

SMEs and Bank Lending Relationships: the Impact of Mergers

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ABSTRACT

This paper studies the impact of bank mergers on firm-bank lending relationships using information from individual loan contracts in Belgium. We analyze the effects of bank mergers on the probability of borrowers maintaining their lending relationships and on their ability to continue tapping bank credit. The Belgian financial environment reflects a number of interesting features: high banking sector concentration; “in-market” mergers with large target banks; importance of large banks in providing external finance to SMEs; and low numbers of bank lending relationships maintained by SMEs.

We find that bank mergers generate short-term and longer-term effects on borrowers' probability of discontinuing a lending relationship and on credit availability. Mergers also have heterogeneous impacts across borrower types, including borrowers of acquiring and target banks, borrowers of differing size, borrowers with single versus multiple relationships, and borrowers with differing relationship intensities. Firms borrowing from acquiring banks are less likely to lose their lending relationship, while target bank borrowers are more likely to lose their relationship or see their credit availability harmed. Overlap borrowers – borrowing from two of the merging banks – are less likely to lose their relationship than firms borrowing from only one of the merging banks or firms borrowing from nonmerging banks.

I. Introduction

The impact of bank mergers on firm borrowers has been a topic of interest for researchers and policy makers for several years. Two main questions have been the subject of inquiry: Do bank mergers harm or benefit firm borrowers? Do bank mergers result in less credit for small firms?¹ In many countries banks are the most important providers of external finance to firms. Banks are especially important for small and medium-size enterprises (SMEs), as they represent these firms' principal source of external finance. Hence, any impact of bank mergers on credit to SMEs may have important policy implications.

Recent banking sector consolidation in countries around the world has increased interest in the effects of bank mergers. In this paper we use data on firm-bank loan contracts from the Belgian credit register to analyze the impact of three major bank mergers, involving fifty-eight percent of banking sector assets, on SMEs' bank lending relationships. Although the literature on the impact of bank mergers on borrowers is rapidly growing, very few studies to date have made use of firm-level data. Those that have analyze mergers in three other countries: Italy (Bonaccorsi di Patti and Gobbi, 2003; Chionsini et al, 2004; Sapienza, 2002; Panetta et al, 2004); Norway (Karceski et al, 2005); and the U.S. (Carow et al, 2004, Drucker, 2005; Erel, 2005; Scott and Dunkelberg, 2003). Like ours, the Italian studies employ credit register data and focus on SMEs. In contrast, the Norwegian study and Carow et al (2004) for the U.S. use firms' stock market returns; therefore, their focus is mainly on large, listed borrowers who also enjoy market sources of finance.²

Although these studies vary in their approach to measuring the impacts of mergers, virtually all report heterogeneous impacts on borrowers with differing characteristics. In particular, banking consolidation appears to generate welfare losses for smaller

¹ For an overview see Berger et al. (1999).

² Scott and Dunkelberg (2003) use survey responses of small U.S. firms regarding the outcome of their most recent loan requests to study the effects of bank mergers. Drucker (2005) focuses on the propensity of medium to large US firms to switch from commercial banks to merged commercial-investment banks. Erel (2005) deals with the effect of US bank mergers on loan prices on new commercial and industrial loan extensions after mergers.

borrowers of merging banks.³ Also, borrowers of target banks (especially small target banks when the acquiring bank is large) seem to be harmed more by mergers.

To the extent that mergers are found to have significant effects on lending relationships, we can presume that the effects are supply-related, since mergers are exogenous from the borrowers' point of view. Bank mergers may improve efficiency – e.g., through cost synergies or by the takeover of an inefficient bank by an efficient one – and increase market power. Any of these may influence the supply of credit to firms. Yet, as Karceski et al (2005) point out, a restriction of loan supply following a merger may harm some borrowers more than others. Those borrowers, for example, who can switch from the merging bank to another will suffer less than those who would have preferred to switch but face prohibitively high switching costs. Even mergers that enhance efficiency through takeovers of inefficient banks can harm the target bank's borrowers if their credit is cut, although other borrowers may not be adversely affected. Only by distinguishing the effects of mergers on different borrower types can the nature of the merger effects and the relative extent of harm or benefit be determined.

We focus our analysis on the differential impacts of mergers on firm borrowers. Like the previous studies on bank mergers, we test for heterogeneous effects, in the short run and the longer run, according to firm size, whether the borrower had a pre-merger lending relationship with the target or the acquiring bank, and whether the borrower had a single versus multiple bank lending relationships prior to the merger.

Unlike previous studies, we distinguish borrowers that had pre-merger lending relationships with both the acquiring and the target bank (i.e., "overlap" borrowers). We also consider the importance of relationship intensity for the multiple-relationship borrowers. With respect to overlap borrowers, we expect that informational gains from combining the assessments of two banks should imply that these borrowers are affected differently by mergers than borrowers of only one merging bank. The

³ A number of studies draw this conclusion on the basis of aggregate, bank balance sheet data. Examples are Berger and Udell (1996), Berger et al (1998), Peek and Rosengren (1996), and Strahan and Weston (1998). See Berger et al (1999).

Belgian context may be conducive to identifying this effect, since the number of bank lending relationships maintained by Belgian firms is low.

The paper closest to ours is that of Sapienza (2002). Like her, we test for merger effects on SMEs by examining the probability of discontinuation of the lending relationship, and we also consider the change in total loan volumes for firms which continue borrowing from the merged bank.⁴ With respect to discontinuation, however, we go a step further, to detect whether the discontinuation of a lending relationship with one bank corresponds to a switch by the borrower to another bank, versus a fall in the number of bank lending relationships.⁵ This distinction is crucial for accurately judging the impact of mergers, especially for firms with single bank relationships. Firms whose single relationship is discontinued without a switch to another bank no longer have bank credit.⁶ To the extent that a merger-induced discontinuation of a relationship is accompanied by a switch by the borrower to another bank, the negative impact on the borrower is arguably lower.

The Belgian environment differs in several respects from the settings of other studies, making it a potentially interesting one for identifying merger effects. First, concentration in the Belgian banking sector has increased significantly and is now very high as a result of the three in-market mergers we examine. Second, large banks are very important in lending to SMEs in Belgium, and were so even prior to the merger wave. This suggests that the impacts of mergers on SMEs may be less pronounced than in other countries, where stronger merger effects are found for small firms.⁷ Third, the mergers that we study all involve large target banks, as well as the more typical feature of large acquiring banks. This also may suggest less of a difference in the effects of mergers on borrowers of acquiring versus target banks than has been reported for other countries. Finally, and unlike Italian SMEs, Belgian SMEs

⁴ Whereas Sapienza (2002) is able to test for a change in interest rates to borrowers continuing on with merged banks, we can only test indirectly for this by using loan volumes as a proxy for interest rates, since information on interest rates is not available in the Belgian credit register data.

⁵ Although Karceski et al (2004) identify borrowers switching banks, they do not control separately in their regressions for discontinuation with and without switching.

⁶ Because the firm-bank lending relationships studied by Sapienza (2002) represent credit lines rather than total bank loans, a discontinuation of a lending relationship, even for a firm with only one credit line, does not necessarily represent a cut off of bank finance for that firm.

⁷ Peek and Rosengren (1996), for example, argue that the impacts of bank mergers on small firms depend upon the previous business strategy of the acquiring bank.

generally maintain low numbers of bank lending relationships. We argue below that a low number of relationships is actually more typical of SMEs in other countries than the mean value of nine lending relationships for Italian SMEs reported by Sapienza (2002). In contrast to the other features of the Belgium environment, the low number of bank lending relationships, including a high proportion of firms with single lending relationships, suggests that bank mergers might be expected to have stronger impacts than in countries where firms maintain many bank lending relationships.

Our main results can be summarized as follows. First, following a merger, borrowers at target banks have higher rates of discontinuation of their lending relationships than borrowers of nonmerging banks, while borrowers of acquiring banks have lower rates of discontinuation. Overlap borrowers have lower discontinuation rates than all of these borrower categories. The result of higher discontinuation rates for target borrowers is similar to results reported by Sapienza (2002) and by Karceski et al (2005). On the other hand, our result for borrowers of acquiring banks appears to be stronger than these authors' findings of either no difference or of only slightly lower discontinuation rates than for non-merging bank borrowers. To our knowledge, no other paper has reported results regarding discontinuation rates for overlap borrowers.

A second result concerns the timing of merger effects, which appear immediately following the merger and become more robust in the longer run. Differences in target and acquirer bank sizes appear to play a role immediately following the merger. The target-bank effect increases with the difference in size between the acquiring and target banks.

A third result relates to target-bank borrowers: those with a single relationship appear to be harmed more than those with multiple relationships. This conclusion follows from the combination of two separate results. First, less than two percent of the single-relationship firms in our sample switch banks, and the rate at which borrowers of target banks switch is no higher than the switching rate for borrowers of nonmerging banks. The vast majority of single-relationship borrowers with discontinued lending relationships "exits" the credit register data, for at least some period of time, meaning that they no longer have bank credit. Second, target bank borrowers with single relationships prior to the merger and who stay on with the

merged bank exhibit a lower increase in loan volumes than do similar borrowers continuing with nonmerging banks. This suggests that the single-relationship, target-bank borrowers face tougher loan terms after the merger than do similar borrowers at nonmerging banks.

In contrast, target-bank borrowers with multiple lending relationships and who stay on with the merged bank do not have lower changes in loan volumes than similar continuing borrowers at nonmerging banks. This suggests that multiple-relationship, target-bank borrowers continuing on with the merged bank either have more bargaining power than their single-relationship counterparts or are better able to hedge against a change in lending policy of the merged bank by relying on other lenders.

A fourth result is that relationship intensity matters for borrowers with multiple-relationships. In general, a higher relationship intensity with the bank (i.e., proportion of total loans borrowed from that bank) translates into a lower discontinuation rate. Interestingly, the lower discontinuation rate for borrowers of acquiring banks than nonmerging banks holds only for borrowers with low relationship intensities. On the other hand, the higher discontinuation rate for borrowers of target banks holds for firms with high relationship intensities.

Since overlap borrowers have relationships with both the acquiring and the target banks, we ask whether relationship intensity with one of the banks matters more than with the other. We find that among overlap borrowers, discontinuation rates are higher for those with very high intensity with the target bank – and, by implication, low intensity with the acquiring bank. Overlap borrowers are also more likely than nonmerging-bank borrowers to add a new relationship (which makes up for the artificial "fall" in relationships due to the merger of the acquiring and target banks).

Fifth, smaller firms are not systematically more harmed by mergers than larger firms, once we control for single versus multiple lending relationships. In our sample, firm size is negatively related to discontinuation rates; larger firms have lower discontinuation rates than smaller firms. Although target borrowers of all sizes, with the exception of the smallest borrowers, face higher discontinuation rates than similar

nonmerging-bank borrowers, the relationship between size and discontinuation rate for target borrowers generally exhibits a U-shape.

Finally, we find no strong evidence that the target banks in our sample, or the firms to whom they extended credit, were performing more poorly than the acquiring banks prior to the merger. Hence, the mergers we study do not appear to have been motivated by inefficiency of the target banks. In light of this observation, our results indicate that mergers have harmful effects on target borrowers – especially those with single lending relationships – and potentially beneficial effects on acquiring bank and overlap borrowers. Very few borrowers switch to a new bank when a lending relationship is discontinued; hence, the mergers appear to have reduced the availability of bank finance for single-relationship target borrowers.

The remainder of the paper is organized as follows. Section II formulates hypotheses concerning the differential impacts of bank mergers on firm borrowers. Section III describes the banking environment and discusses sources of data. Section IV presents the results of regressions testing the impact of mergers on the probability of losing a relationship, while Section V deals with credit availability. Section VI concludes.

II. Effects of bank mergers: hypotheses

In general, bank mergers can lead to efficiency gains that, when passed on, reduce prices and increase borrower welfare. At the same time mergers may increase market power, increase prices, and lower borrower welfare.⁸

Our focus is on heterogeneous impacts of bank mergers on firm borrowers. Bank mergers may tilt the supply of credit and generate heterogeneous impacts on borrower welfare. One potential source of heterogeneity is a change in business strategy of the consolidated bank in comparison with that of one (or both) of the merging banks. Heterogeneity may also stem from differences in the bargaining power firms have within their established bank-firm relationships and within the financial system. The

⁸ Sapienza (2002), who studies the effects of Italian bank mergers on borrowers' credit lines, finds that interest rates decrease after bank mergers, suggesting an efficiency effect. However, this efficiency effect is offset by a market power effect when the market share of the acquiring bank is substantial.

hypotheses below identify a number of expected impacts of bank mergers on different categories of firm borrowers.

Hypotheses: *After bank mergers, relationships are more likely to be discontinued and loan volumes more likely to decrease:*

- a) at target banks than at acquiring banks,*
- b) for small firms than for large firms,*
- c) by firms with lower switching costs than by other firms*
- d) for firms borrowing from only one merging bank, rather than overlap borrowers*

Hypothesis a) refers to differences between borrowers at *acquiring versus target banks*, suggesting that borrowers at target banks are more likely to see their relationship negatively affected. Borrowers of target banks will be harmed when: (1) the target bank before the merger was granting below-cost loans, or (2) the merged bank adopts the strategic focus and the organizational structure of the acquiring bank (Peek and Rosengren, 1996; Houston et al, 2001). In addition, soft information available at the target bank may be lost if key employees leave the consolidating bank or move within the new organization.

Hypothesis b) is related to the “*size effect of lending*” (see e.g. Stein (2002)). Mergers increase bank size, and larger banks typically have a more hierarchical organizational structure than small banks. Large banks may concentrate on larger firms, and reduce the amount of lending to small businesses (see also Strahan and Weston, 1998, and Peek and Rosengren, 1996). This may be driven by the fact that: (1) servicing large versus small firms is entirely different (transactional lending versus relationship lending; also see Petersen and Rajan (1994, 1995)); or (2) small banks have a better technology for servicing small firms (see also Cole et al, 2004, and Udell, 1989).

Hypothesis c) focuses on demand side effects that relate to the magnitude of “*borrower switching costs*”, which determine how advantageous it is for firms to switch banks versus being locked-in (see e.g. Karceski et al, 2005; Degryse and Ongena, 2005; or Kim et al, 2003; Klemperer (1995) provides a review of switching

costs).⁹ Whereas firms with low switching costs could more easily leave the merged bank if interest rates rise as a result of the merger or if other banks start to actively poach borrowers from merged banks, firms with high switching costs may have to continue with the consolidated bank. We expect that larger and more profitable firms, and firms with multiple relationships have fewer problems in credibly communicating their value to other financiers. Moreover, target-bank borrowers with multiple relationships may be better able to hedge against a change in lending policy of the merged bank by relying on other bank lenders.¹⁰ In addition to the number of relationships, relationship intensity may play a role in the size of the target effects: firms with strong relationships with the target bank may find it more difficult to hedge against changes in lending policies.

Hypothesis d) states that *overlap borrowers* are less likely to lose their relationship and have their loan volumes decreased than firms borrowing from only one merging bank. Several arguments may be cited in support of this conjecture. First, the number of firm-bank relationships “mechanically” decreases for firms borrowing from at least two of the merging banks. Firms facing such a “drop in number of relationships” may face incentives to increase this number again, and may be less inclined to drop their relationship at the consolidated bank (see e.g. Carletti (2004) and Detragiache et al. (2000) on the optimal number of relationships).¹¹ This force is absent for firms borrowing from only one of the merging banks.¹² Second, mergers may also improve a bank’s information about borrowers. Panetta et al. (2004) argue that the consolidated bank should be able to better tailor interest rates of firms borrowing from several merging banks to the firm's riskiness, either as a result of improved informational abilities in distinguishing borrower quality or the pooling of

⁹ Firms face different kinds of switching costs. “Informational” switching costs stem from the fact that an inside bank possesses an informational advantage vis-à-vis outside banks. Firms willing to switch banks might be perceived of lower quality and therefore pay a higher loan rate. “Transactional” switching costs refer to higher costs that are incurred in visiting another bank. Examples of the latter are differences in geographical convenience, paperwork, different standards at banks etc.

¹⁰ In the context of banks facing liquidity shocks, Khwaja and Mian (2005) find that only firms with multiple banking relationships are able to fully compensate for the liquidity shock by borrowing from more liquid banks.

¹¹ Admittedly, in a world without frictions, firms could simply choose to substitute the two merging banks with two other banks.

¹² Also the consolidated bank has incentives to revisit the position of the firms. For example, it may force out very large firms as the entire exposure to the firm may exceed certain limits. As our focus is on SMEs, we expect that this argument is not at play.

information by the merging banks.¹³ Finally, an effect which could work in the opposite direction of our hypothesis is that outside banks bidding for borrowers having loans with two of the merging banks now face an increased winner's-curse effect, which yields the consolidated bank additional market power (see e.g. Hauswald and Marquez, 2003; or von Thadden, 2004).

III. Banking environment and description of data

In this section we provide information about the Belgian banking environment and the data sources for our analysis. We document an increase in banking sector concentration from the three bank mergers we examine, the importance of large banks in lending to small firms in Belgium, the low number of bank lending relationships maintained by Belgian SMEs, and a decline in the number of lending relationships over time. We also provide summary statistics for the firms and banks in our data set.

III.1 Banking environment and bank-firm lending relationships

Concentration in the Belgian banking sector has steadily increased over the past decade and is currently quite high. Indeed, every large bank currently operating in the Belgian banking sector has been involved in some type of merger or acquisition in the past ten years. Table 1 shows the Herfindahl index and the four-bank concentration ratios for loans to firms reported in the credit register in 1997 and 2003, where the market shares are reported for all firms and separately for different size categories as defined in the Basel II accord (corporates, corporate SMEs and retail SMEs).¹⁴ The increase in the Herfindahl index reflects the effects of the mergers that we analyze in

¹³ These authors find that after a merger, the relation between the default probability of a firm and its loan rate becomes steeper.

¹⁴ Corporates are defined in the Basel II accord as firms with greater than 50 million Euro in annual sales; SMEs have sales below 50 million Euro. (Subject to national discretion, the Basel Committee allows substituting the value of assets for sales when the latter is unavailable.) In addition, retail SMEs are those SMEs for which the total exposure of any single banking group to the firm is less than 1 million Euro.

this paper.¹⁵ The share of large banks in loans to firms has increased across all size categories, including the smallest firms.¹⁶

Table 1: Herfindahl index and four-bank concentration ratios in loan exposures to firms by Basel II firm size category

	Dec-97	Dec-03
Herfindahl index	0.12	0.22
Concentration ratios		
<i>All firms</i>	58.0	88.5
<i>Corporate</i>	49.9	77.7
<i>Corporate SME</i>	54.4	85.9
<i>Retail SME</i>	71.4	91.0

Source: Credit register.

Table 2 presents summary statistics on the number of bank lending relationships maintained by Belgian firms in 1997 and in 2003, again broken down by Basel II firm-size category. This table shows that the average number of bank lending relationships for all firms taken together is low, although the number of lending relationships increases with firm size.¹⁷ The average number of bank lending relationships for firms in each size category has declined over time.¹⁸

¹⁵ Our analysis focuses on the three major banking mergers that occurred during this period. Although there were thirteen other banking mergers among small banks where at least one of the banks involved reported loans to the credit register, all of these mergers involved only a few firms. In particular, the average number of borrowers involved per merger was only 124 and the maximum number of borrowers in any merger was 362.

¹⁶ Cetorelli and Gambera (2001) report the three-bank concentration ratios in different countries over the period 1989-1996. They find that the three largest banks account for 49 percent of total assets in Belgium, 15 percent in the US, 24 percent in Italy, 27 percent in Germany, and 50 percent in the United Kingdom. Of course, in countries like the US or Italy, banks concentrate their activities in specific geographic areas, implying that some local markets are also highly concentrated in these countries. Nevertheless, the evidence by Cetorelli and Gambera (2001) illustrates that the Belgian market was already quite concentrated before the starting date of our sample.

¹⁷ A relationship exists when firms are “currently” lending from a bank. This relationship measure may be narrower than the ones used in other, survey-based studies looking at the number of relationships in Belgium, where also “past” lending or other services may be taken into account (see e.g. Ongena and Smith, 2000, or de Bodt, Lobež and Statnik, 2002). However, Belgium seems not to be an exception in having a low number of bank relationships. Results for France indicate that about 60% of firms having sales of less than € 2.5 million have one bank lending relationship (Dietsch and Golitin-Boubakari, 2002, credit register data for 2000). In Portugal, about 57% of firms has a unique relationship (Farinha and Santos, 2000, credit register data for 1995).

¹⁸ Data for the intermediate years of our sample confirm the steady decline in the average number of lending relationships across all size categories of firms. For example, the average number of lending

Table 2: Numbers of firms and numbers of bank relationships by Basel size category

	N	Mean	Median	Min	Max	Std. dev.
1997						
Total	100 432	1.30	1	1	16	0.70
Corporate	904	3.31	3	1	15	2.44
Corporate SME	5 397	2.02	2	1	16	1.29
Retail SME	94 131	1.24	1	1	7	0.54
2003						
Total	122 904	1.21	1	1	9	0.53
Corporate	997	2.30	2	1	9	1.42
Corporate SME	6011	1.72	1	1	9	0.95
Retail SME	115 896	1.17	1	1	5	0.45

Source: Credit register

III.2 Data sources and summary statistics

We rely on three sources of data for our analysis:

- (1) Data from the *credit register*, which contains information on loans to Belgian firms granted by banks operating in Belgium.¹⁹ Our data cover the period 1997-2003 and contain both authorised and utilised volumes by type of loan by bank.²⁰ The banks represented in the data include all foreign and domestic banks operating in Belgium which had either authorised or outstanding loans during the period to non-financial firms. Loans to Belgian firms that were extended by foreign banks or branches outside of Belgium are not included in the data set. Also, the credit register contains no data on interest rates or collateral. Banks obtain aggregate information from the credit register about their own borrowers or loan applicants. In 2003, 70 banks were reporting to the credit register.

relationships for all firms in each of the years 1998-2002, respectively, are: 1.28; 1.26; 1.25; 1.23; 1.22. In previous work (see Degryse et al, 2004), we have investigated the determinants of the number of firm-bank relationships for the years 1997 and 2002. The determinants were quite stable over time, suggesting that other structural changes in the financial sector may explain the drop in the number of relationships.

¹⁹ Banks must report to the Belgian credit register information relating to total exposures to individual firms above € 25,000. The reporting requirement for the Italian credit register is about € 75,000. About 45% of firms in our sample have total exposures < € 75,000. Our results remain robust when only including firms with exposures of more than € 75,000.

²⁰ We rely on utilised loan volumes for our analysis, on the assumption that bank lending relationships are more likely to be valuable to firms and to banks to the extent that lending actually occurs. In addition, firms with utilised loan volumes equal to zero are included in the credit register data; hence,

- (2) *Firm balance sheets*. These data come from firms' annual balance sheet filings during the period 1994-2002.²¹
- (3) *Bank balance sheets*. These contain annual balance sheet data, which banks are required to report under the Supervisory Reporting Scheme (Schema A). These data are available from 1992-2003.

While the credit register data offer a unique source of information relating to firms' bank lending relationships and loan volumes, the limitations of these data suggest some restrictions for our analysis. Most importantly, because the credit register data include only banks operating on Belgian territory and thus exclude loans to Belgian firms from foreign banks operating outside of Belgium, it is possible that the number of bank relationships for large firms is understated. This suggests restricting our attention to small and medium-size firms. In all of the analysis that follows, we have excluded all firms meeting the Basel II classification of "corporate" (i.e., with sales exceeding 50 million €), as well as all firms with assets exceeding 500 million €.²²

We construct a panel consisting of observations of firm-bank lending relationships in December of each of the years 1997-2003. Like Sapienza (2002), we focus on "continuing" firms – that is, firms that had at least one bank lending relationship at the beginning of the panel; i.e., in December, 1997. These firms are included for every year of the panel (unless the relation is terminated, in which case the observation disappears). Because we are interested in observing the effects of mergers on firms that were borrowing from merging banks prior to the merger (and comparing them with firms borrowing from nonmerging banks prior to the merger), it would bias our results to include newly entering firms into the panel during the year of a merger. Table 3 presents summary statistics for the firms and in our panel.

including these firms is similar to using authorised loans. Our results remain robust to the exclusion of firms with zero utilized loan volumes.

²¹ Small and medium-size firms in Belgium are allowed to file a short balance sheet form, which is less complete than the long form required for large firms. Hence, certain data such as sales and number of employees (for which reporting is voluntary on the short form) are not available for all firms. As a result, we rely on the book value of assets as a measure of firm size.

²² The Belgian economy has a large number of coordination centers. These are generally subsidiaries of international firms that have been established in Belgium to benefit from tax advantages. They carry out activities for other group entities such as centralization of accounting, administration, and financial transactions. Because coordination centers do not behave like typical firms, they have also been excluded from our regression analysis.

Table 3. Panel summary statistics: firm characteristics

Summary statistics for firms are based upon all firm-year observations included in the panel data analysis, which consists of yearly observations from Dec., 1997-Dec., 2003. Assets are in thousands of € (2002 values). All variables definitions are provided in the Appendix.

	N	Mean	Median	Std. Dev.
<i>All firms</i>				
AGEF	472.109	11.65	11.96	10.,27
ASSETF	472.109	1 752	498	8 954
ROAF (*)	472.109	5.97%	5.37%	10.86%
LEVERAGE(**)	472.109	75.12%	74.85%	38.67%
<i>Firms borrowing from acquiring bank in year prior to merger</i>				
AGEF	47 244	10.59	10.56	10.11
ASSETF	47 244	1588	504	7825
ROAF (*)	47 244	5.75%	5.26%	10.80%
LEVERAGE(**)	47 244	75.03%	75.21%	37.40%
<i>Firms borrowing from target bank in year prior to merger</i>				
AGEF	12 737	8.40	9.00	9.35
ASSETF	12 737	1638	339	10 006
ROAF (*)	12 737	5.79%	5.46%	11.51%
LEVERAGE(**)	12 737	78.13%	77.59%	41.28%
<i>Overlap firms (borrowing from both target and acquiring banks) in year prior to merger</i>				
AGE	1588	14.36	13.98	13.81
ASSETF	1588	6691	1347	21 523
ROAF (*)	1588	6.10%	5.21%	8.27%
LEVERAGE(**)	1588	72.80%	74.78%	24.12%

(*) Firms with ROA > 99 % and < - 99% are excluded.

(**) Firms with Debt/Equity > 1000 % are excluded.

Table 3 shows that the median firm has an age of about 12 years; 498.000 € of total assets in 2002 € ; a return on assets of about 5.4%; and leverage – defined as the book value of debt over assets – of 75 percent. Table 3 also reports summary statistics for different groups of firm-bank relationships: firms borrowing from an acquiring bank in a merger (but no other bank involved in the merger); firms borrowing from a target bank in a merger (but no other bank involved in the merger); firms borrowing from both the acquiring and a target bank in a merger (“overlap” borrowers). This table indicates few differences in the characteristics across groups. Firms borrowing from target banks are slightly younger and have slightly higher leverage than other firms. Also, overlap borrowers are older and considerably larger than other firms; however,

their profitability (ROAF) and leverage are similar to the values for firms in other groups.

Our three in-market mergers relate to the creation of Dexia, Fortis and KBC. Each of the three mergers eventually resulted in a reduction in the number of branches of the consolidated bank by almost one half, mainly due to geographical overlap. Interviews with representatives of the consolidated banks indicated that, although no specific closure policy – relating to acquiring versus target bank – was pursued, it was often more likely that, due to the larger size of the acquiring bank: (1) the branch of the acquiring bank was kept on, as the space in that branch was large enough to physically accommodate the activities of the consolidated branches; and (2) the branch head often came from the acquiring bank, because this person had experience in overseeing a larger group of relationship managers. The interviewees revealed no explicit merger motives.

Table 4 reports bank characteristics for all banks in our panel and for the acquiring and target banks at the time of the merger. We observe that acquiring and target banks are larger than other banks in the sample. They also have slightly higher returns on assets, operating cost ratios, and ratios of liquid assets to total assets. These statistics suggest that the mergers we analyze were not motivated by underperformance of the target banks.

Table 4 Summary statistics for banks

Bank summary statistics are based upon all bank-year observations included in the panel. Asset values are in thousands of € (2002 values). All variables definitions are provided in the Appendix. Acquiring and target bank statistics are at the time of the merger.

	N	Mean	Std. Dev.
<i>All banks</i>			
ASSETB	500	8 808 294	30 219 522
ROAB	500	0.16%	1.51%
BADLOANSB	500	1.95%	3.21%
OPCOSTB	500	8.77%	6.78%
LIQB	500	10.83%	39.07%
<i>Acquiring banks</i>			
ASSETB	3	95 670 164	188 000
ROAB	3	0.27%	0.14%
BADLOANSB	3	1.29%	1.06%
OPCOSTB	3	9.28%	7.52%
LIQB	3	15.11%	3.52%
<i>Target banks</i>			
ASSETB	5	34 037 556	216 000
ROAB	5	0.29%	0.22%
BADLOANSB	5	1.33%	1.15%
OPCOSTB	5	9.19%	5.69%
LIQB	5	17.66%	16.99%

IV. Empirical Analysis

In this section we test the hypotheses developed in Section II. The general question is whether a merger affects borrowers from merging banks differently. In essence, this question asks: (1) whether borrowers of merging banks are treated differently from borrowers of banks not involved in mergers and also (2) whether borrowers of merging banks are treated differently by the consolidated bank than they were by the individual (merging) banks prior to the merger, in the short run or the longer run.

As described in Section II, we analyze the three major bank mergers that occurred from 1997-2003. Each of these mergers involved at least two large banks. We take the date of the merger as that on which the merged bank began providing unified credit statistics to the credit register, which is the date of the legal merger. Our classification of whether a bank is an acquirer or target is based on the classification provided by the Belgian Banking and Finance Commission (CBFA) in their annual reports.

We perform a panel regression analysis to investigate merger effects. This allows us to identify “combined” effects of the mergers, to control for time effects, to control for merging-bank behavior prior to the merger, and to differentiate short-term versus longer-term merger effects.²³

IV.1 Regression specification

Our specification is a logit-regression, where the dependent variable *DISCONTINUE* is a forward-looking dummy variable, which takes the value 1 if the relationship between the firm and the bank is discontinued during the twelve-month period following the time of the observation.

We estimate the following logit specification:

$$\ln \left[\frac{p(DISCONTINUE_{ikt} = 1)}{1 - p(DISCONTINUE_{ikt} = 1)} \right] = \alpha_0 + \alpha_1 MERG1_{kt} + \alpha_2 MERG2_{kt} + \alpha_3 MERG1_{kt-1} + \alpha_4 MERG2_{kt-1} + \beta(firmcontrols)_{it-1} + \gamma(bankcontrols)_{kt-1} + \varepsilon_{ikt} ,$$

where each observation represents a firm-bank relationship and where *DISCONTINUE*_{ikt} equals one if during the twelve months following time *t*, the relationship between firm *i* and bank *k* was discontinued. The variables *MERG1*_{kt} and *MERG2*_{kt} are dummy variables that allow us to identify common effects on firms that were borrowing from banks involved in a merger. *MERG1*_{kt} is a dummy variable which equals one if bank *k* was involved in a merger in the twelve months following time *t* and if firm *i* was not borrowing from any of the other banks involved in the merger. *MERG2*_{kt} is a dummy variable equal to one if bank *k* was involved in a merger in the twelve months following time *t* and firm *i* was an overlap borrower; that is, the firm was borrowing from, in addition to bank *k*, at least one of the other banks involved in the merger. These two variables allow us to distinguish the effects of mergers for firms borrowing from only one of the merging banks versus overlap firms.

²³ We have also run regressions for each merger individually in order to identify heterogeneity across mergers. Most of the merger results were also present for all individual mergers.

Because each of the three mergers covered by our panel occurred roughly in the middle of a year, using observations in December in each year for the panel allows us to measure the “short term” merger effects as those occurring in a twelve-month period around the merger, including six months following the merger. That is, if a merger occurred in June, 1998, the value of $MERG1_{kt}$ (together with DISCONTINUE) for t =December, 1997 indicates whether the firm borrowing from one bank involved in the merger lost its relationship or not with the merged bank in the six months following the merger.

To investigate “longer-term” effects of mergers, we introduce the dummy variables $MERG1_{kt-1}$ and $MERG2_{kt-1}$, which are defined similarly to the short run merger variables but which equal one when firm i was borrowing from one or two merging banks at time $t-1$ (and when the merger occurred between time $t-1$ and t), respectively.²⁴ These dummy variables capture the effects of mergers during the period of six months to eighteen months following the merger, which we from now on call longer-term effects.²⁵

We include firm and bank control variables in the logit regression, as well as industry and year dummies. As firm controls we include measures of firm age, size, profitability, leverage, and year of most recent filing of balance sheet. The motivation for these control variables comes from the previous merger literature and literature on the determinants of number of relationships (see e.g. Farinha and Santos, 2002; Detragiache et al, 2000; Ongena and Smith, 2000), as well as our own estimates with Belgian data (see Degryse et al, 2004). Older, larger and more profitable firms may have lower switching costs in that more public information is available about them. Leverage is introduced to control for certain demand factors. We expect that more levered firms are less likely to lose a lending relationship. However, firms that are too highly levered (e.g., financially distressed firms) may be more likely to lose a relationship. In the same spirit we introduce the year of most recent balance sheet

²⁴ For the example of the June, 1998 merger the variable $MERG1_{kt-1}$ would equal one for the observation $t = \text{Dec.}, 1998$ for firms that had been borrowing from the merging bank in Dec., 1997.

²⁵ The short duration of our panel, combined with the large proportion of banking assets involved in mergers, prevents us from estimating the effects of mergers over a longer period following the merger.

filing. We suspect that halting the filing of balance sheets is one of the steps on the way to a firm's exit, either through bankruptcy or voluntary liquidation.

Bank controls are also included in the regression, since the discontinuation of a relationship may also relate to bank specific characteristics. Bank controls include measures of size, profitability, cost efficiency, bad loans, and liquidity (all variable definitions are provided in the Appendix). For example, Detragiache et al (2000) argue that bank liquidity is important for the continuation of firm-bank relationships. Berger et al (2004) find that large US banks tend to have shorter relationships. Year and industry dummies are introduced to control for business cycle effects and industry effects, respectively.²⁶

The regression results are displayed in Table 5. We report regressions separately for different samples: all firms, firms with a single bank relationship (single rel.), and firms with multiple bank relationships (multiple rel.).²⁷ The two sub-samples – single relationships and multiple relationships – are motivated by Hypothesis c : multiple relationship firms may have lower switching costs.

²⁶ Our time dummies may also control for changes in the competitive environment over time.

²⁷ The reader may notice that our sample splits (single relationships and multiple relationships) allow firms to move from one sample to another sample due to merger related effects. If a firm was borrowing from only two banks, both of which were involved in a merger, then the firm automatically

Table 5: Panel regressions: impact of mergers on lending relationships

The dependent variable in each regression equals one if during the following year firm i discontinues its relationship with bank k . The reported coefficients are logit estimates of a marginal change in the independent variable on the probability of losing the lending relationship. All regressions include a constant term, firm industry dummies, and year dummies (not reported). Definitions of the variables are provided in Section III. *, **, *** denotes significance at the 10, 5, and 1%-level, respectively (based on heteroskedastic-robust standard errors).

PANEL	A			B		
	Without merging bank fixed effects			With merging bank fixed effects		
	Sample			Sample		
	All	Single rel.	Multiple rels.	All	Single rel.	Multiple rels.
Firm controls						
ln(AGEF)	-0.002***	0.003***	-0.012***	-0.002***	0.002***	-0.011***
ln(ASSETF)	-0.022***	-0.028***	-0.020***	-0.022***	-0.029***	-0.020***
ROAF	-0.084***	-0.076***	-0.086***	-0.083***	-0.076***	-0.086***
LEVERAGE	-0.062***	-0.075***	-0.035***	-0.062***	-0.075***	-0.035***
LEVERAGE*NEGEQ	0.056***	0.063***	0.044***	0.056***	0.063***	0.044***
RECBALANCE	-0.041***	-0.056***	-0.036***	-0.041***	-0.056***	-0.036***
YOUNG	0.015***	0.023***	0.007	0.016***	0.022***	0.006
CONC	-0.195***	-	-0.196***	-0.196***	-	-0.195***
Merger variables						
MERG1 _{t}	-0.006***	-0.001	-0.014***	-0.002***	0.003*	-0.008***
MERG2 _{t}	-0.101***	-	-0.104***	-0.104***	-	-0.102***
MERG1 _{$t-1$}	0.008*	0.005**	-0.001	-0.010*	0.011***	0.006
MERG2 _{$t-1$}	-0.074***	-	-0.065***	-0.078***	-	-0.076***
Bank controls						
ln(ASSETB)	-0.021***	-0.015***	-0.026***	-0.021***	-0.015***	-0.025***
ROAB	0.604***	1.137***	0.440**	0.397***	0.673***	0.410***
BADLOANSB	0.901***	1.278***	0.631***	0.692***	0.555***	0.964***
OPCOSTB	0.289***	0.287***	0.219**	0.248***	0.312***	0.193***
LIQB	-0.034***	0.003**	-0.041***	-0.030***	0.012	-0.043***
Merging Bank dummies	No	No	No	Yes	Yes	Yes
Other variables						
Single rel dummy	-0.042***	-	-	-0.043***	-	-
DISCONTINUE = 1	77 026	44 669	32 357	77 026	44 669	32 357
DISCONTINUE = 0	534 485	318 655	215 830	534 485	318 655	215 830
Pseudo R ²	5.71%	5.27%	8.04%	5.83%	5.49%	7.83%
Chi-Square	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

has a single relationship after the merger (if its lending relationship is not severed). We control for this effect by classifying firms according to the number of lending relationships prior to the merger.

Panel A of Table 5 presents the results without merging bank fixed effects; Panel B includes merging bank fixed effects.²⁸ Results are broadly consistent across these two specifications. All reported coefficients are the marginal effects, computed on the basis of the regression coefficients, on the probability of discontinuing the lending relationship. The average discontinuation rate in our sample is 12.6 percent.²⁹ We discuss first the results for firm and bank control variables, then we turn to the merger variables.

Firm controls. For convenience, we base our discussion on the "All" regression with merging bank fixed effects of Panel B, Table 5. Where there are differences with respect to the other samples, we point them out. All of the firm control variables are statistically significant, and all of these variables are economically significant, with the exception of firm age ($\ln(\text{AGEF})$), whose sign also differs for firms with single and multiple relationships. The discontinuation rate decreases with firm size (ASSETF), profitability (ROAF), and leverage (LEVERAGE). An increase in the log of firm assets by one standard deviation from its mean causes the probability of losing a lending relationship to decrease 3.0 percentage points below the average sample discontinuation rate of 12.6%. This result contrasts with results obtained by Sapienza (2002), who finds a positive relationship between firm size and discontinuation rate, but is in line with Karceski et al. (2005).³⁰ Smaller firms in our sample tend to have less stable relationships with their banks than do large firms.

As expected, higher firm profitability (ROAF) reduces the discontinuation rate. An increase of ROAF by one standard deviation from its mean lowers the discontinuation rate by 0.9 percentage points. However, firms that are too highly levered (those with negative equity; $\text{NEGEQ}=1$), those that have not yet filed a full-year balance sheet

²⁸ Each of these specifications involves some bias. The regression without merging bank fixed effects does not control directly for a change in behaviour of the merging banks pre and post-merger. On the other hand, the regression with merging bank fixed effects can only control for the fixed effects for two of the three mergers, as one of the mergers occurred too close to the beginning of our panel to allow us to control for the pre-merger behavior of the merging banks.

²⁹ In line with this rate, Degryse and Van Cayseele (2000) report a mean duration of the lending relationship for Belgian firms of 7.87 years. A 12.6 percent drop translates into a duration of the lending relationship in between 5 to 6 years, when assuming constant duration dependence. For comparison, the drop rate in Karceski et al (2005) is 6.9 percent and only 3 percent in Sapienza (2002). However, Chionsini et al (2004), who also use Italian data, report a drop rate of around 11 percent.

(YOUNG=1), and firms which have halted filing balance sheets (RECBALANCE=0) are more likely to discontinue their relationship. In sum, these results clearly indicate that firm variables are important in explaining termination of lending relationships.

Relationship intensity between firm i and bank k is measured by the proportion of total utilized loans by firm i accounted for by bank k (CONC). Support for the inclusion of this variable comes from Elsas (2005), who finds that the concentration of a firm's loans with a given bank is an important determinant of the intensity of a relationship. For the multiple relationship firms in our panel, the variable CONC has a mean of 0.44 and standard deviation equal to 0.33.³¹ The results in Table 5 indicate that greater relationship intensity significantly reduces the discontinuation rate. For example, for the multiple relationships sample of Panel B, a one-standard deviation increase in CONC above the mean causes the drop rate to fall by 6.4 percentage points.

Bank controls. All bank control variables are statistically significant. Table 5 shows that borrowers of larger banks tend to have a lower discontinuation rate ($\ln(\text{ASSETB})$): a one standard deviation increase in bank size from its mean lowers the discontinuation rate by 3.2 percentage points. This result contrasts with the findings of Berger et al (2005), who report that in the U.S. larger banks tend to have shorter relationships with borrowers than do smaller banks. How can these different findings be reconciled? Berger et al (2005) interpret their findings as evidence of small banks being better able to handle soft information. Soft information binds a borrower to its bank over time and leads to longer relationships and lower drop rates. Since large banks in our sample appear to have lower rates of discontinuation, our evidence suggests that large banks in Belgium may also deal with soft information. This is consistent with our earlier observation that large Belgian banks are important in lending to SMEs.

The return on assets of banks (ROAB) appears in Table 5 with a (counterintuitive) positive coefficient, but its economic impact is low. Bank liquidity (LIQB) appears in

³⁰ This result reflects in part the fact that very small firms are included in the Belgian credit register. For example, if we restrict our sample of firms to those satisfying the requirement for inclusion in the Italian credit register, the relation between size and discontinuation rate becomes positive.

the different regressions with different signs and also is not economically significant. The remaining two bank characteristics, BADLOANSB and OPCOSTB, indicate that firms borrowing from banks having relatively higher proportions of non-performing loans over total loans and larger operating costs over total assets have higher discontinuation rates.

Merger variables. Table 5 shows that mergers have significant effects on the discontinuation rate. The coefficients on the "short-run" effects $MERG1_t$ and $MERG2_t$ are generally negative and significant, although the result for $MERG1_t$ is slightly less consistent across regressions. So, for example, in the "All" sample with merging bank fixed effects (Panel B), firms borrowing from only one merging bank have a drop rate in the six months following the merger that is lower by 0.2% than for firms borrowing from nonmerging banks, and overlap borrowers have a drop rate that is 10.4% lower than nonmerging bank borrowers.

Support for the interpretation that merger effects occur over time is given by the longer run merger effects (those occurring between six and eighteen months following the merger), which are reflected by the coefficients on $MERG1_{t-1}$ and $MERG2_{t-1}$. The coefficient on $MERG1_{t-1}$ is positive and significant for firms with single lending relationships (the single relationship sample). The sign of the coefficient on $MERG1_{t-1}$ for the entire sample ("All") depends on whether we control for merging bank fixed effects. On the other hand, the coefficient on $MERG2_{t-1}$ is negative and significant for all regressions. These results again suggest that mergers have effects, but the effects may differ for borrowers that were borrowing from only one of the merging banks versus overlap borrowers (consistent with Hypothesis d). Firms with single relationships borrowing from only one of the merging banks have higher discontinuation rates following the merger; however, overlap firms have significantly lower discontinuation rates than firms borrowing from nonmerging banks, and this effect is very strong. Furthermore, overlap borrowers are more inclined to add new relationships and make up for the artificial "fall" in their number of relationships. In particular, overlap borrowers have a probability of about 9% to add a new relationship in the year after the merger compared to only 4% for nonmerging bank borrowers.

³¹ By definition, CONC is equal to 1 for single relationship firms.

Our results contrast somewhat with those obtained by other studies. For example, Sapienza (2002) finds that firms borrowing from merging banks have a probability of losing their relationship that is higher by 1.3% than for nonmerging bank borrowers. Furthermore, most of this effect seems to occur only about four quarters after the merger. Our results indicate that merger effects appear in the short run and that firms borrowing from banks involved in mergers were *less* likely than firms borrowing from nonmerging banks to lose their lending relationship. These results might suggest that the mergers under investigation were, on average, beneficial to firm borrowers.

IV.2 Target versus acquiring bank borrowers

Table 6 reports the results of the regressions addressing the question of potentially different merger effects of borrowers or target and acquiring banks (Hypothesis a). We replace the merger variable $MERG1_t$ from the earlier regressions with two variables ACQ_t and $TARG_t$, representing the short run merger effects for firms borrowing only from an acquirer bank involved in a merger and not the target bank (but maybe a nonmerging bank) and vice versa. Instead of the variable $MERG2_t$, we now include the variable $ACQTARG_t$, which represents firms that were borrowing from both the acquiring bank and at least one target bank (i.e., overlap borrowers). Similar variables, with $t-1$ subscripts, are defined to capture the longer run effects. Because the coefficients for the firm and bank controls are similar to those reported in Table 5, we report here and in all subsequent tables only the marginal effects for the merger variables.

Table 6: Panel regressions: target versus acquirer banks

The dependent variable in each regression equals one if during the following year firm i discontinues its relationship with bank k . The reported coefficients are logit estimates of a marginal change in the independent variable on the probability of losing the lending relationship. All regressions include a constant term, firm industry dummies, and year dummies (not reported). Definitions of the variables are provided in Section III. *, **, *** denotes significance at the 10, 5, and 1%-level, respectively (based on heteroskedastic-robust standard errors).

PANEL	A			B		
	Without merging bank fixed effects			With merging bank fixed effects		
	Sample			Sample		
	All	Single rel.	Multiple rels.	All	Single rel.	Multiple rels.
ACQ_t	-0.014***	-0.007***	-0.025***	-0.010***	-0.005**	-0.017***
$TARG_t$	0.017***	0.018***	0.022***	0.016***	0.023***	0.012
$ACQTARG_t$	-0.105***		-0.110***	-0.104***	-	-0.103***

ACQ _{t-1}	-0.025***	-0.024***	-0.029***	-0.020***	-0.020***	-0.018***
TARG _{t-1}	0.075***	0.066***	0.077***	0.075***	0.075***	0.068***
ACQTARG _{t-1}	-0.084***	-	-0.073***	-0.073***	-	-0.065***
Firm controls included	Yes	Yes	Yes	Yes	Yes	Yes
Bank controls included	Yes	Yes	Yes	Yes	Yes	Yes

We again base our discussion on Panel B, which includes merging bank fixed effects. In terms of the short-run merger effects, an interesting heterogeneity between borrowers from acquiring and target banks appears. For example, the results for the “All” sample show that borrowers of acquiring banks have a lower discontinuation rate (-1.0 %) than borrowers of nonmerging banks, while borrowers of target banks have a higher discontinuation rate (+1.6%)³². Overlap borrowers have a lower discontinuation rate (-10.4%) than firms borrowing from nonmerging banks.

The longer run marginal effects of mergers provide further support for these results and appear to be more robust. Firms borrowing from an acquiring bank have a lower probability (-2.0%) of losing their relationship during the six to eighteen months following mergers than borrowers of nonmerging banks. Firms borrowing from a target bank have a higher discontinuation rate (+7.5%) than otherwise identical nonmerging bank borrowers.

These results are consistent with findings of Sapienza (2002) and Karceski et al (2005), who report that borrowers from target banks in Italy and Norway, respectively, are more likely to lose their relationship. However, neither of these studies finds the rate of termination of bank lending relationships for borrowers of acquiring banks to be much different from the rate for borrowers of nonmerging banks. We observe strong effects of mergers on borrowers of acquiring banks, as well as heterogeneous effects between acquiring and target banks.

Sapienza (2002) and Karceski et al (2005) also find the effects of mergers on target bank borrowers to be stronger for small than for large target banks. Although all of our target banks are large relative to nonmerging banks, we nevertheless test whether the short-run effect on target bank borrowers is stronger when the size difference

³² An exception to the latter result is the multiple-relationship regression in the panel B sample where the coefficient is not significant.

between the acquiring and target banks is greater. We find evidence for this: a regression (unreported) including a term interacting the target bank dummy with a variable measuring the difference in size between the acquiring bank and target bank reveals that the interaction term is significantly positive. This suggests that the target bank effects become stronger when the size difference between the acquiring and target bank increases.

Finally, our results suggest that overlap borrowers have a significantly lower discontinuation rate than firms borrowing from a single merging bank, in line with Hypothesis d. Neither Sapienza (2002) nor Karceski et al (2005) treats overlap borrowers separately.

IV.3 Mergers and firm size

Are small borrowers affected differently than large borrowers by bank mergers? We address this combination of Hypotheses a,b and c in Table 7, which reports the results of the interactions of firm size with the merger variables separately for target and acquiring bank borrowers.³³

Table 7: Panel regressions: interaction with firm size for acquirer and target banks

The dependent variable in each regression equals one if during the following year firm *i* discontinues its relationship with bank *k*. The reported coefficients are logit estimates of a marginal change in the independent variable on the probability of losing the lending relationship. All regressions include a constant term, firm industry dummies, and year dummies (not reported). Definitions of the variables are provided in Section III. *, **, *** denotes significance at the 10, 5, and 1%-level, respectively (based on heteroskedastic-robust standard errors).

	With merging bank fixed effects		
	Sample		
	All	Single rel.	Multiple rels
ACQ _t	0.122***	0.043*	0.056*
TARG _t	-0.126***	-0.186**	-0.135***
ACQTARG _t	-0.428***	-	-0.365***
ACQ _{t-1}	0.127***	0.032	0.180***
TARG _{t-1}	0.102	-0.135***	0.162***
ACQTARG _{t-1}	-0.312***	-0.216	-0.376**
ACQ _t * ln(ASSETF)	-0.009***	-0.004**	-0.004**
TARG _t * ln(ASSETF)	0.011***	0.017***	0.008***
ACQTARG _t * ln(ASSETF)	0.021***	-	0.017***
ACQ _{t-1} * ln(ASSETF)	-0.010***	-0.004*	-0.013**
TARG _{t-1} * ln(ASSETF)	0.002*	0.017***	-0.007***

³³ We have also run similar regression interacting the merger variables with firm profitability; however, we obtained no significant results.

ACQTARG _{t-1} *ln(ASSETF)	0.020**	0.011	0.020
Firm controls	yes	yes	yes
Bank controls	yes	yes	yes
Bank dummies	yes	yes	yes

The differing relative effects of mergers on firms of differing sizes are reflected by the interaction of the merger variables with ln(ASSETF). Interestingly, the sign of the total merger effect, as given by the sum of the merger variable and the interaction term (e.g., ACQ + ACQ*ln(ASSETF)), differs in certain regressions for small and large firms.³⁴ The negative signs on the interaction terms ACQ_t*ln(ASSETF) across the different regressions indicate that large firms with single and multiple relationships are favored by acquiring banks in the short and the longer run: large firms borrowing from the acquiring bank have a lower discontinuation rate than small firms. With respect to target bank borrowers, the signs on the interaction terms show no consistent pattern and vary in the short and the longer run and across firms with single and multiple relationships.

The result that larger borrowers are more likely to maintain their relationships at acquiring banks is consistent with the hypothesis that mergers gives banks a greater comparative advantage in lending to large firms. However, as can be seen from the variation in signs of TARG_{t-1}*ln(ASSETF) across the regressions, the results for target bank borrowers are not completely consistent with this hypothesis. To further investigate this issue and to allow for potential nonlinearities in the impact of mergers on firm size, we run a regression where we include four firm size buckets, with each corresponding to a quartile of the firm asset size distribution. The relative effects of mergers on different size categories are reflected by the interaction of the merger dummy variables with the different firm size buckets; e.g., ACQ*ASSETFi, TARG*ASSETFi and ACQTARG*ASSETFi with $i = 2, 3$ or 4 and where the smallest bucket is the base case.

The results of this regression are reported in Table A7 in the Appendix. Of particular interest are the results related to target banks. The insignificant coefficient on TARG_t

³⁴ The coefficients on the noninteracted merger variables must now be interpreted as reflecting the effect of a merger for a firm with a zero value of assets. Despite the fact that some of the coefficients on these merger variables have changed signs relative to the regressions reported in Table 6, the

and the positive sign on $TARG_t * ASSETF_i$, $i = 2,3,4$, for the "All" and the Single rel. regressions indicate that in the short run, single relationship target borrowers in all asset categories except the smallest have a higher probability than similar nonmerging bank borrowers of having their relationship discontinued. For multiple relationship target borrowers, however, only those in the largest size category (ASSETF4) have a higher short-run probability of discontinuation than similar nonmerging bank borrowers. In the longer run, all target bank borrowers in every size class except the largest have a higher probability of discontinuation than do similar nonmerging bank borrowers. Single relationship target borrowers in the largest size category actually have a lower long-run probability of discontinuation than similar nonmerging borrowers.

We can also use the sign of the sum of $ASSETF_i + TARG_t * ASSETF_i$ for $i = 2,3,4$ to determine whether larger target borrowers have higher discontinuation rates than smaller target borrowers. Examination of these coefficients reveals that the probability of discontinuation for target borrowers generally exhibits a U-shape: intermediate-sized borrowers have a lower discontinuation rate than their smaller and larger counterparts. Very large target borrowers, however, have lower discontinuation rates than very small ones.

In summary, there appears to be no strong evidence that mergers have stronger effects on smaller firms than larger firms, once one controls for single versus multiple lending relationships. The effect of size on target borrower continuation rates generally exhibits a U-shape.

IV.4 Mergers and Relationship intensity

How do merger effects hinge upon the intensity of the borrower-merging-bank relationship? Relationship intensity may play a role in determining the magnitude of acquiring and target effects. The previous tables show that higher CONC lowers the discontinuation rate with a bank. To the extent that the "additional" impact of a merger is to increase the probability of discontinuation (which holds in our case for target borrowers), this impact might be expected to be stronger for those borrowers

estimated total marginal effects of mergers (as reflected by e.g., $ACQ + ACQ * \ln(ASSETF)$) are the

which would otherwise have been expected to have a low probability of being dropped; namely, borrowers with high loan concentrations. The reasoning is that borrowers with a higher CONC at the target bank may face more difficulties to hedge against changes in credit policies of the merged bank. To the extent that the "additional" impact of a merger is to decrease the probability of discontinuation (which holds in our case for acquiring and overlap borrowers), then this impact might be stronger for those borrowers who would otherwise have been expected to be dropped; namely for borrowers with low loan concentrations.

In order to test these conjectures, we construct four dummy variables, corresponding to four intervals of the CONC variable: 0-15%; 16-45%; 46-75%; 76-100% (labeled as CONC0-15, CONC16-45, CONC46-75, CONC76-100, respectively). These intervals capture roughly the quartiles of the distribution of CONC across multiple relationship firms. Table 8 displays the results of a regression that includes three CONC dummies (CONC0-15 is the base case) and the interactions of each of these dummies with our merger dummies.³⁵

This table shows that for acquiring borrowers, the drop rate is significantly less than the drop rate for nonmerging borrowers for only the lowest interval of CONC, as can be inferred from the ACQxCONC0-15 coefficient. For all other ranges of the CONC variable the drop rate of acquiring borrowers does not differ significantly from nonmerging borrowers with similar levels of CONC. Thus, the effect of the merger for acquiring borrowers is to lower the drop rate for the group of borrowers with the least intense relationships.

For target borrowers, the drop rate is significantly higher than for nonmerging borrowers for the two highest intervals of concentration CONC46-75 and CONC76-100. Thus, the effect of the merger on target borrowers is to raise the drop rate for the borrowers which would have been expected to be the most likely to continue on with the merged bank, all else equal.

same as those implied by the coefficients in Table 8.

Table 8: Panel regression: mergers and relationship intensity

The dependent variable in the regression equals one if during the following year firm *i* discontinues its relationship with bank *k*. The reported coefficients are logit estimates of a marginal change in the independent variable on the probability of losing the lending relationship. All regressions include a constant term, firm industry dummies, and year dummies (not reported). Definitions of the variables are provided in Section III. *, **, *** denotes significance at the 10, 5, and 1%-level, respectively (based on heteroskedastic-robust standard errors).

	With merging bank fixed effects
	Multiple rels
CONC16-45	-0.075***
CONC46-75	-0.138***
CONC76-100	-0.151***
ACQxCONC0-15	-0.031***
ACQxCONC16-45	-0.005
ACQxCONC46-75	0.001
ACQxCONC76-100	-0.002
TARGxCONC0-15	-0.009
TARGxCONC16-45	-0.007
TARGxCONC46-75	0.028***
TARGxCONC76-100	0.028***
ACQTARG	-0.103***
Firm controls	yes
Bank controls	yes
Bank dummies	yes

We also investigate for overlap borrowers whether the composition of bank funding between target and acquiring bank is important in explaining the discontinuation rate. To do this, we run a regression on overlap borrowers, with right-hand side variables including firm characteristics and the dummy variables TARGCONC16-45, TARGCONC46-75, and TARGCONC76-100, representing the overlap borrower's concentration with the target bank. The dependent variable equals 1 if the overlap borrower's relationship with the merged bank is discontinued. The results of this regression appear in Table 9. These results show that overlap borrowers with target bank concentrations of greater than 75 percent – and, by definition, acquiring bank concentrations of less than 25 percent – have a higher discontinuation rate than similar overlap borrowers with lower target-bank concentrations. In other words, overlap borrowers who have a significantly more intense relationship with the target bank are more likely to discontinue at the merged bank. Thus, it is not only whether a firm is borrowing from two of the merging banks that is important, but also the

³⁵ Since we included interactions of the merger dummies with all four intervals of the CONC dummies, we excluded the individual merger dummies. Thus, the interaction terms capture all of the effects of the mergers.

composition of this relationship. This finding reinforces the merger results for multiple relationship borrowers presented above.

Table 9: Relationship intensity with target bank for overlap borrowers

The regression includes only overlap borrowers. The dependent variable in the regression equals one if during the following year firm i 's relationship with the merged bank is discontinued. The reported coefficients are logit estimates of a marginal change in the independent variable on the probability of losing the lending relationship. All regressions include a constant term, firm industry dummies, and year dummies (not reported). The variable $TARGCONC_i$, $i=16-45, 46-75, 76-100$ represent the overlap borrower's concentration with the target bank. Definitions of all other variables are provided in Section III. *, **, *** denotes significance at the 10, 5, and 1%-level, respectively (based on heteroskedastic-robust standard errors).

	Overlap borrowers
Ln(AGEF)	-0.005
Ln(ASSETF)	0.003
ROAF	0.009
LEVERAGE	-0.010
LEVERAGE*NEGEQ	0.020
RECBALANCE	-0.028**
YOUNG	0.018
TARGxCONC16-45	0.013
TARGxCONC46-75	0.007
TARGxCONC76-100	0.024**

IV.5 Robustness

We have undertaken several robustness checks. First, our definition of a lending relationship is based on utilised exposures and includes firms with zero utilised exposures but which are nevertheless reported by the bank in the credit register. Because firms with zero utilised exposures might be expected to be more likely to “exit” the data set and have their relationship discontinued, and to make sure that these firms are not driving our results, we have run our panel regressions excluding these firms. The results remain very similar and are therefore not reported.

Second, we have also re-run the regressions by creating consolidated bank control variables for the entire 1997-2003 period (as in Focarelli et al (2002)).³⁶ While some of the bank control variables turn insignificant, the results for our merger variables of interest remain unaffected.

³⁶ I.e., we treat the pre-merging banks as if they have already been merged.

Third, our CONC variable might only partially capture relationship intensity. Another frequently used relationship indicator is the duration of a lending relationship. The limited time window of our sample however prevents us from entering the duration of a relationship as an explanatory variable, as we suffer a serious left and right censoring problem. We deal with this issue by, in addition to including CONC in the regression specification, excluding from our sample all firms that switch or add a bank relationship.³⁷ The reasoning is that, within the remaining sample, there is no more left censoring of the duration of the relationship. Our results remain robust to the exclusion of firms switching or adding relationships.

Fourth, banks and firms decide on their relationship intensity, implying that CONC may be endogenous, and as such might influence the coefficients of the other variables. However, our results indicate that this is not an important issue as (1) excluding the CONC variable does not affect the coefficients of the other variables, and (2) running regressions separately for firms in each concentration bucket leaves the coefficients of the other variables unaffected.

Fifth, in order to further test our results relating to overlap borrowers, and to ensure that this result is not reflecting merely the differences in characteristics of these and other borrowers, we have rerun the merger regressions including in the sample only firms of similar size to that of overlap borrowers. Our merger results continue to hold in these regressions.

Finally, mergers may be endogenous, in the sense that the acquiring bank chooses a target bank with particular characteristics, e.g., having a loan portfolio with a particular sectoral composition, relative to that of the acquiring bank. This would imply that discontinued relationships of the consolidated bank would follow some sectoral pattern. We have compared the sectoral compositions of the loan portfolios of the acquiring bank, target bank, and consolidated bank for each merger and have found no sectoral patterns. Discontinuations of relationships are not consistently higher in certain sectors than others.

³⁷ This resulted in excluding 5.8 percent of firms from the All regression, 5.4 percent from the single

IV.6 Discussion

Our results show that target-bank borrowers are more likely to have their relationships discontinued due to mergers, both in the short and longer run. The severity of the welfare losses these borrowers incur, however, will be much stronger when they are unable to raise bank finance, compared to a situation where they can the switch to other banks. We investigate this issue by examining the switching rates of single relationship borrowers. We find that the switching rates of target borrowers are identical to those of nonmerging borrowers (1.2%), while the switching rate of acquiring bank borrowers is slightly lower (0.8%). The overall picture, therefore, is one where target bank borrowers incur considerable welfare losses, as about 92% of all discontinued target bank relationships “exit” the credit register for at least a couple of years.³⁸ Although borrowers who switch relationships likely also incur welfare losses, these losses may be expected to be substantially lower than those who “exit” the sample. The aggregate welfare losses are presumably considerable, as about 82% of all firms in our sample has a single relationship and is, therefore, unable to hedge against changes in credit policies following a merger.

V. Loan Volumes

Is the availability of credit affected by bank mergers? We address this issue by analyzing changes in firms’ loan volumes as a percentage of total assets. Our sample consists of the continuing firms used in our previous panel regressions, but now excluding firms which switch banks, add or drop a relationship. These types of events would likely confound our results on the effects of mergers on loan volumes of firms that “continue at the same bank”.

We first consider single-relationship borrowers. The dependent variable in our regression is the change in a firm’s loan volume between t and $t+j$ (with $j=1,2$) as a

relationship regression, and 6.4 percent from the multiple relationship regression.

³⁸ About 10% of all single-relationship nonmerging bank borrowers that discontinue switch relationships. This number is only 8% for all discontinued single-relationship borrowers at target banks (following from the similar switching rate for target and nonmerging bank borrowers but higher discontinuation rate of target borrowers), implying that 92% of all discontinued target bank borrowers are left without bank credit.

proportion of the firm's assets at t-1. Explanatory variables include dummies indicating whether or not firms were borrowing at t from an acquiring or target bank involved in a merger between t and t+1, as well as firm and bank characteristics. The regression specification is:

$$\frac{\text{loan volume}_{t+j} - \text{loan volume}_t}{\text{ASSETF}_{t-1}} = \alpha_0 + \alpha_1 \text{ACQ}_t + \alpha_2 \text{TARG}_t + \beta(\text{firmcontrols})_{t-1} + \gamma(\text{bankcontrols})_{t-1} + \varepsilon_{t+j}$$

The regressions for $j = 1$ aim at identifying the “short run” effects of mergers, whereas $j = 2$ deals with “longer-run” effects. The sample of firms used to address the short run and long run effects is identical to enhance the comparability of results.³⁹ Table 10 reports the results of these regressions.

Table 10: Mergers and credit availability: single relationship firms continuing at the same bank

The dependent variable is the % change in loan volume in between t and t+j over firm assets at t-1. All regressions include a constant term, firm fixed effects, and year dummies (not reported). Definitions of the variables are provided in Section III. *, **, *** denotes significance at the 10, 5, and 1%-level, respectively (based on heteroskedastic-robust standard errors).

	Short run (j=1)	Longer-run (j=2)
Firm controls		
ln(AGEF)	-0.55	-0.92
ln(ASSETF)	-10.23***	-12.16***
ROAF	3.75***	4.56***
LEVERAGE	-8.98***	-10.28***
LEVERAGE*NEGEQ	0.61	0.47
RECBALANCE	1.12***	0.39*
YOUNG	-0.48	0.37
Merger variables		
ACQ _t	-0.48	0.15
TARG _t	-1.06***	-1.10***
Bank controls		
ln(ASSETB)	-0.71***	-0.72***
ROAB	72.45***	236.25***
BADLOANSB	-31.72	-2.10
OPCOSTB	14.83***	0.95
LIQB	-2.73**	-3.09***
Merging Bank dummies	Yes	Yes
Observations	204589	204589
Adjusted R ²	0.22	0.24

³⁹ The sample consists of all firms that continued borrowing for at least 2 years at the same bank. The implication is that we exclude observations from the last year of our sample. Inclusion of these firms to address short-run effects leaves our main results unaffected (but with a lower adjusted R²).

These results are broadly in line with the findings reported in the previous section. Firms borrowing from target banks have a 1.1% lower change in loan volumes (as a percentage of assets) than otherwise similar firms borrowing from non-merging banks. These results suggest that single-relationship target borrowers continuing the relationship with the consolidated bank are harmed, as their changes in loan volumes are lower than for similar borrowers at nonmerging banks. This effect appears in the short run and seems to persist in the longer run. Interestingly, the coefficient on ACQ is not statistically significant, suggesting that borrowers of acquiring banks who stay on with the consolidated bank do not face higher interest rates.⁴⁰

A criticism that might be raised is that target banks may have engaged in excessive lending to borrowers prior to the merger, and, therefore, our results on loan volumes simply indicate a return by the consolidated bank towards a more neutral credit policy. However, the firm variables in our regression specification control for this effect. Insofar as target bank borrowers have overborrowed in the past, this should be captured by the firm's leverage prior to the merger. Indeed, leverage enters the regression with a negative sign, indicating that firms with high leverage have more negative changes in their loan volumes. Firm variables included in the regressions in Table 9 also control for demand factors. The results indicate that smaller and more profitable firms tend to have larger changes in loan volumes. The bank control variables may capture supply factors. They suggest that firms borrowing from smaller, more profitable, and less liquid banks have higher increases in loan volumes.

We have also run similar regressions for multiple relationship firms. In contrast to the single relationship regressions, the coefficients on ACQ and TARG are not statistically significant, although the coefficients have similar signs. This suggests that multiple relationship firms continuing on with target banks following a merger may have the ability to compensate for less favorable loan terms by relying more heavily on their nonmerging bank lenders. In other words, multiple relationship firms are able

⁴⁰ These results contrast with Bonaccorsi di Patti and Gobbi (2003), who do find no adverse effects of bank mergers on loan volumes of Italian corporate borrowers.

to hedge against changes in credit policies by borrowing from the already established relationships with other banks.

Loan volume increases versus decreases might imply different decisions by banks. For example, loan decreases may merely represent a contractual repayment of loans. In a robustness exercise, we have run a logit regression where the dependent variable equals one if loan volumes increase and zero otherwise (i.e. when there is a decline in the utilized loan volume). The results again indicate that single relationship target borrowers continuing at the merged bank are less likely to enjoy a loan increase.

VI. Conclusion

This paper studies the impact of bank consolidation on bank lending relationships of small and medium-size firms, using information from individual loan contracts in Belgium. We estimate the effect of bank mergers on borrowers' ability to maintain their bank relationships and to continue to tap bank credit. The paper represents one of a very small number of papers relying on firm-level loan contract data to study the effects of bank mergers. In addition, it considers mergers in an environment where firms maintain relatively few relationships and banking markets are highly concentrated: features that have not been present in other studies but which are typical for a number of countries.

When we distinguish between borrowers of acquiring and target banks, we find that borrowers at target banks are more likely to see their relationship terminated, whereas borrowers of acquiring banks are less likely to have their relationship dropped following a merger. These differential effects begin appearing even in the short run, but they become more robust in the longer run. In addition, our results on acquiring bank borrowers appear to be stronger than those reported in empirical work for other countries.

We also find that the intensity of the relationship reduces the probability of relationship termination. The greater the concentration of a multiple relationship borrower's loans with a given bank, the lower the probability that the relationship will be terminated. In addition, borrowers of an acquiring bank with low levels of

concentration are less likely than similar nonmerging borrowers to lose their relationship. Borrowers of target banks with high levels of concentration are more likely than their nonmerging borrower counterparts to lose their relationship.

Similar to other studies, we find heterogeneous effects of bank mergers for large versus small firms. The effects, however, also differ for large firms borrowing from acquiring banks compared with large firms borrowing from target banks, and for target bank borrowers with single versus multiple lending relationships. Whereas large borrowers of acquiring banks are favored by the merged bank, smaller borrowers of target banks do not appear to be systematically more harmed by mergers than larger target borrowers, once we control for single versus multiple lending relationships. Although target borrowers of all sizes, with the exception of the smallest borrowers, face higher discontinuation rates than similar nonmerging-bank borrowers, the relationship between size and discontinuation rate for target borrowers generally exhibits a U-shape.

Because switching costs are likely to be higher for borrowers with single relationships than for borrowers with multiple relationships, we run separate regressions for firms with single and with multiple relationships, as well as for all firms taken together. Although results for these two groups are similar, a few differences appear, such as those for target borrowers noted above. Another difference emerges in the effect of firm age on the probability of dropping a lending relationship. Younger firms with single relationships have more stable lending relationships than older firms, whereas younger firms with multiple relationships have less stable lending relationships than older firms.

Firms borrowing from two of the merging banks are substantially less likely to lose their relationship with the consolidated bank than other borrowers. One might ask whether this result simply reflects the relationship with the acquiring bank, which also would imply that the firm has a lower probability of losing the relationship. The effect for these overlap borrowers, however, is much stronger than that for acquiring bank borrowers only. This suggests that informational gains arise from the pooling of information of the merging banks that may not appear when only one of the merging banks was previously lending to the firm.

Finally, we find that single-relationship firms borrowing from the target bank and who continue on with the consolidated bank are harmed by the merger: changes in their loan volumes are lower than for otherwise similar borrowers. Changes in loan volumes of multiple-relationship target-bank borrowers who continue on with the consolidated bank are not significantly different from those of otherwise similar borrowers.

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Appendix A
Variable definitions

<i>Firm control variables</i>	
AGEF	Age of the firm in years
ASSETF	Total book value of assets of the firm, expressed in 2002 €
ROAF	EBIT over assets
LEVERAGE	Book value of debt over assets
NEGEQ	Dummy that takes value 1 if firm has negative equity
RECBALANCE	Dummy that takes value 1 for firms with balance sheet available in at least one of the two years prior to year in which credit was granted
YOUNG	Dummy that takes value 1 for firms younger than 3 years and whose balance sheet covers less than 12 months of data
<i>Bank control variables</i>	
ASSETB	Total assets of the bank, expressed in 2002€
ROAB	Total return on assets
BADLOANSB	Non-performing loans over total loans
OPCOSTB	Operating costs over total assets
LIQB	(Cash + net position in the interbank market + short term securities' portfolio + government bonds) over assets
<i>Merger variables</i>	
MERG1 _{kt}	Dummy =1 if firm borrowing from bank <i>k</i> which was involved in a merger occurring during 12 months following time <i>t</i> and if firm not borrowing from any of the other merging banks
MERG2 _{kt}	Dummy =1 if firm borrowing from bank <i>k</i> which was involved in a merger occurring during 12 months following time <i>t</i> and if firm borrowing from at least one of the other merging banks
ACQ _{kt}	Dummy =1 if firm borrowing from bank <i>k</i> which was the acquiring bank in a merger occurring during 12 months following time <i>t</i> and if firm not borrowing from any of the other merging banks
TARG _{kt}	Dummy =1 if firm borrowing from bank <i>k</i> which was a target bank in a merger occurring during 12 months following time <i>t</i> and if firm not borrowing from any of the other merging banks
ACQTARG _{kt}	Dummy =1 if firm borrowing from bank <i>k</i> which was involved in a merger occurring during 12 months following time <i>t</i> and if firm was borrowing from the acquiring and a target bank
MERG1 _{k,t-1}	Dummy =1 if firm borrowing from bank <i>k</i> which was involved in a merger occurring between time <i>t-1</i> and <i>t</i> and if firm not borrowing from any of the other merging banks
MERG2 _{k,t-1}	Dummy =1 if firm borrowing from bank <i>k</i> which involved in a merger occurring between time <i>t-1</i> and <i>t</i> and if firm was borrowing from at least one of the other merging banks
ACQ _{k,t-1}	Dummy =1 if firm borrowing from bank <i>k</i> which was the acquiring bank in a merger occurring between time <i>t-1</i> and <i>t</i>

	and if firm not borrowing from any of the other merging banks
$TARG_{k,t-1}$	Dummy =1 if firm borrowing from bank k and bank k was a target bank in a merger occurring between time $t-1$ and t and if firm was not borrowing from any of the other merging banks
$ACQTARG_{t-1}$	Dummy =1 if firm borrowing from bank k which was involved in a merger occurring between time $t-1$ and t and if firm was borrowing from both the acquirer and a target bank
<i>Other variables</i>	
UR	Dummy that takes value 1 if firm has a single lending relationship
CONC	Proportion of multiple-relationship firm i 's utilised loans accounted for by bank k

Table A7: Panel regressions: interaction with firm size buckets for acquirer and target banks

The dependent variable in each regression equals one if during the following year firm i discontinues its relationship with bank k . The reported coefficients are logit estimates of a marginal change in the independent variable on the probability of losing the lending relationship. All regressions include a constant term, firm industry dummies, and year dummies (not reported). Definitions of the variables are provided in Section III. *, **, *** denotes significance at the 10, 5, and 1%-level, respectively (based on heteroskedastic-robust standard errors). ASSETF2, ASSETF3 and ASSETF4 are dummy variables equal to one (zero otherwise) when a firm is in the second, third, and fourth asset quartile respectively.

	With merging bank fixed effects		
	Sample		
	All	Single rel.	Multiple rels
ASSETF2	-0.054***	-0.065***	-0.035***
ASSETF3	-0.069***	-0.084***	-0.055***
ASSETF4	-0.071***	-0.059***	-0.067***
ACQ _{<i>t</i>}	-0.001*	-0.004	-0.007
ACQ _{<i>t</i>} *ASSETF2	-0.010**	0.000	-0.016*
ACQ _{<i>t</i>} *ASSETF3	-0.014***	0.000	-0.014
ACQ _{<i>t</i>} *ASSETF4	-0.022***	-0.009	-0.019**
TARG _{<i>t</i>}	-0.004	0.005	-0.011
TARG _{<i>t</i>} *ASSETF2	0.019***	0.033***	-0.012
TARG _{<i>t</i>} *ASSETF3	0.036***	0.050***	0.017
TARG _{<i>t</i>} *ASSETF4	0.048***	0.043***	0.040***
ACQTARG _{<i>t</i>}	-0.214***		-0.211***
ACQTARG _{<i>t</i>} *ASSETF2	0.022		0.000
ACQTARG _{<i>t</i>} *ASSETF3	0.057		0.043
ACQTARG _{<i>t</i>} *ASSETF4	0.081*		0.075
ACQ _{<i>t-1</i>}	-0.012***	-0.021***	0.006
ACQ _{<i>t-1</i>} *ASSETF2	-0.003	0.006	-0.020*
ACQ _{<i>t-1</i>} *ASSETF3	-0.014***	-0.001	-0.031***
ACQ _{<i>t-1</i>} *ASSETF4	-0.026***	-0.016*	-0.041***
TARG _{<i>t-1</i>}	0.057***	0.060***	0.030**
TARG _{<i>t-1</i>} *ASSETF2	0.045***	0.047***	0.063***
TARG _{<i>t-1</i>} *ASSETF3	0.040***	0.051***	0.046***
TARG _{<i>t-1</i>} *ASSETF4	-0.014**	-0.027**	0.010
ACQTARG _{<i>t-1</i>}	-0.087**	-0.077*	-0.150
ACQTARG _{<i>t-1</i>} *ASSETF2	-0.018		0.066
ACQTARG _{<i>t-1</i>} *ASSETF3	0.026		-0.005
ACQTARG _{<i>t-1</i>} *ASSETF4	0.017		0.069
Firm controls	yes	yes	yes
Bank controls	yes	yes	yes
Bank dummies	yes	yes	yes