories of collateral using private and public information	2011	Journal of Financial Economics
Bharath, S., S. Dahiya, A. Saunders, and A. Srinivasan	Lending relationships and loan contract terms	2011	Review of Financial Studies
Blackwell, D. W., and D. B. Winters	Banking relationships and the effect of monitoring on loan pricing	1997	Journal of Financial Research
Bonfim, D., and Q. Dai	The number of bank relationships, borrowing costs and bank competition	2009	
Bongini, P., M. L. Di Battista, and E. Zavarrone	The value of relationship lending: Small banks in an era of consolidation	2007	Economic Notes
Bopaiah, C.	Availability of credit to family businesses	1998	Small Business Economics
Brick, I. E., and D. Palia	Evidence of jointness in the terms of relationship lending	2007	Journal of Financial Intermediation
Calomiris, C., and T. Pornrojnangkool	Relationship Banking and the pricing of financial services	2009	Journal of Financial Services Research
Castelli, A., Gerald P. D. Jr., and I. Hasan	Bank relationships and small firms' financial performance	2006	

Table A1

(continued)

Author(s)	Title	Year	Publication
Cavalluzzo, K. S., L. C. Cavalluzzo, and J. D. Wolken	Competition, small business financing, and discrimination: Evidence from a new survey	2002	Journal of Business
Cerqueiro, G., H. Degryse, and S. Ongena	Rules versus discretion in loan rate setting	2011	Journal of Financial Intermediation
Chakraborty, A., and C. X. Hu	Lending relationships in line-of-credit and nonline-of-credit loans: Evidence from collateral use in small business	2006	Journal of Financial Intermediation
Chakraborty, A., and R. Mallick	Credit gap in small businesses: Some new evidence	2012	International Journal of Business
Cole, R. A.	The importance of relationships to the availability of credit	1998	Journal of Banking and Finance
Cole, R. A., L. G. Goldberg, and L. J. White	Cookie cutter vs. character: The micro structure of small business lending by large and small banks	2004	Journal of Financial and Quantitative Analysis
Coleman, A. D.F., N. Esho, and I. G. Sharpe	Does bank monitoring influence loan contract terms?	2006	Journal of Financial and Quantitative Analysis
Cosci, S., and V. Meliciani	Multiple banking relationships: Evidence from the Italian experience	2002	Manchester School Supplement
Cowling, M.	The incidence of loan collateralization in small business lending contracts: Evidence from the UK	1999	Applied Economics Letters
D'Auria, C., A. Foglia, and P. M. Reedtz	Bank interest rates and credit relationships in Italy	1999	Journal of Banking and Finance
De Bodt, E., F. Lobez, and J. Statnik	Credit rationing, customer relationship and the number of banks: An empirical analysis	2005	European Financial Management
Degryse, H., and S. Ongena	Distance, lending relationships, and competition	2005	Journal of Finance
Degryse, H. and P. Van Cayseele	Relationship lending within a bank-based system: Evidence from European small business data	2000	Journal of Financial Intermediation
Deng, Y., M. Hu, and A. Srinivasan	Hold-up versus benefits in relationship banking: A natural experiment using REIT organizational form	2011	
Dennis, S., D. Nandy, and I. G. Sharpe	The determinants of contract terms in bank revolving credit agreements	2000	Journal of Financial and Quantitative Analysis
Elsas, R., and J. P. Krahnen	Is relationship lending special? Evidence from credit-file data in Germany	1998	Journal of Banking and Finance
Ewert, R., G. Schenk, and A. Szczesny	Determinants of bank lending performance in Germany	2000	Schmalenbach Business Review
Fernando, C., and A. Chakraborty	The importance of being known: Relationship banking and credit limits	2010	Quarterly Journal of Finance and Accounting
Ferri, G., and M. Messori	Bank-firm relationships and allocative efficiency in northeastern and central Italy and in the south	2000	Journal of Banking and Finance
Ferri, G., T. S. Kang, and I.-J. Kim	The value of relationship banking during financial crises: Evidence from the Republic of Korea	2001	
Fraser, D. R., S. Ghon Rhee, and G. Hwan Shin	The impact of capital market competition on relationship banking: Evidence from the Japanese experience	2012	Journal of Empirical Finance

38

Table A1

(continued)

Author(s)	Title	Year	Publication
Fredriksson, A.	The effect of relationship intensity on loan pricing	2007	
Gama, A. P. M., and F. Duarte	The role of collateral and relationship lending in loan pricing: evidence from United Kingdom SMEs	2011	
Gloy, B. A., M. A. Gunderson, and E. L. LaDue	The costs and returns of agricultural credit delivery	2005	Journal of Agricultural Economics
Guiso, L.	Small business finance in Italy	2003	
Hao, L.	Bank effects and the determinants of loan yield spreads	2003	
Harhoff, D., and T. Körting	Lending relationships in Germany - Empirical evidence from survey data	1998	Journal of Banking and Finance
Hernández-Cánovas, G., and J. Koëter-Kant	Debt maturity and relationship lending: An analysis of European SMEs	2008	International Small Business Journal
Hernández -Cánovas, G., and P. Martínez-Solano	Banking relationships: Effects on debt terms for small Spanish firms	2006	Journal of Small Business Management
Hernández -Cánovas, G., and P. Martínez -Solano	Effect of the number of banking relationships on credit availability: Evidence from panel data of Spanish small firms	2007	Small Business Economics
Hernández -Cánovas, G., and P. Martínez -Solano	Relationship lending and SME financing in the continental European bank-based system	2010	Small Business Economics
Howorth, C., and A. Moro	Trustworthiness and interest rates: An empirical study of Italian SMEs	2012	Small Business Economics
Hübler, O., L. Menkhoff, and C. Suwanaporn	Financial liberalisation in emerging markets: How does bank lending change?	2008	World Economy
Jiangli, W., H. Unal, and C. Yom	Relationship lending, accounting disclosure, and credit availability during the Asian financial crisis	2008	Journal of Money, Credit and Banking
Jiménez, G., V. Salas, and J. Saurina	Determinants of collateral	2006	Journal of Financial Economics
Jiménez, G., V. Salas, and J. Saurina	Organizational distance and use of collateral for business loans	2009	Journal of Banking and Finance
Jiménez, G., J. A. Lopez, and J. Saurina	Empirical analysis of corporate credit lines	2009	Review of Financial Studies
Kano, M., H. Uchida, G. F. Udell, and W. Watanabe	Information verifiability, bank organization, bank competition and bank–borrower relationships	2011	Journal of Banking and Finance
Kim, M.., and G. Lee	Effect of relationship banking on financing cost and performance of SMEs: Evidence from panel data of Korean small firms	2011	
Kirschenmann, K., and L. Norden	The relation between borrower risk and loan maturity in small business lending	2012	Journal of Business Finance and Accounting
Lehmann, E., and D. Neuberger	Do lending relationships matter? Evidence from bank survey data in Germany	2001	Journal of Economic Behavior and Organization
Lehmann, E., D. Neuberger, and S. Räthke	Lending to small and medium-sized firms: Is there an East-West gap in Germany?	2004	Small Business Economics
Li, Y., and A. Srinivasan	Relationship bank behavior during borrower distress and bankruptcy	2011	
Machauer, A., and M. Weber	Bank behavior based on internal credit ratings of borrowers	1998	Journal of Banking and Finance
Menkhoff, L., D. Neuberger, and C. Suwanaporn	Collateral-based lending in emerging markets: Evidence from Thailand	2006	Journal of Banking and Finance

Table A1
(continued)

Author(s)	Title	Year	Publication
Menkhoff, L., and C. Suwanaporn	On the rationale of bank lending in pre-crisis Thailand	2007	Applied Economics
Miarka, T.	The recent economic role of bank-firm relationships in Japan	1999	
Mitchell, K., and D. K. Pearce	Lending technologies, lending specialization, and minority access to small-business loans	2011	Small Business Economics
Montoriol-Garriga, J.	Relationship lending and small business finance: Empirical analysis of cost of capital, credit rationing, and firm performance	2006	
Neuberger, D., and S. Räthke-Döpplich	Microenterprises and multiple bank relationships: The case of professionals	2009	Small Business Economics
Niskanen, J., and M. Niskanen	Does relationship banking have value for small firms?	2000	Liiketaloudellinen Aikakauskirja
Norden, L., and M. Weber	Credit line usage, checking account activity, and default risk of bank borrowers	2010	Review of Financial Studies
Ogawa, K., E. Sterken, and I. Tokutsu	Multiple bank relationships and the main bank system: Evidence from a matched sample of Japanese small firms and main banks	2009	Contributions to Economics (book)
Ogura, Y.	Interbank competition and information production: Evidence from the interest rate difference	2010	Journal of Financial Intermediation
Ono, A., and I. Uesugi	Role of collateral and personal guarantees in relationship lending: Evidence from Japan's SME loan market	2009	Journal of Money, Credit and Banking
Ortiz-Molina, H., and M. F. Penas	Lending to small businesses: The role of loan maturity in addressing information problems	2007	Small Business Economics
Park, Y.	Parsimonious lenders: Bank concentration and credit availability to small businesses	2008	
Peltoniemi, J.	The value of relationship banking: Empirical evidence on small business financing in Finnish credit markets	2004	
Peltoniemi, J.	The benefits of relationship banking: Evidence from small business financing in Finland	2007	Journal of Financial Services Research
Petersen, M. A., and R. G. Rajan	Does distance still matter? The information revolution in small business lending	2002	Journal of Finance
Petersen, M. A., and R. G. Rajan	The benefits of lending relationships: Evidence from small business data	1994	Journal of Finance
Petersen, M. A., and R. G. Rajan	The effect of credit market competition on lending relationships	1995	Quarterly Journal of Economics
Pozzolo, A. F.	The role of guarantees in bank lending	2004	
Repetto, A., S. Rodríguez, and R. O. Valdes	Bank lending and relationship banking: Evidence from Chilean firms	2002	
Santikian, L.	The ties that bind: Bank relationships and small business lending	2011	
Schenone, C.	Lending relationships and information rents: Do banks exploit their information advantages?	2009	Review of Financial Studies
Scott, J. A., and William C. D.	Bank mergers and small firm financing	2003	Journal of Money, Credit and Banking

Table A1

(continued)

Author(s)	Title	Year	Publication
Scott, J. A.	Loan officer turnover and credit availability for small firms	2006	Journal of Small Business Management
Shikimi, M.	Do firms benefit from multiple banking relationships? Evidence from small and medium-sized firms in Japan	2005	
Shin, B., G. F. Udell, and S. Park	Lending relationships, credit availability, firm value and banking crises	2008	
Sohn, W., and H. Choi	Banks' lending decisions after loan acquisitions: Do banks favour pre-existing relationships?	2011	Applied Economics
Stein, I.	The price impact of lending relationships	2011	
Streb, J. M., J. Bolzico, P. Druck, A. Henke, J. Rutman, and W. Sosa Escudero	Bank relationships: Effect on the availability and marginal cost of credit for firms in Argentina	2002	
Uchida, H., G. F. Udell, and N. Yamori	Loan officers and relationship lending to SMEs	2012	Journal of Financial Intermediation
Uzzi, B.	Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing	1999	American sociological review
Voordeckers, W., and T. Steijvers	Business collateral and personal commitments in SME lending	2006	Journal of Banking and Finance
Weinstein, D. E., and Y. Yafeh	On the costs of a bank-centered financial System: Evidence from the changing main bank relations in Japan	1998	Journal of Finance
Wen, S., and C. Tseng	Collateral, relationship banking, and corporate credit risk	2006	
Yao, J., and H. Ouyang	Dark-side evidence on bank–firm relationship in Japan	2007	Japan and the World Economy
Ziane, Y.	Number of banks and credit relationships: Empirical results from French small business data	2003	European Review of Economics and Finance

Table A2
Definition of variables

Variable	Description	Source
Relationship strength proxy		
TIME_AGE	Time dimension of the relationship's strength measured by the age of the borrower	Own dataset
TIME_DURATION	Time dimension of the relationship's strength measured by the duration of the lending relationship	Own dataset
TIME_OTHER	Time dimension of the relationship's strength measured by other time-related variables, such as number of repeated interactions over time, loan officer turnover, or frequency of interactions	Own dataset
DISTANCE_PHYS	Distance dimension of the relationship's strength measured by physical distance between lender and borrower	Own dataset
DISTANCE_ORG	Distance dimension of the relationship's strength measured by organizational distance between lender and borrower, e.g. membership in lending institutions, cooperative membership, board linkages, or distance between bank branch and bank headquarters	Own dataset
DISTANCE_PERS	Distance dimension of the relationship's strength measured by personal distance between lender and borrower, e.g. degree of personal interactions, or a dummy variable indicating banking in person	Own dataset
EXCLUSIVE	Exclusivity dimension of the relationship's strength measured by the degree of exclusive lending relationship between lenders and borrowers, e.g. number of lending relationships, concentration of lending, or main bank status.	Own dataset
CROSSPRODUCT	Cross-product synergies dimension of the relationship's strength, e.g. number of services provided by the lender, existence of deposit taking services, and scope of financial services provision	Own dataset
Lending outcome proxy		
LOANRATE	Price of credit	Own dataset
LOANVOL	Credit availability	Own dataset
COLLAT	Collateral requirements	Own dataset
MATURITY	Loan maturity	Own dataset

Table A2
(continued)

Variable	Description	Source
Country variables		
Developed status	= 1 if the study dataset is from a high income group as defined by the World Bank country classification system, 0 otherwise. The development status is determined in the median year of the sampling window	The World Bank
Bank deposits / GDP	Demand, time and saving deposits in deposit money banks as a share of GDP, calculated using the following deflation method: $\{(0.5)*[Ft/P\_et + Ft\text{-}1/P\_et\text{-}1]\}/[GDPt/P\_at]$ where F is demand and time and saving deposits, P_e is end-of period CPI, and P_a is average annual CPI	Beck, T. and Demirgüç-Kunt, A., 2010. Financial Institutions and Markets across Countries and over Time: Data and Analysis World Bank policy
Bank competition	-1* assets of three largest banks as a share of assets of all commercial banks	Beck, T. and Demirgüç-Kunt, A., 2010 Financial Institutions and Markets across Countries and over Time: Data and Analysis World Bank policy
Corruption index	Corruption rating with range from 0=highest corruption to 6=lowest corruption	International Country Risk Guide by The PRS Group, Inc.
Bank cost-income ratio	Total costs as a share of total income of all commercial banks	Beck, T. and Demirgüç-Kunt, A., 2010. Financial Institutions and Markets across Countries and over Time: Data and Analysis. World Bank policy
Inflation	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency.	The World Bank
SME employment	Percentage of total employment by micro, small, and medium enterprises.	Kozak, M. 2007. Micro, Small, and Medium Enterprises: A Collection of Published Data. International Finance Corporation (IFC). Washington, D. C.

Table A2
(continued)

Variable	Description	Source
Publication variables		
Primary	=1 if the relationship lending is the main focus of the paper; =0 if relationship lending is not the main focus of the paper and serves in regressions as a control variable	Own dataset
Author affiliation ranking	Author affiliation ranking is a 5-year moving average of the Arizona State University Finance Rankings. The value is calculated for each author's affiliation and for each year of publication. For those authors, whose institution is not available in the ranking, we impute the value as the maximum of all rankings in our dataset of selected publications + 1. If the author is affiliated with more than one ranked institutions we use the one that is listed first	Arizona State University Finance Rankings
Banking journal	= 1 if the study appears in Journal of Banking and Finance; Journal of Money, Credit and Banking; or Journal of Financial Intermediation; 0 otherwise	Own dataset
Impact factor	Journal impact factor is from the Journal Citation Reports by Thomson ISI (ISI) in the year of the publication. If the impact factor is not available in the ISI dataset in the year of the publication, it is obtained from SCImago Journal and Country Rank database, which approximates the ISI impact factors. If a journal is neither available in Journal Citation Reports nor in the SCImago database, we impute the value of 0. Since, at the time of writing, the latest available Journal Citation Report is from 2010, papers in journals released after this year use the value as of 2010.	Journal Citation Reports by Thomson ISI, SCImago Journal and Country Rank database
Number of observations	Number of observations for each regression specification	Own dataset
Published	'= 1 if the study appears in a refereed journal, 0 otherwise	Own dataset
Publication year	The year of the publication. If the paper is available online first, the year of the online publication is used	Own dataset
Median sampling year	Median year of the sampling window of the dataset. In cross-sectional studies it is the year of the dataset	Own dataset
Number of citations	Number of citations is obtained from Web of Science for each published paper. The value is set to zero for publications that are not available in the Web of Science database	Web of Science by Thomson Reuters

Table A2
(continued)

Variable	Description	Source
Sets of dummy variables		
Dregion	3 dummy variables indicating the region of the study dataset. Dregion_US = USA, Dregion_Europe = Europe, Dregion_Other = other region. In meta-analytic regression the omitted reference dummy is the US (Dregion_US=1).	Own dataset
Dcountry	17 dummy variables indicating the country of the dataset. If a study uses a dataset with multiple countries, the dataset is denoted as Dcountry_multicountry. In meta-analytic regressions the omitted reference country is the US (Dcountry_US=1).	Own dataset

References

Agarwal, S., and R. Hauswald. 2010. Distance and Private Information in Lending. *Review of Financial Studies* 23:2757-2788.

Alessandrini, P., A. F. Presbitero, and A. Zazzaro. 2009. Banks, distances and firms' financing constraints, *Review of Finance* 13:261-307.

Allen, F., and D. Gale. 2000. *Comparing financial systems* (MIT Press, Cambridge, MA).

Angelini, P., R. Di Salvo, and G. Ferri. 1998. Availability and cost of credit for small businesses: Customer relationships and credit cooperatives. *Journal of Banking and Finance* 22:925-954.

Beck, T., A. Demirgüç-Kunt, and M. S. Martínez Pería. 2011. Bank Financing for SMEs: Evidence across countries and bank ownership types. *Journal of Financial Services Research* 39:35-54.

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

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

Berger, A. N., and G. F. Udell. 2006. A more complete conceptual framework for SME finance. *Journal of Banking and Finance* 30:2945-2966.

Berger, A. N., N. H. Miller, M. A. Petersen, R. G. Rajan, and J. C. Stein. 2005. Does function follow organizational form? Evidence from the lending practices of large and small banks. *Journal of Financial Economics* 76:237-269.

Berlin, M., and L. J. Mester. 1999. Deposits and relationship lending. *Review of Financial Studies* 12:579-607.

Bharath, S., S. Dahiya, A. Saunders, and A. Srinivasan. 2011. Lending Relationships and Loan Contract Terms. *Review of Financial Studies* 24:1141-1203.

Bijmolt, T. H. A., and R. G. M. Pieters. 2001. Meta-analysis in marketing when studies contain multiple measurements. *Marketing Letters* 12:157-169.

Black, S., and P. Strahan. 2002. Entrepreneurship and Bank Credit Availability. *Journal of Finance* 57:2807-2833.

Blackwell, D. W., and D. B. Winters. 1997. Banking relationships and the effect of monitoring on loan pricing. *Journal of Financial Research* 20:275-289.

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

Boot, A. W. A., and A. V. Thakor. 2000. Can relationship banking survive competition? *Journal of Finance* 55:679-713.

Borenstein, M., L. V. Hedges, J. P. T. Higgins, and H. R. Rothstein. 2009. *Introduction to Meta-Analysis* (John Wiley and Sons, Ltd., Chichester, UK).

Boyd, J. H., and E. C. Prescott. 1986. Financial intermediary-coalitions. *Journal of Economic Theory* 38:211-232.

Carbó-Valverde, S., F. Rodríguez-Fernández, and G. F. Udell. 2009. Bank market power and SME financing constraints. *Review of Finance* 13:309-340.

Chakraborty, A., and C. X. Hu. 2006. Lending relationships in line-of-credit and nonline-of-credit loans: Evidence from collateral use in small business. *Journal of Financial Intermediation* 15:86-107.

Coggin, T. D., F. J. Fabozzi, and S. Rahman. 1993. The investment performance of U.S. equity pension fund managers: An empirical investigation. *Journal of Finance* 48:1039-1055.

Cole, R. A. 1998. The importance of relationships to the availability of credit. *Journal of Banking and Finance* 22:959-977.

Cole, R. A., L. G. Goldberg, and L. J. White. 2004. Cookie cutter vs. character: The micro structure of small business lending by large and small banks. *Journal of Financial and Quantitative Analysis* 39:227-251.

Cowling, M. 1999. The incidence of loan collateralization in small business lending contracts: evidence from the UK. *Applied Economics Letters* 6:291-293.

De la Torre, A., M. S. Martínez Pería, and S. L. Schmukler. 2010. Bank involvement with SMEs: Beyond relationship lending. *Journal of Banking and Finance* 34:2280-2293.

Degryse, H., and P. Van Cayseele. 2000. Relationship lending within a bank-based system: Evidence from European small business data. *Journal of Financial Intermediation* 9:90-109.

Degryse, H., and S. Ongena. 2005. Distance, lending relationships, and competition. *Journal of Finance* 60:231-266.

Degryse, H., and S. Ongena. 2007. The impact of competition on bank orientation. *Journal of Financial Intermediation* 16:399-424.

Degryse, H., and S. Ongena. 2008. Competition and regulation in the banking sector: A review of the empirical evidence on the sources of bank rents, in Anjan V. Thakor and Arnoud W. A. Boot, eds.: *Handbook of Financial Intermediation and Banking* (Elsevier).

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.

Djankov, S., and P. Murrell. 2002. Enterprise restructuring in transition: A quantitative survey. *Journal of Economic Literature* 40:739-792.

Djankov, S., C. McLiesh, and A. Shleifer. 2007. Private credit in 129 countries. *Journal of Financial Economics* 84:299-329.

Doucouliagos, H., and M. Ulubasoglu. 2008. Democracy and Economic Growth: A meta-analysis. *American Journal of Political Science* 52:61-83.

Edgington, E. S. 1972. A normal curve method for combining probability values from independent experiments. *Journal of Psychology* 82:85-89.

Elsas, R. 2005. Empirical determinants of relationship lending. *Journal of Financial Intermediation* 14:32-57.

Elsas, R., and J. P. Krahnen. 1998. Is relationship lending special? Evidence from credit-file data in Germany. *Journal of Banking and Finance* 22:1283-1316.

Elyasiani, E., and L. G. Goldberg. 2004. Relationship lending: A survey of the literature, *Journal of Economics and Business* 56:315-330.

Flannery, M. J. 1986. Asymmetric information and risky debt maturity choice. *Journal of Finance* 41:19-37.

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

Greene, W. H. 2008. *Econometric Analysis* (Pearson Prentice Hall, New York).

Harhoff, D., and T. Körting. 1998. Lending relationships in Germany: Empirical evidence from survey data. *Journal of Banking and Finance* 22:1317-1353.

Haselmann, R., Pistor, K., and V. Vig. 2012. How Law Affects Lending. *Review of Financial Studies* 23:549-580.

Hauswald, R., and R. Marquez. 2003. Information Technology and Financial Services Competition. *Review of Financial Studies* 16:921–48.

Hedges, L. V., and I. Olkin. 1985. *Statistical Methods for Meta-Analysis* (Academic Press, Orlando).

Hedges, L. V., E. Tipton, and M. C. Johnson. 2010. Robust variance estimation in meta-regression with dependent effect size estimates. *Research Synthesis Methods* 1:39-65.

Hertzberg, A., J. M. Liberti, and D. Paravisini. 2010. Information and incentives inside the firm: Evidence from loan officer rotation. *Journal of Finance* 65:795-828.

Holland, A. S. 1995. Inflation and uncertainty: Tests for temporal ordering. *Journal of Money, Credit and Banking* 27:827-837.

Howorth, C., and A. Moro. 2012. Trustworthiness and interest rates: An empirical study of Italian SMEs. *Small Business Economics* 39:161-177.

Hunter, J. E., and F. L. Schmidt. 1990. *Methods of Meta-Analysis: Correcting error and bias in research findings* (Sage Publications Newbury Park, CA).

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

Jiménez, G., and J. Saurina. 2004. Collateral, type of lender and relationship banking as determinants of credit risk. *Journal of Banking and Finance* 28:2191-2212.

Jiménez, G., V. Salas, and J. Saurina. 2009. Organizational distance and use of collateral for business loans. *Journal of Banking and Finance* 33:234-243.

Kandel, S., A. R. Ofer, and O. Sarig. 1996. Real interest rates and inflation: An ex-ante empirical analysis. *Journal of Finance* 51:205-225.

Kano, M., H. Uchida, G. F. Udell, and W. Watanabe. 2011. Information verifiability, bank organization, bank competition and bank-borrower relationships. *Journal of Banking and Finance* 35:935-954.

Kim, M., Kliger, D., and B. Vale. 2003. Estimating switching costs: the case of banking. *Journal of Financial Intermediation* 12:25-56.

King, R. G., and R. Levine. 1993. Finance and growth: Schumpeter might be right. *Quarterly Journal of Economics* 108:717-737.

Kirschenmann, K., and L. Norden. 2012. The relationship between borrower risk and loan maturity in small business lending. *Journal of Business Finance and Accounting* 39:730-757.

Krahnen, J. P., and R. H. Schmidt. 2004. *The German Financial System* (Oxford University Press).

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny. 1999. The quality of government. *Journal of Law, Economics and Organization* 15:222-279.

Lehmann, E., and D. Neuberger. 2001. Do lending relationships matter? Evidence from bank survey data in Germany. *Journal of Economic Behavior and Organization* 45:339-359.

Leland, H. E., and D, H. Pyle. 1977. Informational asymmetries, financial structure, and financial intermediation. *Journal of Finance* 32:371-387.

Lipsey, M. W., and D. B. Wilson. 2001. *Practical Meta-Analysis* (Sage, Thousand Oaks, CA).

Machauer, A., and M. Weber. 1998. Bank behavior based on internal credit ratings of borrowers. *Journal of Banking and Finance* 22:1355-1383.

Mester, L. J., L. I. Nakamura, and M. Renault. 2007. Transactions accounts and loan monitoring. *Review of Financial Studies* 20:529-556.

Mistrulli, P. E., and L. Casolaro. 2008. Distance, lending technologies and interest rates, Working Paper, Bank of Italy.

Nakamura, L. I. 1993. Bank information: Implications for the structure of banking, in Michael Klausner and Lawrence J. White, eds.: *Structural Change in Banking* (Irwin Professional Pub).

Norden, L., and M. Weber. 2010. Credit line usage, checking account activity, and default risk of bank borrowers. *Review of Financial Studies* 23:3665-3699.

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

Petersen, M.A., and R.G. Rajan. 1995. The Effect of Credit Market Competition on Lending Relationships. *Quarterly Journal of Economics* 110:406-443.

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

Presbitero, A., and A. Zazzaro. 2011. Competition and relationship lending: Friends or foes? *Journal of Financial Intermediation* 20:387-413.

Rajan, R. G. 1992. Insiders and Outsiders: The Choice Between Informed and Arm's-Length Debt. *Journal of Finance* 47:1367-1406.

Ramakrishnan, R. T. S., and A. V. Thakor. 1984. Information reliability and a theory of financial intermediation. *Review of Economic Studies* 51:415-432.

Santikian, L. 2011. The Ties That Bind: Bank Relationship and Small Business Lending. Working paper.

Scott, J. A. 2004. Small business and the value of community financial institutions. *Journal of Financial Services Research* 25:207-230.

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

Stein, J. C. 2002. Information production and capital allocation: Decentralized versus hierarchical firms. *Journal of Finance* 57:1891-1921.

Uchida, H., G. F. Udell, and N. Yamori. 2012. Loan officers and relationship lending to SMEs. *Journal of Financial Intermediation* 21:97-122.

Uchida, H., G. F. Udell, and W. Watanabe. 2008. Bank size and lending relationships in Japan. *Journal of Japanese and International Economies* 22:242–267.

Uzzi, B. 1999. Embeddedness in the making of financial capital: How social relations and networks benefit firms seeking financing. *American Sociological Review* 64:481-505.

van Ewijk, C., de Groot, H., and A. J. Santing. 2012. A meta-analysis of the equity premium. *Journal of Empirical Finance* 19:819-830.

von Thadden, E. L. 2004. Asymmetric information, bank lending, and implicit contracts: The winner's curse. *Finance Research Letters* 1:11–23.
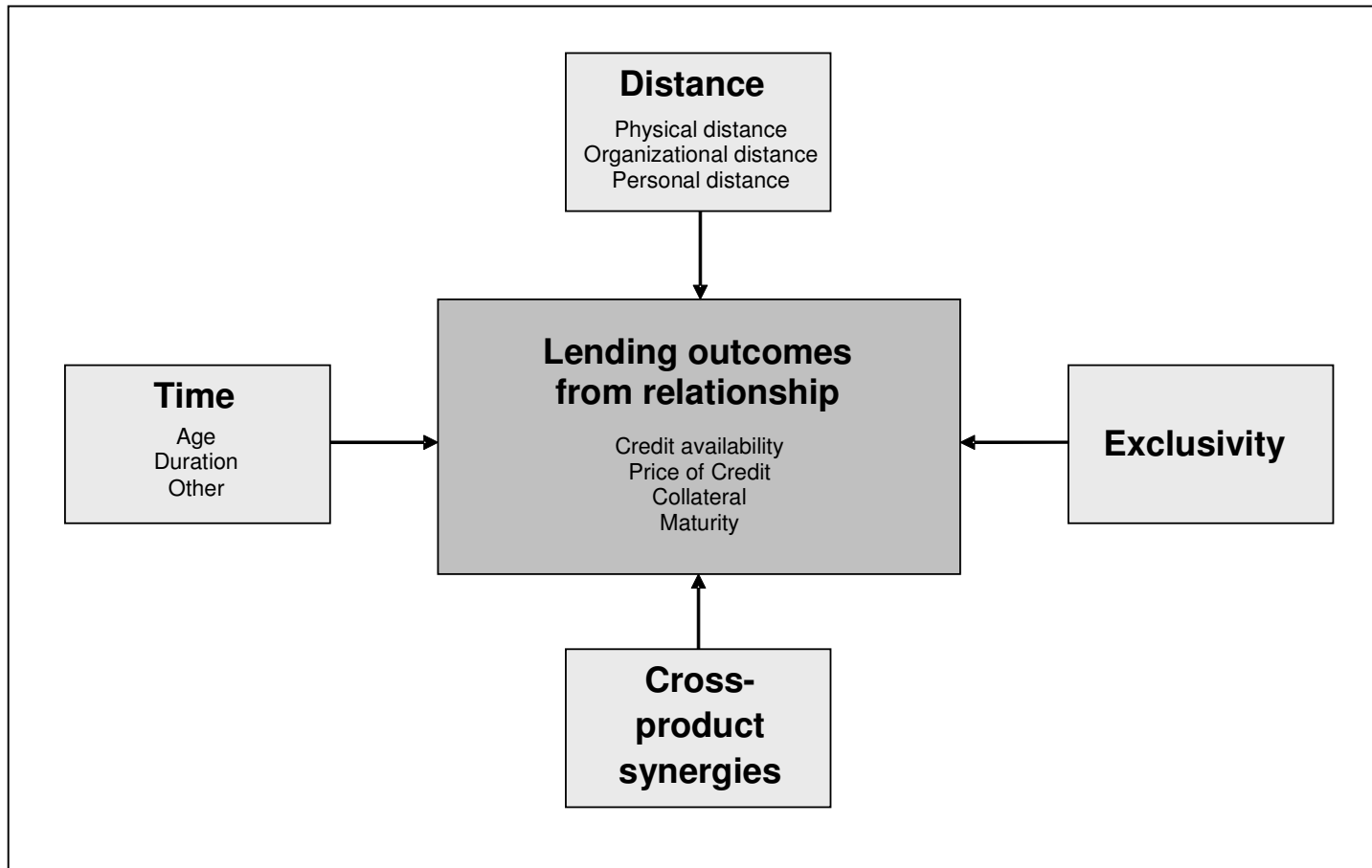
Figure 1
Dimensions of the strength of lending relationships and their lending outcomes

This figure displays the multi-dimensional conceptual framework. The effects of relationship lending are represented by the impact of the four dimensions of the strength of bank-borrower relationships on their lending outcomes shown in the center of the figure.
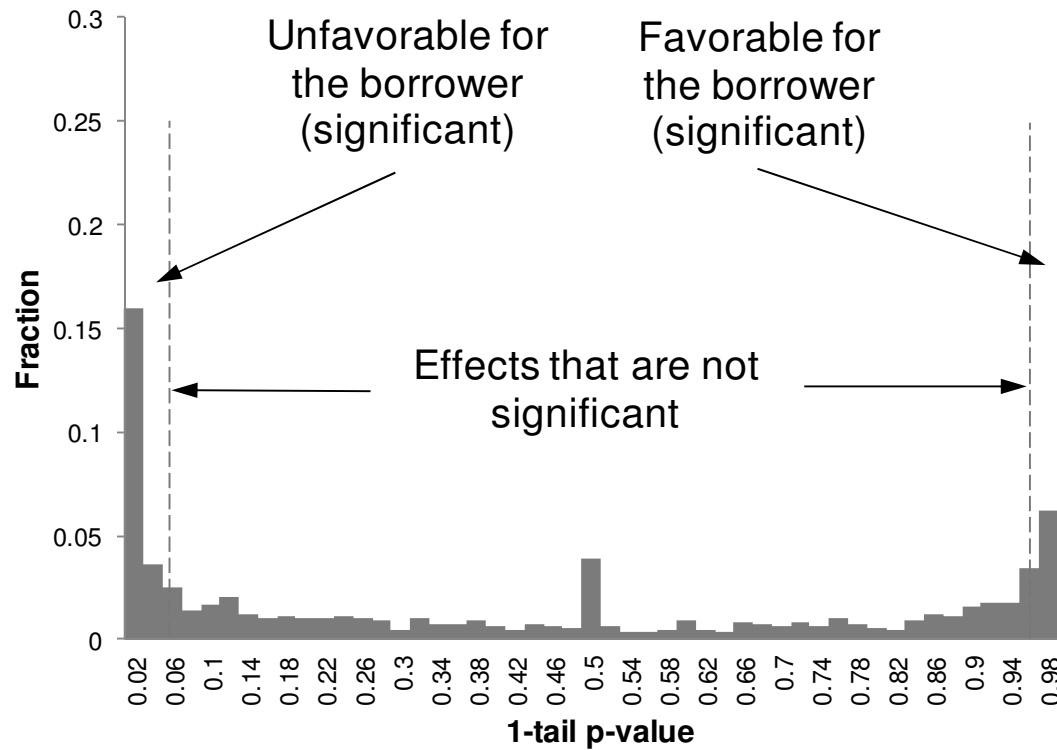
Figure 2

Distribution of the 1-tail *p*-values

This figure shows the frequency distribution of one-tailed *p*-values from all selected studies. Values approaching zero represent results with significantly non-beneficial effects for borrowers at the 10% level; values approaching one represent results with significantly beneficial effects for borrowers at the 10% level. Values in the range of 0.05-0.95 indicate results for the borrower benefits that are not significant at the 10% level. The distribution is based on the total number of 2,968 observations.
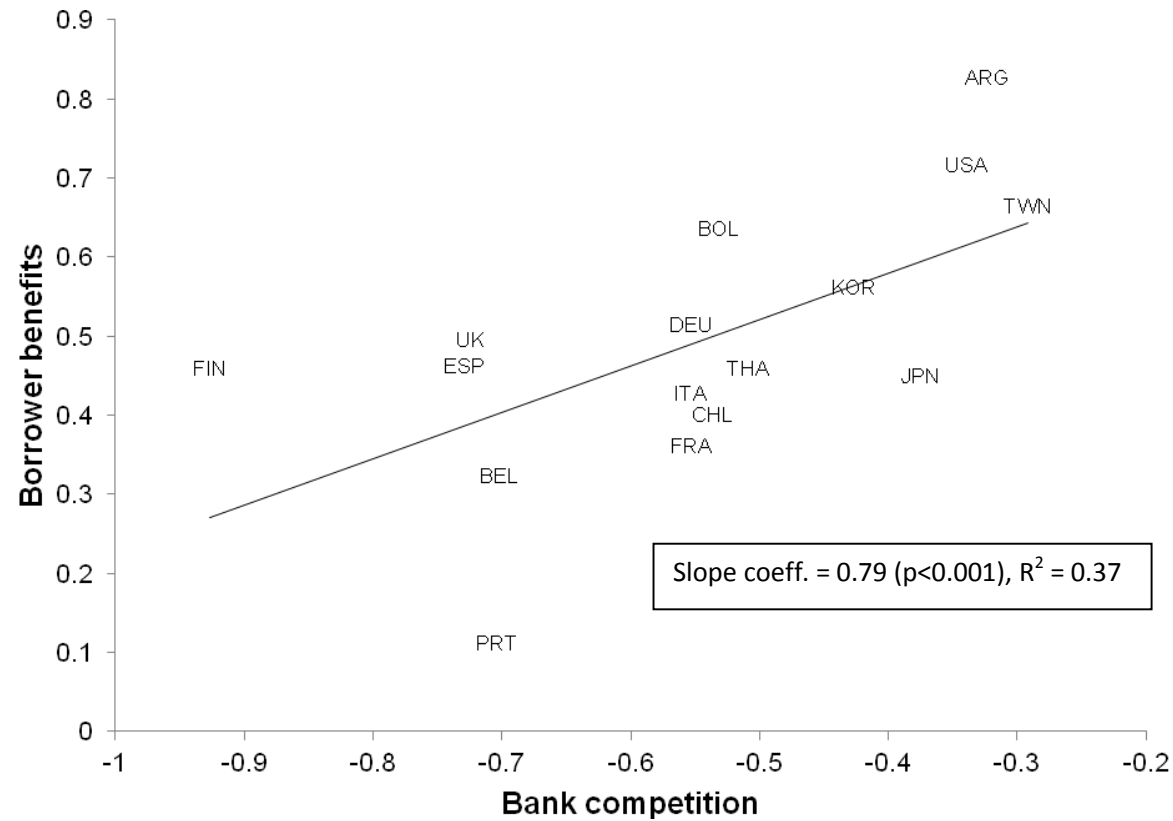
Figure 3
Relationship lending benefits and bank competition

This figure shows the means of bank competition (0=perfect monopoly; 1=perfect competition), and borrower benefits measured by 1-tail p-values (0=significant non-beneficial effect for the borrower; 1=significant beneficial effect for the borrower). The means are calculated as equal-weighted averages of observations per country over the sample period within each study. Effect sizes from multi-country studies are excluded. Acronyms for countries included in the diagram are as follows: ARG=Argentina, BEL=Belgium, BOL=Bolivia, CHL=Chile, DEU=Germany, ESP=Spain, FIN=Finland, FRA=France, ITA=Italy, JPN=Japan, KOR=South Korea, PRT=Portugal, THA=Thailand, TWN=Taiwan, UK=United Kingdom.
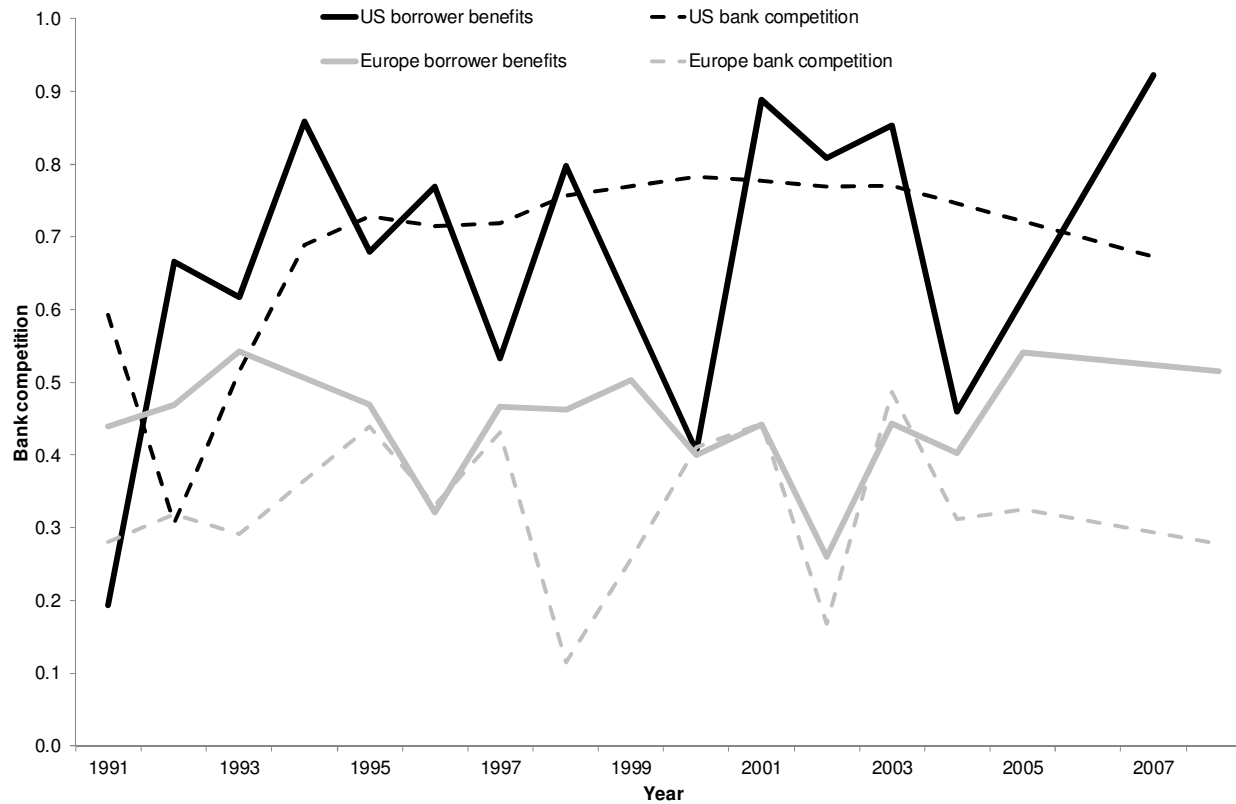
Figure 4

Relationship lending benefits and bank competition in Europe and the US over time

This figure shows the means of bank competition (0=perfect monopoly; 1=perfect competition) and borrower benefits measured as 1-tail p-values (0=significant non-beneficial effect for the borrower; 1=significant beneficial effect for the borrower) over time in Europe and the US. Values within Europe are aggregated as equal weighted averages per each year.
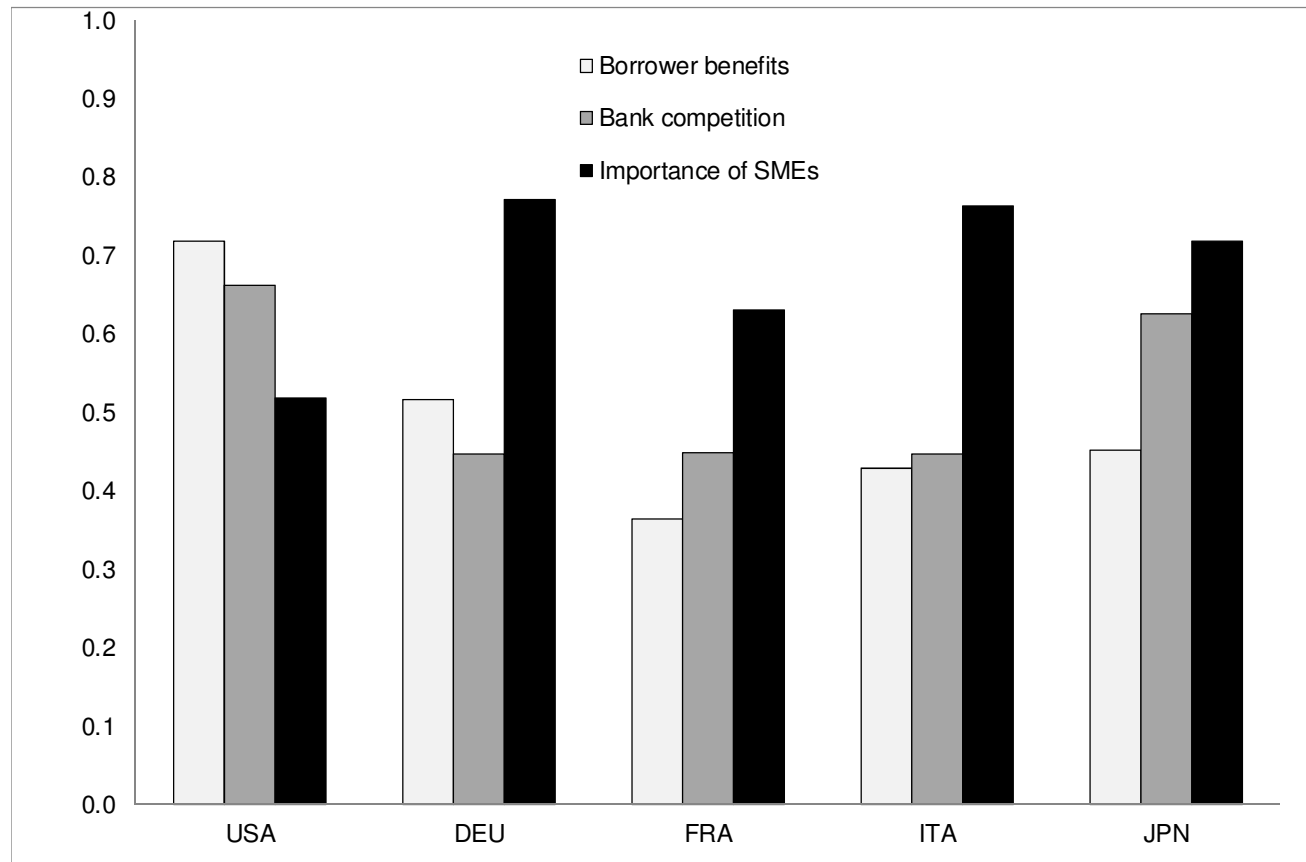
Figure 5
Relationship lending benefits, bank competition and the importance of SMEs

This figure shows the means of borrower benefits measured as the 1-tail p-values (light gray bars; 0=significant and non-beneficial outcome for the borrower; 1=significant and beneficial outcome for the borrower), bank competition (dark gray bars; 0=perfect competition; 1=perfect monopoly), and the importance of SME as percentage of total employment (black bars). The means are computed as equal-weighted averages per study over the sample period of the study. Acronyms for countries included in the diagram are as follows: DEU=Germany, FRA=France, ITA=Italy, JPN=Japan.

Table 1

Publication summary statistics

This table summarizes the characteristics of the selected studies. A study is denoted as published if it appears in a refereed journal. The region relates to the geography of the data sample in each paper. The development status of countries is based on the World Bank development classification in the median sampling year. The data source represents the primary source of a study's information. The focus on relationship lending denotes whether a study uses relationship strength proxies as the primary explanatory variables in the empirical design. If relationship strength proxies serve as control variables, then a paper is designated as secondary. Banking journals in the selected set of publications include the Journal of Banking and Finance; Journal of Money, Credit and Banking; and the Journal of Financial Intermediation. The author's affiliation ranking is calculated as a five-year moving average of the Arizona State University (ASU) Finance Rankings of each author's affiliation in the year of the publication. The values for this variable comprise only those institutions that are available in the ASU data set. The journal's impact factor is from the Journal Citation Report by Thomson ISI (ISI) for the year of the publication. If the impact factor is not available in the ISI data set for the year of the publication, it is obtained from the SCImago Journal and Country Rank database, which approximates the ISI impact factors. The number of citations is obtained from Web of Science for each published paper. The journal's impact factor and the number of citations are reported only for published studies. The firm count is the total number of unique firms included in each study. The observation count is the number of unique firm-year observations approximated as the maximum number of observations in any regression specification within each study.

Panel A. Sample composition (number of studies)

Publication status		Region		Development status		Data source		Focus on relationship lending	
Published studies	75	US	35	Developed	87	Firm survey	46	Primary	62
of which		Europe	43	Emerging	14	Proprietary bank data	23	Secondary	39
Banking journals	21	Other regions	23			Other	32		
Other journals	54								
Unpublished studies	26								
Total	101		101		101		101		101

Panel B. Sample characteristics

	Mean	Median	Min	Max	St. dev.
Publication year	2005.3	2006	1994	2012	4.62
Sample period mid-year	1996.6	1997	1978	2008	5.23
Author affiliation ranking	119	139	5	246	62
Journal impact factor	1.263	0.807	0.146	4.602	1.032
Number of citations	49.79	8	0	563	104.81
Firm count	9,994	1,800	100	368,977	41,802
Observation count	44,176	1,500	139	2,078,434	227,522

Table 2
Number of effect sizes and relative frequencies

Panel A shows the number and the direction of the effect coefficients from the individual regressions of all selected studies. For each combination of the relationship's strength and lending outcome, (+) denotes positive and significant regression coefficients, (-) denotes negative and significant coefficients, and (ns) denotes coefficients that are not statistically significant at the 10% level. *, **, *** indicate significance according to a two-tail binomial sign test at the 10%, 5%, and 1% levels, respectively. Panel B reports the overall one-tail p-value (p) calculated according to the Edgington (1972) model where values approaching one indicate significance for the beneficial effects of bank-firm relationships at the 10% level, and values approaching zero indicate significance for the non-beneficial effects of bank-firm relationships at the 10% level. The pooled estimates of the overall p-values are derived from the first occurrence of an effect size per each relationship-outcome combination per each study. The overall correlations (ρ) are meta-analytic pooled estimates of random-effects mean correlations (see Borenstein et al., 2009; Lipsey and Wilson, 2001). The overall effect is based on partial correlations, which are obtained from the t-values of the regression coefficients according to Greene (2008, Chapter 3). The null hypothesis of the significance test is that the true pooled effect is zero. *, **, *** indicate significance at the 10%, 5%, and 1% levels respectively. The number of studies (N) is the total number of studies that contain at least one effect size for the combination of the relationship lending dimension and a lending outcome. All variables are defined in Table AII of the appendix.

Panel A: Discrete effects

	Strength of relationship lending	Coeff. sign	Relationship lending outcomes							
			LOANRATE		LOANVOL		COLLAT		MATURITY	
TIME	TIME_DURATION	+	67		74		17		2	
		-	102	***	27	***	33	**	11	---
		ns	114		56		58		10	
	TIME_AGE	+	17		70		17			
		-	48	***	20	***	21			---
		ns	135		93		37		13	
	TIME_OTHER	+	7		31					
		-	14		20		6	---		
		ns	39		36		3			
EXCL	EXCLUSIVE	+	137		132		46			
		-	225	***	99	**	22	***	2	---
		ns	188		177		49		9	
CROSS PROD	CROSSPRODUCT	+	4		75		9		4	
		-	114	***	15	***	12			---
		ns	86		59		17		11	
DISTANCE	DISTANCE_PHYS	+	5		29					
		-	31	***	23					---
		ns	31		44				5	
	DISTANCE_ORG	+	1		31		2			
		-	1	---	14	**	9	---		
		ns	4		22		1			
	DISTANCE_PERS	+			7					
		-	4	---		---				
		ns	1		2					

Panel B: Continuous effects

			Relationship lending outcomes			
Strength of relationship lending			LOANRATE	LOANVOL	COLLAT	MATURITY
TIME	TIME_DURATION	p	0.34	0.96	0.76	0.18
		ρ	0.000	0.018 ***	-0.009 ***	-0.022 ***
		N	43	31	27	3
	TIME_AGE	p	1.00	1.00	0.99	0.77
		ρ	-0.004	0.019 ***	-0.004	0.008
		N	29	31	18	2
	TIME_OTHER	p	0.87	0.85	0.99	0.99
		ρ	-0.003	0.018 ***	-0.053 ***	0.048 ***
		N	3	4	2	1
EXCL	EXCLUSIVE	p	1.00	0.99	0.02	0.12
		ρ	-0.013 ***	-0.007 ***	0.015 ***	-0.009
		N	46	40	24	3
CROSS PROD	CROSSPRODUCT	p	0.92	0.88	0.41	0.59
		ρ	-0.061 ***	0.039 ***	-0.020	0.024
		N	18	15	6	2
DISTANCE	DISTANCE_PHYS	p	0.21	0.94		0.72
		ρ	-0.006	0.082 ***		-0.017
		N	8	12		1
	DISTANCE_ORG	p	0.50	0.96	0.00	
		ρ	-0.010	0.018 ***	-0.002	
		N	4	6	4	
	DISTANCE_PERS	p	0.01	0.01		
		ρ	-0.044 ***	0.054 ***		
		N	3	2		

Table 3

Distribution of relationship lending outcomes by country-level indicators relationship dimensions

This table reports the distribution of relationship lending outcomes by country-level indicators and relationship dimensions. 'Low' and 'High' threshold refers to the sample median of a given country indicator. "% beneficial effects" is the fraction of relationship lending outcomes that are significant and beneficial for the borrower out of all significant results within the given group below or over the median (except for the developed status, which is determined by the World Bank income group category). 1-tail p-value is the average of all continuous 1-tail p-values, indicating both significant and non-significant outcomes. Values approaching 1 are significant and beneficial for the borrower and values approaching 0 are significant and non-beneficial for the borrower; values in between are non-significant.

		Overall		Time		Exclusivity		Cross-product synergies		Distance	
		% beneficial effects	1-tail p-value	% beneficial effects	1-tail p-value	% beneficial effects	1-tail p-value	% beneficial effects	1-tail p-value	% beneficial effects	1-tail p-value
Developed status	No	60.09	0.55	61.29	0.60	53.79	0.49	100.00	0.98	--	0.55
	Yes	62.57	0.56	67.40	0.59	58.00	0.53	86.79	0.70	28.21	0.56
	All	62.25	0.56	66.78	0.59	57.16	0.52	87.83	0.72	28.66	0.56
Bank deposits / GDP	Low	60.73	0.54	66.44	0.58	67.49	0.60	87.00	0.65	29.90	0.35
	High	63.65	0.58	67.09	0.60	43.53	0.42	88.46	0.80	26.67	0.40
	All	62.29	0.56	66.78	0.59	57.10	0.52	87.83	0.72	28.66	0.37
Bank competition	Low	42.69	0.43	52.78	0.49	40.23	0.41	86.23	0.69	22.11	0.28
	High	76.13	0.68	74.19	0.66	69.71	0.63	100.00	0.95	38.98	0.46
	All	61.43	0.55	64.59	0.57	56.77	0.52	89.45	0.73	28.57	0.37
Corruption index	Low	56.13	0.54	59.72	0.56	59.66	0.55	87.89	0.76	33.72	0.37
	High	70.17	0.59	78.30	0.62	53.63	0.49	83.33	0.38	22.06	0.37
	All	62.32	0.56	67.06	0.59	56.94	0.52	87.77	0.72	28.57	0.37
Inflation	Low	66.47	0.59	66.20	0.57	71.14	0.64	80.00	0.62	23.61	0.38
	High	57.68	0.54	67.08	0.60	41.06	0.40	94.40	0.83	32.94	0.36
	All	62.22	0.56	66.67	0.59	57.05	0.52	87.83	0.72	28.66	0.37
Bank cost-income ratio	Low	68.98	0.58	75.16	0.62	59.20	0.53	76.19	0.59	22.22	0.36
	High	53.13	0.52	51.21	0.51	53.93	0.51	97.76	0.89	34.15	0.37
	All	61.43	0.55	64.59	0.57	56.77	0.52	89.45	0.73	28.57	0.37

Table 4

Relationship lending and country characteristics

This table reports the meta-analytic regressions to explain the heterogeneity of relationship lending benefits for the borrowers by country-level and region characteristics. The beneficial effect for the borrower is one of the following: lower price of credit, higher credit availability, lower collateral requirements, or longer loan maturity. Panel A shows the results from regressions with country characteristics, Panel B shows the results with country effects and region effects. In Panel A, Models (1) and (2) report results, respectively, from the pooled logit regression and the panel logit regression where the dependent variable is a binary variable equal to one if the bank-borrower relationship has a beneficial effect at the 10% significance level and zero otherwise. The estimation of the pooled model takes into account the clustering of observations at the publication level. The panel specification groups observations by publications. Models (3) and (4) report results, respectively, from the pooled tobit regression and the panel tobit regression where the dependent variable is a one-tail p-value indicating the continuous significance level of the relationship lending benefits for borrowers. The values approaching one indicate significance of beneficial effects for the borrowers; values approaching zero indicate significance of non-beneficial effects for the borrowers; values in the range 0.05-0.95 indicate effects that are not statistically significant. The estimation of the pooled model takes into account the clustering of observations at the publication level. The panel specification groups observations by publications. Model (5) reports results from the meta-analytic regression analysis with random effects (MARA; Lipsey and Wilson, 2001) that is an extension of the variance-weighted least square regression for the meta-analysis. Model (6) reports robust random-effects meta-regression with dependent effect sizes (Hedges et al., 2010). This estimation takes into account the correlation of within-study observations. In both Models (5) and (6) the dependent variable is Fisher's z-score derived from the partial correlations (Borenstein et al., 2009). Positive Fisher's z-scores indicate a positive relation between the strength of the relationship and benefits for the borrowers, negative Fisher's z-scores indicate a negative relation. Panel B reports the regression results with country and region effects. Models (1) and (3) use the same pooled logit estimation as in Model (1) of Panel A. Models (2) and (4) use the same robust meta-regression with dependent effect sizes as in Model (6) of Panel A. Variables prefixed with "Dcountry_" and "Dregion_" are dummy variables indicating, respectively, the country and the region of the data set. The omitted reference country and the region is the United States. The I2 in meta-regressions denotes the proportion of the residual variation attributable to between-study heterogeneity. The adjusted R2 in the meta-regressions denotes the proportion of the between-study variance explained by the meta-regression. The Tau2 is the residual maximum likelihood estimation of the between-study variance. All of the variables are defined in Table AII of the appendix. The *, **, *** indicate the coefficients that are significantly different from zero at the 10%, 5%, and 1% levels respectively.

Panel A: Country characteristics

Method:	Logit, pooled			Logit, panel with random effects			Tobit, pooled			Tobit, panel with random effects			Meta-regression			Robust meta-regression with dep. effect sizes		
	(1)			(2)			(3)			(4)			(5)			(6)		
Dep. Var.:	Binary borrower benefits (1=yes, 0=no)			Binary borrower benefits (1=yes, 0=no)			one-tailed *p*-value borrower benefits			one-tailed *p*-value borrower benefits			Fisher's *z*-score			Fisher's *z*-score		
	Coeff.	z	sig.	Coeff.	z	sig.	Coeff.	t	sig.	Coeff.	z	sig.	Coeff.	t	sig.	Coeff.	t	sig.
Developed status	-0.09	-0.20		0.09	0.11		-0.05	-0.50		-0.03	-0.29		-0.01	-0.87		-0.01	-0.31	
Bank deposits / GDP	-1.58	-3.12	***	-1.67	-2.31	**	-0.20	-2.35	**	-0.16	-2.14	**	-0.02	-2.85	***	-0.03	-1.99	*
Bank competition	3.52	4.32	***	2.81	2.26	**	0.63	5.03	***	0.46	3.43	***	0.11	8.66	***	0.06	2.05	**
Corruption index	0.39	2.10	**	0.44	1.35		0.04	1.23		0.04	1.01		0.02	4.16	***	0.01	1.14	
Bank cost-income ratio	-1.46	-1.31		-1.44	-0.69		-0.11	-0.63		-0.09	-0.38		-0.01	-0.53		0.00	0.08	
Inflation	-0.10	-1.28		-0.14	-1.00		-0.02	-1.44		-0.02	-1.52		0.00	-3.17	***	0.00	-1.23	
Ln no. of observations	0.02	0.31		0.11	1.26		0.01	0.73		0.01	1.17		0.00	1.39		0.00	0.83	
Constant	3.44	2.44	**	2.24	0.84		1.05	4.08	***	0.89	3.01	***	0.03	1.04		0.03	0.48	
Rel. lending outcomes	Yes			Yes			Yes			Yes			Yes			Yes		
Rel. strength proxy	Yes			Yes			Yes			Yes			Yes			Yes		
Number of studies	82			82			83			83			83			83		
Number of observations	1,467			1,478			2,608			2,608			2,608			2,608		
McFadden Adj. R2	0.17						0.12											
I2													0.973					
Adj. R2													0.097					
Tau2													0.0105			0.0048		

Panel B: Region and country effects

Method:	Logit, pooled			Robust meta-regression with dep. effect sizes			Logit, pooled			Robust meta-regression with dep. effect sizes		
	(1)			(2)			(3)			(4)		
Dep. Var.:	Binary borrower benefits (1=yes, 0=no)			Fisher's z-score			Binary borrower benefits (1=yes, 0=no)			Fisher's z-score		
	Coeff.	z	sig.	Coeff.	t	sig.	Coeff.	z	sig.	Coeff.	t	sig.
Dcountry_Argentina	-0.03	-0.03		0.01	0.23							
Dcountry_Belgium	-2.43	-9.79	***	-0.07	-2.54	**						
Dcountry_Bolivia	-0.38	-0.96		0.01	0.41							
Dcountry_Chile	-1.92	-5.67	***	-0.11	-8.78	***						
Dcountry_Germany	-0.98	-1.57		-0.03	-1.64							
Dcountry_Spain	-1.95	-4.66	***	-0.03	-2.11	**						
Dcountry_Finland	-1.29	-4.26	***	-0.04	-2.22	**						
Dcountry_France	-4.15	-11.55	***	-0.08	-5.44	***						
Dcountry_UK	-1.88	-5.09	***	-0.06	-2.13	**						
Dcountry_Italy	-1.44	-5.21	***	-0.03	-1.64							
Dcountry_Japan	-2.43	-5.77	***	-0.06	-2.44	**						
Dcountry_Korea	-1.10	-2.00	**	-0.02	-0.84							
Dcountry_Portugal	-5.29	-16.46	***	-0.06	-4.23	***						
Dcountry_Thailand	-1.45	-3.89	***	-0.03	-2.07	**						
Dcountry_multicountry	-0.71	-1.48		-0.02	-1.13							
Dregion_Other							-1.49	-3.33	***	-0.04	-2.19	**
Dregion_Europe							-1.78	-5.75	***	-0.03	-3.13	***
Ln no. of observations	-0.01	-0.08		0.00	-0.07		-0.06	-1.20		0.00	-0.12	
Constant	2.17	3.20	***	0.04	1.60		2.55	4.48	***	0.04	2.00	**
Controls for relationship lending outcomes	Yes			Yes			Yes			Yes		
Controls for relationship strength proxy	Yes			Yes			Yes			Yes		
Number of studies	94			95			94			95		
Number of observations	1,596			2,871			1,596			2,871		
McFadden Adj. R2	0.20						0.16					
Tau2				0.0048						0.004		

Table 5

Three-outcome multinomial logit model and monotonicity of effects

This table reports the results from the multinomial logistic models with the three categorical variables: -1 denotes the effect sizes that are significant and not beneficial for the borrower; 0 denotes the effect sizes that are nonsignificant; and 1 denotes the effect sizes that are significant and positive for the borrower. A beneficial effect for the borrower is one of the following: lower price of credit, higher credit availability, less collateral requirements, or longer loan maturity. The significance is determined at the 10% level. Column (1) shows the estimation for the outcome for -1, the effects sizes that are significant and not beneficial for the borrower, relative to the nonsignificant results. Column (2) shows the reference outcomes. Column (3) shows the estimation for the outcome for 1, the effect sizes that are significant and beneficial for the borrower, relative to the nonsignificant results. Column (4) shows the overall results for binary dependent variable using the same specification. All of the models include a constant, and two sets of dummies representing the type of proxy for the relationship's strength and its lending outcome. All of the variables are defined in Table AII of the appendix. All of the regressions take into account the clustering of observations at the publication level. The *, **, *** indicate the coefficients that are significantly different from zero at the 10%, 5%, and 1% levels respectively.

Panel A: Country characteristics

Method:	Multinomial logit							Logit, pooled		
	(1)			(2)	(3)			(4)		
	No benefit for the borrower			Nonsignificant effect	Benefit for the borrower			Overall effect from Table 4, Panel A, Column (1)		
Dep. Var.:										
	Coeff.	z-stat	sig.		Coeff.	z-stat	sig.	Coeff.	z-stat	sig.
Developed status	0.07	0.20		0.00	0.06	0.12		-0.09	-0.20	
Bank deposits / GDP	-0.06	-0.18		0.00	-1.56	-3.31	***	-1.58	-3.12	***
Bank competition	-0.15	-0.22		0.00	3.70	4.22	***	3.52	4.32	***
Corruption index	-0.37	-2.44	**	0.00	0.01	0.06		0.39	2.10	**
Bank cost-income ratio	-0.17	-0.19		0.00	-1.26	-1.46		-1.46	-1.31	
Inflation	0.04	0.57		0.00	-0.03	-0.43		-0.10	-1.28	
Ln no. of observations	0.34	5.99	***	0.00	0.35	4.48	***	0.02	0.31	
Number of studies	83							82		
Number of observations	2,607							1,467		
McFadden Adj. R2	0.13							0.17		

Panel B: Regions

Method:	Multinomial logit						Logit, pooled		
	(1)			(2)	(3)			(4)		
Dep. Var.:	No benefit for the borrower			Nonsignificant effect	Benefit for the borrower			Overall effect from Table 4, Panel B, Column (3)		
	Coeff	*z*-stat	sig.		Coeff	*z*-stat	sig.	Coeff	*z*-stat	sig.
Dregion_Other	0.72	2.18	**	0.00	-0.86	-1.94	*	-1.49	-3.33	***
Dregion_Europe	0.53	1.74	*	0.00	-1.42	-3.82	***	-1.78	-5.75	***
Ln no. of observations	0.38	7.22	***	0.00	0.33	4.50	***	-0.06	-1.20	
Number of studies	95							94		
Number of observations	2870							1,596		
McFadden Adj. R2	0.12							0.16		

Table 6

Relationship lending and study characteristics

This table reports the meta-analytic regressions that explain the heterogeneity of relationship lending benefits for the borrowers by publication level and country effects. A beneficial effect for the borrower is one of the following: lower price of credit, higher credit availability, lower collateral requirements, or longer loan maturity. Models (1) and (2) report the results, respectively, from the pooled logit and panel logit regressions where the dependent variable is a binary variable equal to one if the bank-borrower relationship has a beneficial effect for borrowers at the 10% significance level and zero otherwise. The estimation of the pooled model takes into account the clustering of the observations at the publication level. The panel specification groups observations by publications. Models (3) and (4) report the results, respectively, from the pooled tobit and panel tobit regressions where the dependent variable is a one-tail p-value that indicates the continuous significance level of the relationship lending benefits for borrowers. The values that approach one indicate the significance of the beneficial effects for the borrowers; values that approach zero indicate the significance of the non-beneficial effects for the borrowers; values in the range 0.05-0.95 indicate nonsignificant evidence for the borrower benefits. The estimation of the pooled model takes into account the clustering of the observations at the publication level. The panel specification groups observations by publications. Model (5) reports results from the meta-analytic regression analysis with random effects (MARA; Lipsey and Wilson, 2001), which is an extension of the variance-weighted least square regression. Model (6) reports the robust random-effects meta-regression with dependent effect sizes (Hedges et al., 2010). This estimation takes into account the correlation of within-study observations. In both Models (5) and (6) the dependent variable is Fisher's z-score derived from the partial correlations. The positive Fisher's z-scores indicate a positive relation between the strength of the relationship and the benefits for the borrowers, a negative Fisher's z-scores indicate a negative relation between the strength of the relationship and the benefits for the borrowers. The I2 in the meta-regressions denotes the % of residual variation attributable to the between-study heterogeneity. the adjusted R2 in the meta-regressions denotes the proportion of the between-study variance explained by the meta-regression. The Tau2 is the residual maximum likelihood estimation of the between-study variance. All of the variables are defined in Table AII of the appendix. The *, **, *** indicate the coefficients that are significantly different from zero at the 10%, 5%, and 1% levels respectively.

Method:	Logit, pooled (1) Binary borrower benefits (1=yes, 0=no)			Logit, panel with random effects (2) Binary borrower benefits (1=yes, 0=no)			Tobit, pooled (3) one-tailed p-value borrower benefits			Tobit, panel with random effects (4) one-tailed p-value borrower benefits			Meta-regression (5) Fisher's z-score			Robust meta-regression with dep. effect sizes (6) Fisher's z-score		
Dep. Var.:	Coeff.	z	sig.	Coeff.	z	sig.	Coeff.	t-stat	sig.	Coeff.	z	sig.	Coeff.	t-stat	sig.	Coeff.	t-stat	sig.
Primary	0.37	0.92		0.21	0.48		0.05	1.17		0.02	0.48		0.01	0.72		0.00	-0.07	
Author affiliation ranking	-0.01	-1.98	**	-0.01	-1.98	**	0.00	-1.92	*	0.00	-1.31		0.00	-3.23	***	0.00	-1.52	
Banking journal (y/n)	0.94	2.84	***	1.11	2.39	**	0.13	2.49	**	0.09	1.65	*	0.03	4.24	***	0.03	2.55	**
Impact factor	0.24	1.84	*	0.09	0.50		0.05	2.50	**	0.02	1.05		0.00	1.29		0.00	-0.04	
Ln no. of observations	-0.19	-2.60	***	-0.13	-1.35		-0.03	-2.40	**	0.00	-0.33		0.00	-1.88	*	0.00	-0.60	
Constant	2.81	3.35	***	2.93	3.09	***	0.88	8.26	***	0.75	7.12	***	0.07	4.24	***	0.06	1.52	
Country effects	Yes			Yes			Yes			Yes			Yes			Yes		
Rel. lending outcomes	Yes			Yes			Yes			Yes			Yes			Yes		
Rel. strength proxy	Yes			Yes			Yes			Yes			Yes			Yes		
Number of studies	74			71			71			75			71			71		
Number of observations	1,149			1,160			2,117			2,333			2,117			2,117		
McFadden Adj. R2	0.19						0.14											
I2													0.956					
Adj. R2													0.0975					
Tau2													0.0107			0.0131		

TABLE 7

Determinants of nonsignificant results

This table shows the results from the logit regression models where the dependent variable is a dummy that indicates whether the effect size is nonsignificant (1 = nonsignificant effect size, 0 = significant effect size). The significance is determined at the 10% level. Models (1) and (2) use a pooled estimation, Models (3) and (4) use a panel estimation with random effects. The observations are grouped into panels by publications. The pooled models take into account the clustering of observations by publications. The *, **, *** indicate coefficients that are significantly different from zero at the 10%, 5%, and 1% levels respectively.

Method:	Logit, pooled									Logit, panel with random effects					
	(1)			(2)			(3)			(4)					
Dep. Var.:	Nonsignificant effect (1=yes, 0=no)			Nonsignificant effect (1=yes, 0=no)			Nonsignificant effect (1=yes, 0=no)			Nonsignificant effect (1=yes, 0=no)					
	Coeff.	z-stat	sig.	Coeff.	z-stat	sig.	Coeff.	z-stat	sig.	Coeff.	z-stat	sig.			
Published	-0.0407	-0.13					-0.27	-0.83							
Primary				-0.15	-0.62					-0.14	-0.43				
Author affiliation ranking				0.00	0.51					0.00	1.18				
Banking journal (y/n)				0.19	0.71					0.20	0.61				
Impact factor				-0.33	-2.06	**				-0.12	-0.80				
Median sampling year				-0.03	-0.73					-0.03	-0.70				
ISI no. of citations				0.00	-1.76	*				0.00	-0.50				
Ln no. of observations	-0.3824	-5.21	***	-0.28	-3.23	***	-0.55	-9.74	***	-0.48	-6.12	***			
Constant	2.58	3.49	***	57.59	0.77		4.32	7.51	***	59.40	0.75				
Country effects	Yes			Yes			Yes			Yes					
Controls for relationship lending outcomes	Yes			Yes			Yes			Yes					
Controls for relationship strength proxy	Yes			Yes			Yes			Yes					
Number of studies	95			70			95			71					
Number of observations	2,871			2,347			2,871			2,117					
McFadden Adj. R2	0.10			0.11											