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Nowhere Else to Go: The Determinants of Bank-Firm Relationship Discontinuations after Bank Mergers

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Abstract

The decision to change or terminate a bank-firm relationship has been demonstrated to be crucial for firm performance following bank mergers. We find both competition and the available firm collateral to be important factors in enabling firms to switching banks, instead of dropping their bank relationships. We also provide novel evidence that firms who are able to *add* a bank relationship following a merger exhibit much stronger post-merger performance. Our findings are consistent with the interpretation that bank-mergers cause a reduction in lending to most firms, leading them to search for alternative sources of finance.
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1 Introduction

Bank mergers constitute a significant event in the bank-firm relationship. As such, many studies have demonstrated that a bank merger can have negative effects on firms' access to credit (Berger et al., 1998) and as result on their real outcomes in terms of investment, returns and productivity (Degryse et al., 2011; Di Patti and Gobbi, 2007; Fraisse et al., 2018). These effects are especially relevant where consolidation is significantly increasing and where non-financial firms are particularly dependent on bank lending. Given the recent consolidation trends in most European banking sectors, the expectations on new merger waves and the reliability of many small and medium enterprises on bank financing, Europe appears to be an appropriate testing ground.[1]

Significantly, Degryse et al. (2011) show that negative firm-level effects of bank mergers mostly occur when the bank-firm relationship is dropped in the aftermath of a merger. However, they also show that this is not due to the fact that banks cut 'bad' firms after the merger. As a result, the question of why bank-firm relationships are terminated after a bank-merger remains open. We shed light on this question by demonstrating that firms are looking to replace lending reductions resulting from the merger, by attempting to replace or complement their current bank relationships. We present novel evidence that especially the latter firms benefit from the bank merger: Firms *adding* another bank relationship perform significantly better than their counterparts following a bank merger. We then demonstrate that this ability to find funding at other banks crucially depends on two factors: bank competition and firm collateral. Firms affected by a target bank merger are less likely to

[1]The Report on Bank Structures of the ECB shows that the number of credit institutions in the Eurozone declined from 8570 in 2008 to 6648 in 2016. Bank managers also seem to be very aware of this consolidation trend. A top official of a large European bank illustrated these concerns as follows: 'Europe needs more pan-European banks. JPMorgan is the biggest bank in the US with a market capitalization of almost 380 billion dollars, but the biggest European bank is Santander, with a market cap of 80 billion Euros (...) and banks are the only viable way to finance the continent's large population of small- and mid-sized businesses' (Financial Times: https://www.ft.com/content/a4ca22b8-6188-11e8-90c2-9563a0613e56).

drop their bank relationship and more likely to switch to another bank if they are located in a less concentrated banking market. Similarly, firms with more available collateral are less likely to drop their bank relationship and more likely to switch to another bank. These results strongly suggest that increasing bank-market concentration comes at the expense of firms who have little collateral and are already in a non-competitive environments, as such firms will struggle to find alternatives to their existing bank following a merger.

In order to arrive at our findings we use a bank-firm level dataset from Germany, which comprises almost 500,000 firms and their banks.[2] We merge this data with information on 526 German bank-mergers from 2005 to 2014. We then first estimate the effects of a bank-merger on firms' real outcomes using a difference-in-difference type approach. Additionally, we derive dummies on bank-firm relationship (dis-)continuations from the dataset and then estimate logit regressions to derive the impact of the competitive environment and the firms' collateral on the probability to stay, switch, drop or add a bank relationship following a merger.

A large literature is concerned with the consequences of bank mergers, especially for lending to firms. DeYoung et al. (2009) summarizes the findings from various merger studies on lending and find mixed evidence for the net effect of banking market consolidation for price and availability of firm credit. While there are some studies that find an overall negative effect of credit availability for firms (Carow et al., 2006; Di Patti and Gobbi, 2007; Craig and Hardee, 2007), other studies find mixed results (Sapienza, 2002; Berger et al., 2007; Francis et al., 2008) and Marsch et al. (2007) finds no negative lending effects after bank mergers for Germany. The evidence for prices is also mixed, with mergers generally emerging to cause small decreases in prices except if the merger causes a significant shift in market share (Erel, 2011).

[2]Similar data has been used in Popov and Rocholl (2017); Koetter et al. (2016) among others.

More recently, this literature has not only considered the effects on lending but also on firm outcomes. A robust theme is that mergers are more likely to disrupt the firm-bank relationship and as a result may be harmful to firms (Mercieca et al., 2009; Di Patti and Gobbi, 2007; Degryse et al., 2011). For example, Montoriol-Garriga (2008) provides evidence on the costs and benefits of bank mergers to small businesses using a sample of Spanish firms. The results show that mergers are harmful to small businesses because lending relationships are more likely to be disrupted following a merger. This study also identifies that small borrowers of target banks have a higher probability of having terminated a relationship with the consolidated bank and they will also find it harder to start new lending relationship with consolidated banks. Overall, her results suggest higher termination rate for existing borrowers is not compensated with a higher initiation rate of new lending relationships with small business after the merger. However continuing borrowers are shown to benefit from mergers in terms of reduced loan rates.

Importantly, real effects do not only emerge when a consolidation wave takes place. A single megamerger may also have a significant macroeconomic impact. Fraisse et al. (2018) study the effect of a merger between two large banks on credit market competition. They find that the megamerger has a negative effect on lending, in particular through termination of relationships. They find that, in the average market, bank credit decreases by 2.7 per cent. On the real side, firm exit increases by 4 per cent, whereas firms that do not exit and firms that start up experience no adverse real effect on investment and employment.

Using Belgian data, Degryse et al. (2011) demonstrate that adverse effects of bank mergers mainly materialize after firm-bank relationship 'drops', whereas firms who either stay with their bank, or manage to switch to another bank do not show many negative effects in terms of credit and investment. Importantly, they demonstrate that these drops can not be explained by the fact that the merged bank is better at screening borrowers and thus

efficiently drops borrowers from their portfolio, but rather that firms who should have been dropped, but were not, performed worse than the firms that were actually dropped.

Overall the literature indicates that the understanding of *why* firm-bank relationships are terminated following bank-mergers remains an unanswered question, on which we intend to shed light with our findings. In line with the literature, we propose in this paper that firms are subject to a general reduction in lending from a merged bank. Firms then search for alternative means of financing. Successful firms who are either able to switch to a different bank or add an additional bank, perform significantly better following the merger. We then demonstrate that this ability to switch or add a bank relationship crucially depends on both the firms available collateral and the bank-competition in the firms region, demonstrating the importance of bank-alternatives for firms after one of their banks has merged.

2 Data

For our analysis we use a matched bank-firm level dataset for Germany, which attaches bank-level balance sheet data from Bankscope to firm level data from Dafne and Amadeus. All three databases are provided by Bureau van Dijk and contain balance sheet data of banks and firms, respectively. Matching of firm data to bank data occurs via (historical vintages) of the Dafne database. The same or similar datasets have recently been used in several studies (Popov and Rocholl, 2017; Koetter et al., 2016; Rehbein, 2018).[3] While this dataset does not provide loan-level data, it identifies roughly 1.1 million firms (and 2000 banks) for Germany and the corresponding bank-firm relationships, which includes detailed information on small and medium sized enterprises and their banks, which are

[3]The firm-bank level matched database relies on a string match between the bank name in the firm level data and the bank name in the bank level data. As a result, the match is not perfect although manual corrections lead to a 99% match of bank-firm relationships.

usually not included in loan-level databases.[4] We merge this firm-bank level data to 526 bank mergers for German banks between 2005 and 2014, using official data provided to us by the German Bundesbank.

From this merged dataset we drop all financial firms, firms for which we do not observe any valid postcode, all inactive firms, all firms for which we do not observe total assets and all firms for which we have only one available year. We also apply some logic tests, and drop firms which fail them. For example, if firm equity exceeds firm assets. We also drop all firms whose banks were target of a merger more than once during our observation period, in order to remove potential concerns for overlapping merger effects and to make the effects of mergers comparable across firms. We also drop all observations for which do not have data on our control variables. However, because the data coverage varies significantly over the firm-level variables, we choose not to restrict the sample along the lines of the dependent variables, thus keeping the sample for each regression as large as possible.[5] The final sample consists of 463,740 firms and 2,116 banks.

TABLE 1 AROUND HERE

Descriptive statistics for the firms used in the analysis are displayed in Table 1. About 8% of our observations occur after a firms' bank has been subject to a merger, whereas some 36% of observations occur after the bank has been the buying party in a merger. Our discontinuation variables demonstrate that a change in bank relationships is relatively rare; only in 6% of cases is a switch or drop of a bank relationship is observed, whereas adds occur in about 10% of cases. The mean HHI - our measure of banking market concentration - is .56, although there is considerable variation in the data. The firm-level

[4] As for example in DEALSCAN data for the US.

[5] There is strong indication that this lack of reporting of variables is non-random. Smaller firms generally have more missing variables. As a result this choice is also made to restrict selection bias in the sample.

outcome and control variables demonstrate clearly that the firms in the sample are very small; the average amount of total bank loans amount to just 540,000 Euros at roughly 3% interest. Firms have 60 employees on average (median of 12), and are highly profitable on average with a return on equity of 34% (median 19%).

3 Effects of bank mergers on firm outcomes

3.1 Overall effect on firm outcomes

First, we aim to compare firms whose banks have been subject to a bank merger to firms that did not. Because firms can have more than one bank relationship, we identify all firms, which had any of their banks merging during our sample period, and compare them to firms, which have not experienced a bank merger during during the sample period. To this end, we create a dummy variable which is 0 before the merger and 1 after a merger has taken place. In order to capture all post-merger effects this dummy remains at 1 for the rest of the periods in the sample. Di Patti and Gobbi (2007) and Degryse et al. (2011) estimate similar firm-level regressions of bank mergers, although their dummy is set to one for only a few periods after the merger.

As a result we formally estimate the following initial regression:

$$\ln Y_{jt} = \alpha_j + \alpha_r \times \alpha_t \ + \beta_1 merger_{jt} + \beta_2(firmcontrols) + \epsilon_{jt} \tag{1}$$

where Y_{jt} are the variables of interest for which we expect the bank merger to have signif-

icant effect: ln(loans), interest rate, ln(trade credit), collateral (ln(tangible fixed assets)), ln(employees) and return on equity. We choose loans and the interest rate (proxied by total interest expense/loans) by firms in order to investigate whether the price and the volume of credit changes on the firm level after a merger. We then use trade credit to see if firms substitute a change in bank lending by adjusting their level of trade credit. We then investigate whether the merger additionally had any effect on firms' input factors: capital (tangible assets) and labor (employees) and finally whether it affected their return.

In addition to firm fixed effects we also control for region×time fixed effects in order to ensure that regional (demand) trends are not driving the frequencies of bank mergers. We include a number of lagged firm control variables: Cash, total assets, current liabilities (all in logs) and the firms' capital ratio. All firm control variables are lagged by one period.

TABLE 2 AROUND HERE

Our results demonstrate that target bank mergers have a significant effect on firms real effects. However, as opposed to Degryse et al. (2011) and Di Patti and Gobbi (2007), our results point to a larger overall economic impact. Column (1) and (2) of Table 2 indicate that firms, whose banks were target of a merger experienced a decrease in lending by roughly 13% and an increase in the interest rate by 7 basis points. The is some evidence that firms substitute this decrease in funding by increasing trade credit financing, although the effect is not statistically significant (Column (3)). Interestingly, the decrease in bank funding does not lead to a decrease in capital inputs, as tangible fixed assets remain unchanged (Column(4)). However, labor inputs are negatively affected, as firms reduce employment by about 1.4% (Column (5)). Firms' returns appear to not be affected by the merger. For buying mergers, we find only positive effects on employment, however the effect is economically small with an increase in employment by 0.9%.

Overall these results are in line with the previous literature, although we show larger negative effects of bank mergers on credit and performance, independent of whether the firm-bank relationship is continued or discontinued as in Di Patti and Gobbi (2007) and also independent of whether the firm is dropped or not dropped as in Degryse et al. (2011). We are the first to document that firms substitute not only with lending from other banks (Berger et al., 1998), but in fact also substitute trade credit for the shortfall of bank lending. We are also first to document the effect on firms input factors.[6] We curiously find that firms do not decrease assets, but rather decrease *employment*, despite the fact that lending is generally thought to affect capital inputs before employment. However, if firms believe the restricted access to credit is short-term only (which is supported by the findings in Di Patti and Gobbi (2007)), it might be easier to reduce the more flexible labor input.

3.2 Real effects by post-merger relationship status

Next, we test whether the findings by Degryse et al. (2011) that firms are most negatively affected by a bank merger if they drop their bank relationship in the aftermath of the merger hold for our sample. We do this by interacting our merger dummy with a categorical variable indicating the firm-bank relationship status after the merger. This categorical variable takes the value of 0 if the firm stays with the bank, 1 if the firm switches to another bank, 2 if it drops a bank relationship and 3 if the firm adds another bank to their portfolio. The variable is grouped over the the merger dummy, such that a change in any period after/before the merger is set to this value, independent of when it occurs. For example, if a firm-bank relationship drops after the merger, this variable will take value 0

[6]Di Patti and Gobbi (2007) Only investigate credit and Degryse et al. (2011) investigate only asset (growth), bankruptcy and profitability.

before the merger and 2 after the merger. It thus captures the post-/pre- merger bank-firm relationship changes (or continuations in the case of stays). Interacting this variable with our merger dummy thus indicates whether a merging firm that dropped their bank relationship will perform better or worse than a firm who experienced a bank merger but stayed with their bank.

TABLE 3 AROUND HERE

Table 3 indicates that additional negative effects of target bank mergers arise if the bank-firm relationship is dropped after a bank was a target of a merger and such negative effects are mitigated if id the firm adds another bank to its portfolio. Column (1) shows that in addition to the negative baseline effect on lending of about 16 %, firms who drop their relationship at some point after the merger experience a decrease in bank loans by an additional 32%, while firms who are able to add another bank increase their bank loans by roughly 40%. Dropping firms also reduce employment significantly more than firms staying with their bank; the negative baseline effect of 1.1% decreases by a further 5.8% for dropping firms. Adding a bank relationship also compensates the negative employment effect, as such firms increase employment by 3.2% over the baseline. Interestingly, dropping firms do not perform worse, instead increasing their return on equity by more than 7%. This is in line with findings by (Degryse et al., 2011) that target droppers firms' profitability increases. Importantly, we show that firms who are able add an additional bank to their portfolio perform much better along most outcomes. In addition to more bank loans, they also receive 38% more trade credit (Column(3)), increase their tangible assets by roughly 10% (Column (4)) although their profitability remains unchanged.

For banks being the buying party in a merger, all firms exhibit a small decrease in bank loans by 6%. Adding an additional bank is highly effective in mitigating this negative

effect, as it increases bank loans by roughly 35% (Column (1)). Firms who drop or add a bank after the merger more trade credit after the merger, which suggests that switching, dropping and adding firms' loan demand is exceeding what is supplied to them by their banks (Column (3)). Again, input factors increase most for firms, which add a bank and least for firms who drop their bank relationship after the merger (Columns (4+5)).

The regressions suggest two main interpretations. First, target bank mergers affect firms more significantly than buyer mergers. Second, firms which drop their bank relationship after the merger perform significantly worse than firms who stay with or switch their bank. Both findings are similar to those in Degryse et al. (2011). Our regressions additionally demonstrate a novel effect; adding an additional bank relationship after the merger has very strong positive effects for firms, both in terms of lending and input factors. This is a strong indication that firms may be systematically supplied fewer loans than they actually demand after a bank merger. Firms adding another bank are able to compensate by borrowing from an additional bank.[7] If it is in fact true that banks underserve their firm clients after a bank merger, there is much reason to suspect that bank-firm relationship termination is perhaps not driven by the banks decision to cut risky and not profitable firms,[8] but by the firms decision to change lenders, because they demand more loans than they are able to get from their post-merger bank.

[7]Note that these findings are line with Di Patti and Gobbi (2007) that firms with fewer lenders also experience a higher reduction in credit, presumably because they lack alternatives of obtaining additional credit.

[8]Degryse et al. (2011) show very nicely that dropped firms are actually *better* than non-dropped firms. This would be in line with the idea that profitable firms are looking for a new lender, because they are not served sufficient loans.

4 Decision to change relationships

Figure 1 illustrates descriptively that bank-firm relationships change more frequently after bank mergers.[9] We display the relative frequency of stays, switches, drops and adds on the y-axis, differentiated by firms which are affected by a bank-merger (after the merger) and those firms that are not. The figure suggests that after a merger, firm-bank relationships are almost twice as likely to be dropped and the chance to add another bank also increases. There is thus strong indication that in addition to firm outcomes suffering in case of a dropped relationship after a merger, this drop is also more likely. The goal of this section is to test whether this finding holds up to statistical tests, and why we find more drops after a merger.

FIGURE 1 AROUND HERE

4.1 Do firm-bank relationships change more frequently after mergers?

We estimate the decision to terminate the bank-firm relationship and whether this is influenced by the merger using separate logit regressions for each decision: Staying and not staying, switching and not switching, dropping and not dropping and adding and not adding. We chose separate logit models, because the decisions are quite distinct, and it is not clear that we are interested in the decision of dropping vs. staying more than the decision of dropping vs. switching. In fact, we demonstrate that a key factor in explaining post-merger relationship continuation decisions is mainly relevant in the switching vs. dropping comparison, namely competition. Again, because we estimate at the firm level,

[9] Because we omitted firms with multiple changes these relative frequencies sum up to 1.

the decision refers to *any* firm-bank relationship. This way of identification allows us to investigate the decision to *add* a bank. We thus specify the following logit model:

$$\ln\left[\frac{p(RelStatus_{it}=1)}{1-p(RelStatus_{it}=1)}\right] = \\ \alpha_t + \beta_0 + \beta_1 merger + \beta_2(firmcontrols) + \epsilon_{jt} \tag{2}$$

where $RelStatus_{it}$ refers to a staying, switching, dropping and adding dummy, which takes the value one if before/after the merger a firm-bank relationship stayed, switched, dropped or was added and 0 otherwise. As in Equation 1, β_1 is our coefficient of interest and $merger$ can be a dummy for any of the firms' banks being subject to either the target or the buyer in a bank merger. We include the same controls as in Equation 1.[10]

TABLE 4 AROUND HERE

Table 4 displays the results of the regression of the merger dummy on the decision to stay, switch, drop or add a bank relationship for the firm. Marginal effects are displayed in the table. The results indicate that the probability to switch decreases by about 0.9 percentage points due to a target merger, which is a sizable effect given that the base probability of non-merger firms is roughly 4% (Figure 1). Firms are also significantly more likely to drop their bank relationship by 3% percentage points. The effect of being the buying party in a merger is somewhat different. Firms are slightly more likely to stay with their bank by 0.1 percentage points. They are however more likely to switch, drop and add a relationship after the merger. This indicates that after target mergers, firms either stay with their bank

[10]Note that high level fixed effects are impossible in logit models, because the models are less likely to converge and because the computational effort cannot be handled by the resources available to us.

or have to drop the relationship completely, whereas buying mergers can more easily be compensated by switching or adding another bank.

4.2 Why do firm-bank relationships change after mergers?

Next we investigate the contributing factors to the decision to stay, switch, drop or add a bank, by interacting the merger dummy with two key aspects that play a role in the decision to stay, switch drop or add a bank relationship: competition and firm collateral. We measure competition by the bank-level Herfindahl Hirschmann Index (HHI) in the *firms* county and collateral by the log of firms tangible fixed assets. Again, we differentiate between firms whose banks were the target or the buying party in the merger. We then interact the merger variable with our continuous competition and collateral indicators.

The marginal effect of the target merger on the decision to stay, switch drop or stay at different levels of bank-competition is given in Figure 2, with the corresponding Table in the online appendix (without marginal effects, Table OA1). The figure shows, that there is an increase in the probability to keep the bank-firm relationship after a merger, but that effect does not vary much with the level of competition. Additionally, firms are less likely to switch banks after a merger, especially if concentration in the banking market is large. Firms are also much more likely to drop their relationship at higher levels of bank-concentration. The effect of concentration on adds is also increasing in concentration, although only slightly. Overall the results appear to confirm, that firms decision to stay, switch and drop highly depends on the alternatives available to the firm. The more concentrated the banking market, the less likely firms are to switch banks and the more likely they are to drop their relationship. This is in line with the prior interpretation that firms may be underserved by their post-merger bank; if firms are in a more concentrated

market and have fewer alternatives, they cannot switch to other banks and instead either stay or drop their relationship.

FIGURE 2 AROUND HERE

FIGURE 3 AROUND HERE

For buying mergers, we find quite different results. Firms are more likely to stay with their bank after the merger, but this effect is almost independent of the level of banking market concentration. Similar findings hold for switches. However there is a structural difference in the decision to drop; firms are more likely to drop after a buying merger in general, but are less likely to do so in more concentrated markets. This is the reverse of the target merger results. We hypothesize that buying mergers may be less intrusive than target mergers for firms, and as a result in might be more efficient for firms to stay with their bank than dropping the relationship outright and perhaps trying to find other forms of financing.

If firms experience a drop in loan supply following a bank merger that induces them to seek a switch of banks or financing more generally, firms that can offer more collateral should have an easier time to find another bank and as a result experience fewer drops. We test this by interacting the merger dummy with a dummy indicating the firms collateral. Because we are limited to balance sheet data for firms, we use the log of tangible fixed assets as a proxy for the firms assets that can be credibly pledged as collateral. We show the marginal effects of this interaction in Figure 4 and Figure 5 for target and buying mergers respectively.

FIGURE 4 AROUND HERE

FIGURE 5 AROUND HERE

Figure 4 shows that the decision to stay is negatively correlated with the level of available collateral. Additionally, firms are less likely to switch after their bank has been subject to a target merger, and this probability increases significantly with the level of available collateral. While low-collateral firms are more likely to drop their relationship by 5 percentage points, high collateral firms are much less likely to drop their relationship after a firm's bank has been the target of a merger. Interestingly, adds are also less frequent with increasing collateral, indicating that available collateral is specifically important for the ability to switch from one bank to the other, rather than for obtaining post-merger funding in general.

For stays, switches and adds the effects of collateral on the post-buying merger banking decision is similar to the target merger decision (Figure 5).[11] Firms are slightly more likely to stay after a buying merger by 0.1 percentage points. But while having more collateral increases that probability, it is only a small effect. Switches are more likely, if the firm has more collateral. While the probability of switching increases after the merger by less than 1 percentage point for the lowest collateral firms, it increases by 3 percentage points for the highest collateral firms. Interestingly, the probability to drop after a buying merger *increases* with the available collateral.

4.3 Robustness

Because the merger events may not be the same over time, our pre- and post- merger periods may be systematically different across the time dimension. This may be problematic for

[11] The corresponding output of the logit regression without marginal effects can be found in Table OA2

the estimation of the standard errors. Similar concerns are also raised by the difference-in-difference style setup of our regression (Bertrand et al., 2004). As a result, we test if our results hold, if we remove the time dimension from the estimation. In order to do so, we collapse the sample to pre- and post merger periods, and re-estimate our regressions. We provide the table for this robustness check for our competition interaction in Table OA3 and the figures for the marginal effects at different levels of HHI in Figures OA1 and OA2. The results of these regressions is very similar to the results of the previous estimations for the target mergers. We proceed the same way with our interactions regarding firm collateral. The results are given in Table OA4 and Figures OA3 and OA4. All marginal effects graphs look almost identical in the collapsed and non-collapsed sample, leading us to conclude that our results are robust with regard to collapsing the sample.

TABLE 4 AROUND HERE

Because the decision to stay, switch, drop or add banks following a bank merger is not really independent from each other, we also estimate our baseline regression using a multinomial logit model. Whereas this model lends itself to investigating the baseline decision after the merger, using in in conjunction with our competition and collateral measure produces findings that may be difficult to interpret. As a result, we only estimate the basic interaction as a multinomial logit, to confirm that our baseline results hold. Table 5 confirms that this is indeed the case. Firms are less likely to switch to another bank following a bank merger, more likely to drop their bank relationship and marginally more likely to add another bank. We also confirm, that for buyer mergers all choices are more likely when compared with the base case.

5 Conclusion

Our paper confirms the previous literature by finding that bank-mergers can be harmful for firms. In line with Di Patti and Gobbi (2007) and Degryse et al. (2011), we demonstrate that firms suffer most extensively when their bank relationship drops following a bank merger. We add to this literature in two significant ways. First, we are first to show that firms who are able to *add* a bank relationship after a merger can benefit from the merger, as they perform much better than firms who stayed, switched or dropped their firm. This finding is novel and somewhat unexpected, because bank mergers should be unrelated to the firms demand (to add another bank). We suggest that this finding can be explained by the fact that post-merger firms are subject to a lending reduction from the merging bank, and as a result adding another bank to compensate the funding shortfall is highly beneficial. These findings would be in line with the idea that bank mergers destroy bank-customer relationships (Allen et al., 2016) and as a result induce firms to seek alternative financing means. We thus provide a potential explanation for the puzzle demonstrated in Degryse et al. (2011) that bank-mergers lead to the dropping of high-quality borrowers, instead of low-quality borrowers.

We then demonstrate that the ability to find other such means of financing in the banking system crucially depends on the available competition and the available collateral. Firms in more competitive banking environments are more likely to switch and less likely to drop their bank relationship than other firms. Similar findings hold for collateral; firms with more collateral have an easier time switching to different banks. We thus provide evidence towards the fact that the environment in which bank-mergers take place are very important in order to evaluate their economic impact. While bank mergers in somewhat competitive markets may be less harmful, bank mergers in already highly concentrated markets will

lead to an increase in firm-bank relationship drops with the resulting negative consequences for firms, suggesting that bank-competition may be important not only for pricing, but for (efficient) continuations of bank-firm relationships.

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Figures and Tables

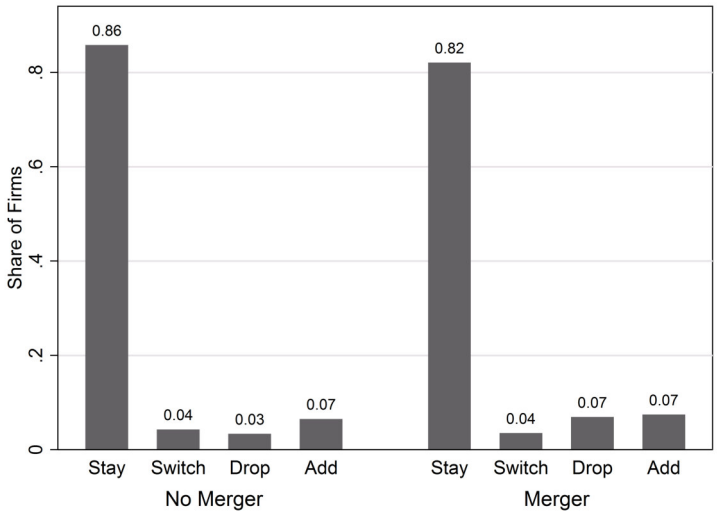

Figure 1: Bank relationship decisions after bank merger (target)

This Figure shows the relative share of relationship continuations (Stay), switches to another bank (Switch), dropping of a bank relationship (Drop) and adding an additional bank relationship (Add) at any point in time, by firms' banks participation in a merger (target). Share of firms sums to 1 for each respective group, as we exclude all firms, for which switches, drops and adds occur simultaneously.

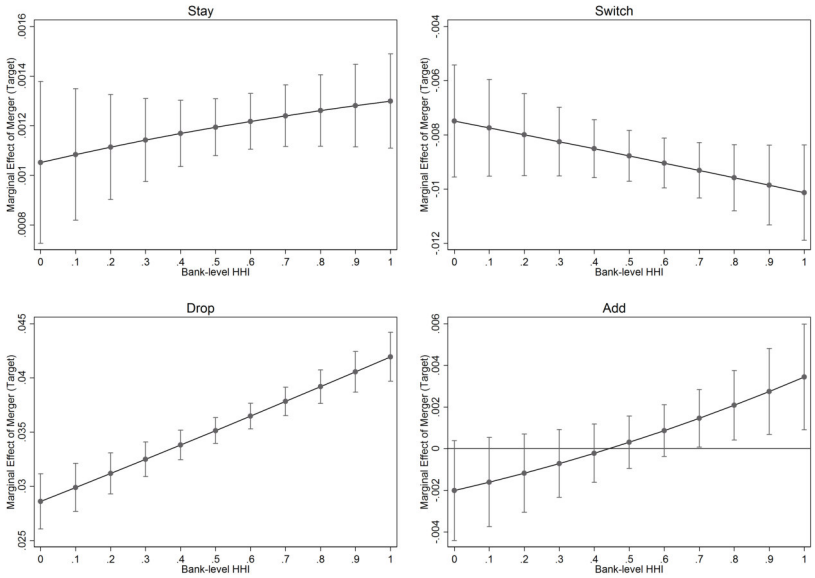

Figure 2: Marginal Effect of merger (target) on relationship decision, by level of banking market concentration

This figure plots the marginal effect of a firms' bank being target of the merger on the firms decision to stay, switch, drop or add a bank at different levels of banking concentration in the firms county. The corresponding table without marginal effects is given in Table OA1. The error bars represent the 90% confidence intervals. HHI is the banking market Herfindahl Hirschman Index; the closer the index is to 1 the more concentrated is the banking market.

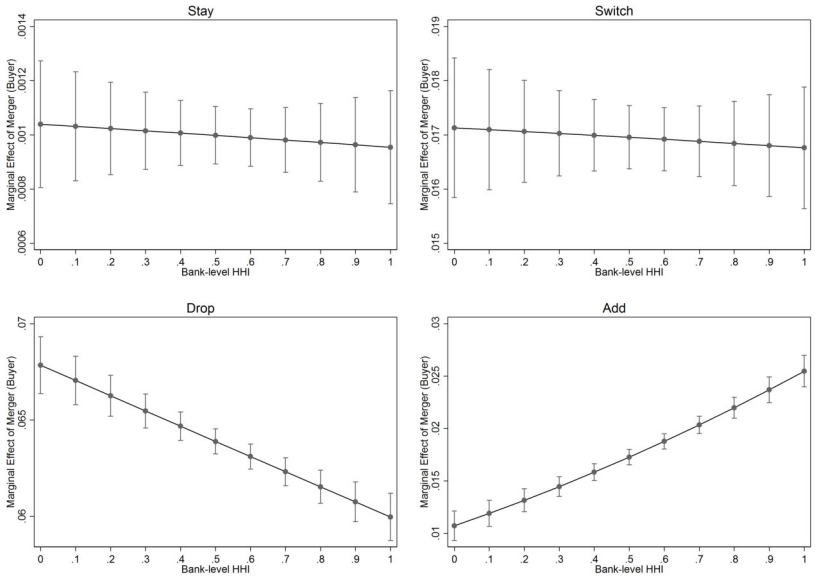

Figure 3: Marginal Effect of merger (buyer) on relationship decision, by level of banking market concentration

This figure plots the marginal effect of a firms' bank being buyer in a bank merger on the firms decision to stay, switch, drop or add a bank, at different levels of banking concentration in the firms county. The corresponding table without marginal effects is given in Table OA1. The error bars represent the 90% confidence intervals. HHI is the banking market Herfindahl Hirschman Index; the closer the index is to 1 the more concentrated is the banking market.

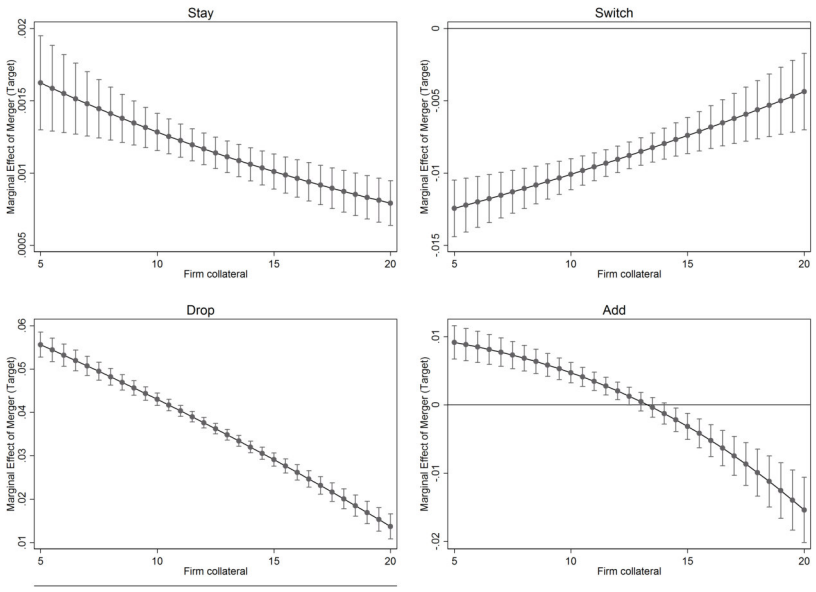

Figure 4: Marginal Effect of merger (target) on relationship decision, by firms' collateral

This figure plots the marginal effect of a firms' bank being target in a bank merger on the firms decision to stay, switch, drop or add a bank, at different levels of the firms available collateral. Collateral is defined as the log of tangible fixed assets of the firm. The corresponding table without marginal effects is given in Table OA2. The error bars represent the 90% confidence intervals.

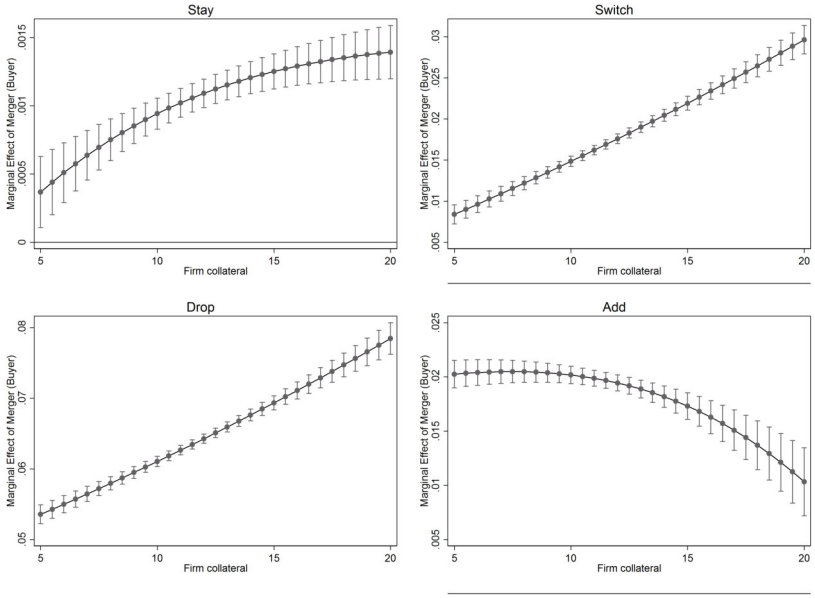

Figure 5: Marginal Effect of merger (buyer) on relationship decision, by firms' collateral

This figure plots the marginal effect of a firms' bank being buyer in a bank merger on the firms decision to stay, switch, drop or add a bank,at different levels of the firms available collateral. Collateral is defined as the log of tangible fixed assets of the firm. The corresponding table without marginal effects is given in Table OA2. The error bars represent the 90% confidence intervals.

Table 1: Descriptive Statistics

	N	Mean	SD	Min	Max
Merger Variables					
Merger Target	2024025	0.08	0.27	0.00	1.00
Merger Buyer	2024025	0.36	0.48	0.00	1.00
Relationship (dis-)continuation Variables					
Switch (Target)	2024025	0.06	0.23	0.00	1.00
Drop (Target)	2024025	0.06	0.24	0.00	1.00
Add (Target)	2024025	0.10	0.30	0.00	1.00
Switch (Buyer)	2024025	0.05	0.23	0.00	1.00
Drop (Buyer)	2024025	0.06	0.24	0.00	1.00
Add (Buyer)	2024025	0.09	0.29	0.00	1.00
Interaction Variables					
HHI	2024025	0.56	0.26	0.12	1.00
Collateral	2024025	10.97	3.40	0.00	23.77
Firm Outcome Variables					
Loans (mil.EUR)	1203880	0.54	15.63	0.00	5255
Interest Rate	354116	0.03	0.73	-0.10	395.45
Trade Credit (mil.EUR)	1203774	0.81	23.71	0.00	6119
Total Fixed Assets (mil.EUR)	2024025	2.94	65.70	0.00	21127
Number of Employees	1315985	60.06	984.95	1.00	276418
Return on Equity	337095	0.34	1.17	-10.00	10.00
Firm Control Variables					
L.Cash (mil.EUR)	2024025	0.85	27.30	0.00	15119
L.Total Assets (mil.EUR)	2024025	12.59	414.56	0.00	126562
L.Capital Ratio	2024025	0.34	0.28	0.00	1.00
L.Current Liabilities (mil.EUR)	2024025	3.10	122.42	0.00	30052

This table presents summary statistics for all variables of interest. Merger Target and Merger Buyer are dummy variables set equal to 1 after the firms' bank has been target or buyer in a merger, respectively, and 0 otherwise. Switch (Target/Buyer) is a dummy variable set equal to 1 if a post or pre-merger change of the bank relationship has taken place. Drop (Target/Buyer) is a dummy variable set equal to 1 if the bank relationship is dropped before or after the merger. Add (Target/Buyer) is a dummy set equal to 1 if another bank relationship is added after a merger. All dummy variables are 1 before or after the merger has taken place, never both. HHI is the bank-level Herfindahl Hirschmann Index (with the county as the regional unit), based on the concentration of bank assets. Collateral is the log of tangible fixed assets. Interest rate is calculated as interest income / total loans. Firm control variables are lagged by one period.

Table 2: Unconditional Merger Regressions

	Target						Buyer					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Loans	Interest rate	Trade Cred.	Collateral	Employees	RoE	Loans	Interest rate	Trade Cred.	Collateral	Employees	RoE
Merger Target	-0.130***	0.007**	0.050	0.015	-0.014***	-0.016						
	(0.042)	(0.004)	(0.042)	(0.010)	(0.004)	(0.012)						
Merger Buyer							-0.032	0.002	-0.003	0.009	0.009***	-0.012
							(0.023)	(0.003)	(0.024)	(0.006)	(0.002)	(0.009)
L.Cash	-0.036***	-0.001	-0.006**	0.012***	0.003***	0.006***	-0.036***	-0.001	-0.006**	0.012***	0.003***	0.006***
	(0.003)	(0.001)	(0.003)	(0.001)	(0.000)	(0.002)	(0.003)	(0.001)	(0.003)	(0.001)	(0.000)	(0.002)
L.Total Assets	0.257***	0.010***	0.133***	0.452***	0.096***	-0.137***	0.258***	0.010***	0.133***	0.452***	0.096***	-0.137***
	(0.012)	(0.003)	(0.013)	(0.006)	(0.002)	(0.009)	(0.012)	(0.003)	(0.013)	(0.006)	(0.002)	(0.009)
L.Capital Ratio	-0.681***	-0.041**	-0.395***	0.101***	0.013***	-0.918***	-0.681***	-0.041**	-0.395***	0.101***	0.013***	-0.918***
	(0.034)	(0.019)	(0.038)	(0.013)	(0.004)	(0.024)	(0.034)	(0.019)	(0.038)	(0.013)	(0.004)	(0.024)
L.Current Liabilities	0.012***	-0.000	0.017***	0.001***	0.001***	-0.000	0.012***	-0.000	0.017***	0.001***	0.001***	-0.000
	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
N	1,203,880	354,116	1,203,774	2,024,025	1,315,985	337,095	1,203,880	354,116	1,203,774	2,024,025	1,315,985	337,095
Number of Firms	378,352	98,061	378,876	463,740	387,139	91,927	378,352	98,061	378,876	463,740	387,139	91,927
Treatment Group	29,535	11,538	29,553	36,125	32,381	11,145	137,390	45,824	137,570	168,694	147,217	43,792
Adjusted R^2	0.696	0.866	0.727	0.927	0.970	0.567	0.696	0.866	0.727	0.927	0.970	0.567
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
County×time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

This table displays the effect of bank-mergers on firm-level outcomes, as formally shown in Equation 1. Columns (1)-(6) represent the effects of target mergers, while columns (7)-(12) show the effects of the firms' banks being the buying party in a merger. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. Loans is the log of all firms' bank loans (borrowing). Interest rate is total interest expense divided by total loans. Trade credit is the log of firms' trade credit. Collateral is the log of firms tangible fixed assets. Employees is the log of the firms employees. RoE is firms' return on equity. Firm and county×year fixed effects are included. Clustered standard errors on the firm level of the point estimates are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 3: Real effects of bank mergers by relationship changes

	Target						Buyer					
	(1) Loans	(2) Interest rate	(3) Trade Credit	(4) Collateral	(5) Employees	(6) RoE	(7) Loans	(8) Interest rate	(9) Trade Credit	(10) Collateral	(11) Employees	(12) RoE
Merger Target	-0.155***	0.008*	0.027	0.009	-0.011**	-0.033**						
	(0.045)	(0.004)	(0.047)	(0.010)	(0.005)	(0.014)						
Merger Target×Switch	-0.092	-0.001	-0.127	0.015	-0.022	0.063						
	(0.208)	(0.009)	(0.228)	(0.052)	(0.026)	(0.043)						
Merger Target×Drop	-0.319*	0.004	-0.149	-0.000	-0.058***	0.070**						
	(0.164)	(0.006)	(0.161)	(0.042)	(0.019)	(0.035)						
Merger Target×Add	0.394**	-0.002	0.382**	0.107***	0.032*	0.040						
	(0.162)	(0.002)	(0.157)	(0.036)	(0.018)	(0.032)						
Merger Buyer							-0.058**	0.002	-0.031	-0.003	0.000	-0.014
							(0.024)	(0.004)	(0.026)	(0.006)	(0.002)	(0.011)
Merger Buyer×Switch							-0.031	0.008	0.054	0.020	0.023**	-0.020
							(0.107)	(0.006)	(0.110)	(0.029)	(0.012)	(0.040)
Merger Buyer×Drop							-0.022	0.003	0.251**	0.022	0.022*	0.032
							(0.118)	(0.003)	(0.117)	(0.029)	(0.013)	(0.028)
Merger Buyer×Add							0.358***	-0.000	0.254***	0.120***	0.070***	0.006
							(0.089)	(0.003)	(0.091)	(0.021)	(0.008)	(0.024)
N	1,083,401	310,713	1,083,382	1,930,476	1,208,497	295,225	1,084,377	311,120	1,084,379	1,932,037	1,209,573	295,559
Number of Firms	287,223	74,563	287,719	414,629	311,650	69,166	287,488	74,704	287,983	414,929	311,941	69,287
Treatment Group	28,102	10,547	28,121	34,522	30,810	10,184	132,521	42,555	132,700	163,441	142,056	40,616
Adjusted R^2	0.704	0.245	0.733	0.926	0.969	0.516	0.703	0.245	0.732	0.926	0.969	0.517
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
County×time FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

This table shows the effects of bank mergers on firms, given that the firm switched, dropped or added a bank relationship after the merger. Switch, drop and add are values from 1,2 and 3 from a categorical variable indicating the post-merger relationship status. Staying is the base category. Columns (1)-(6) represent the effects of target mergers, while columns (7)-(12) show the effects of the firms' banks being the buying party in a merger. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. Loans is the log of all firms' bank loans (borrowing). Interest rate is total interest expense divided by total loans. Trade credit is the log of firms' trade credit taken. Collateral is the log of firms tangible fixed assets. Employees is the log of the firms employees. RoE is firms' return on equity. Firm-level control variables are included, but not displayed. Firm and county×year fixed effects are included. Clustered standard errors on the firm level of the point estimates are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 4: Decision to change bank relationship after merger: marginal effects

	Target				Buyer			
	(1) Stay	(2) Switch	(3) Drop	(4) Add	(5) Stay	(6) Switch	(7) Drop	(8) Add
Merger Target	0.002***	-0.009***	0.030***	0.001				
	(0.000)	(0.001)	(0.001)	(0.001)				
Merger Buyer					0.001***	0.016***	0.060***	0.018***
					(0.000)	(0.000)	(0.000)	(0.000)
N	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019
Number of Firms	463,736	463,736	463,736	463,736	463,736	463,736	463,736	463,736
Pseudo R^2	0.052	0.015	0.053	0.037	0.027	0.017	0.089	0.038
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Bank Controls	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

This table presents logit regressions for the decision to stay, drop, switch or add a bank-relationship conditional on the firms' banks participation in a merger. Stay is set equal to 1 if the firm does not change its bank relationships at any point in time before or after the merger. Switch, drop and add are set equal to 1 if at any point in time after or before the merger, the firm decides to switch to another bank, drop a bank relationship or add an additional relationship. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. The reported coefficients are marginal effects of the independent variable on the probability of staying, switching, dropping or adding the lending relationship respectively. Standard errors (delta method) are displayed in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table 5: Robustness: Results of Multinomial logit model

	(1) Switch vs. Stay	(2) Drop vs. Stay	(3) Add vs. Stay
Merger Target	-0.003***	0.005***	0.001**
	(0.000)	(0.000)	(0.000)
Merger Buyer	0.002***	0.011***	0.003***
	(0.000)	(0.000)	(0.000)
N		2,024,025	
Number of Firms		463,736	
Stays		1,934,828	
Switches		25,537	
Drops		22,660	
Adds		40,994	
Pseudo R^2		0.035	

This table presents the marginal effect of a multinomial logit regression on the decision to switch, drop or add a bank relationship compared to the base category (stay). The dependent variable is a variable that takes the value of 1 if the firm stayed with their bank relationship in any particular year, 2 if it switched to another bank, 3 if it dropped a bank relationship and 4 if it added a bank relationship. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. The reported coefficients are marginal effects. Clustered standard errors are displayed in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Appendix

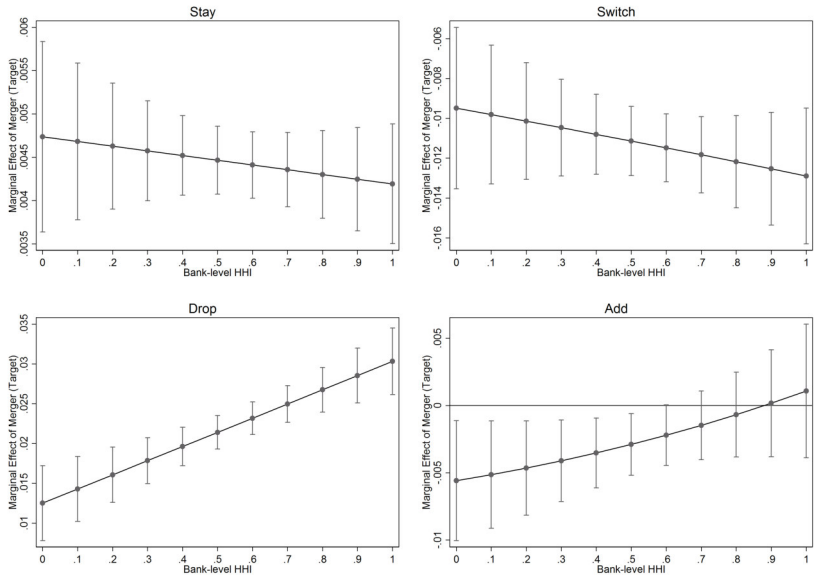

Figure OA1: Marginal Effect of merger (target) on relationship decision, by level of banking market concentration: collapsed sample

This figure plots the marginal effect of a firms' bank being target of the merger on the firms decision to stay, switch, drop or add a bank at different levels of banking concentration in the firms county, using a collapsed firm sample. The corresponding table without marginal effects is given in Table OA3. The error bars represent the 90% confidence intervals. HHI is the banking market Herfindahl Hirschman Index; the closer the index is to 1 the more concentrated is the banking market.

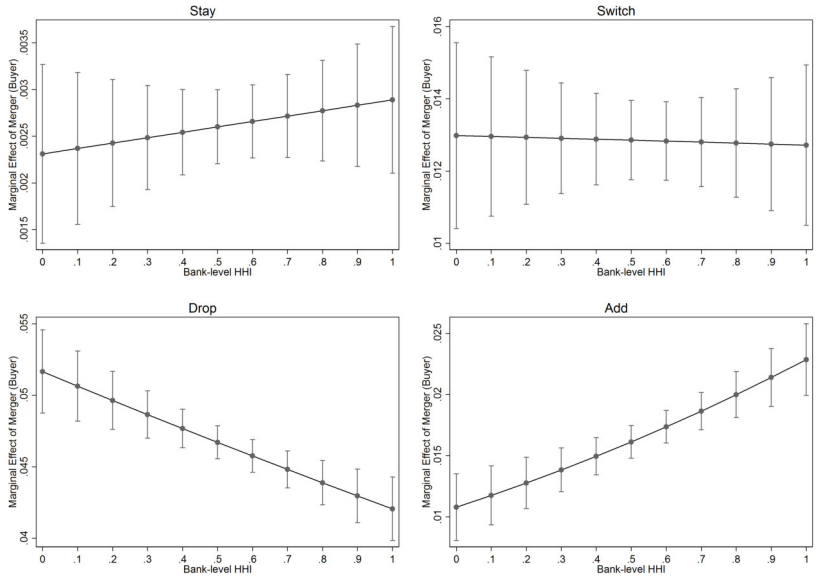

Figure OA2: Marginal Effect of merger (buyer) on relationship decision, by level of banking market concentration: collapsed sample

This figure plots the marginal effect of a firms' bank being buyer in a bank merger on the firms decision to stay, switch, drop or add a bank, at different levels of banking concentration in the firms county, using a collapsed firm sample. The corresponding table without marginal effects is given in Table OA3. The error bars represent the 90% confidence intervals. HHI is the banking market Herfindahl Hirschman Index; the closer the index is to 1 the more concentrated is the banking market.

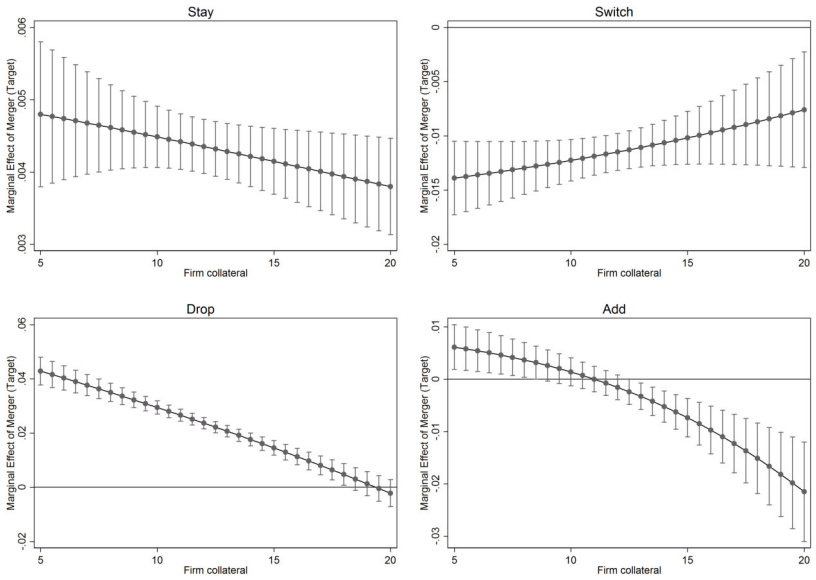

Figure OA3: Marginal Effect of merger (target) on relationship decision, by firms' collateral: collapsed sample

This figure plots the marginal effect of a firms' bank being target in a bank merger on the firms decision to stay, switch, drop or add a bank, at different levels of the firms available collateral, using a collapsed firm sample. Collateral is defined as the log of tangible fixed assets of the firm. The corresponding table without marginal effects is given in Table OA4. The error bars represent the 90% confidence intervals.

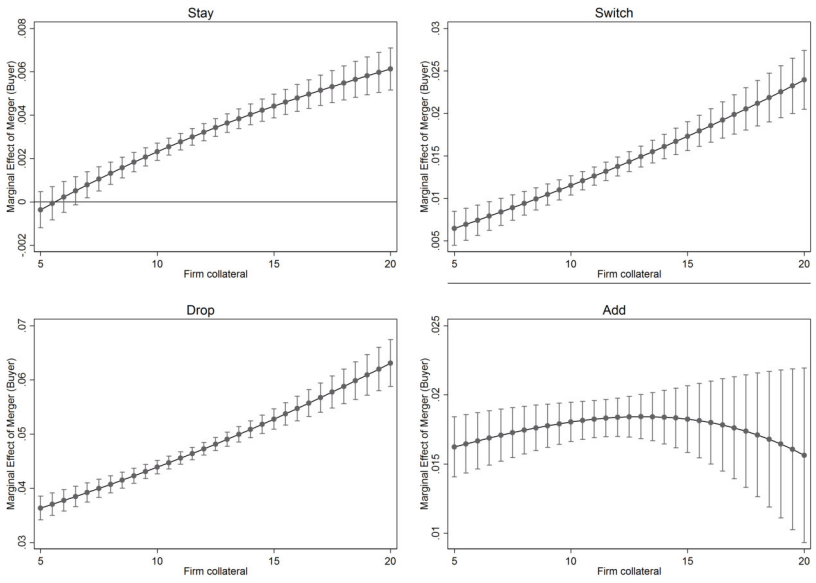

Figure OA4: Marginal Effect of merger (buyer) on relationship decision, by firms' collateral: collapsed sample

This figure plots the marginal effect of a firms' bank being buyer in a bank merger on the firms decision to stay, switch, drop or add a bank, at different levels of the firms available collateral, using a collapsed firm sample. The corresponding table without marginal effects is given in Table OA4. The error bars represent the 90% confidence intervals.

Table OA1: Decision to change bank relationship: competitive environment

	Target				Buyer			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stay	Switch	Drop	Add	Stay	Switch	Drop	Add
[1em] HHI	0.015	0.090***	-0.042***	0.370***	-0.025	0.065***	0.062***	0.313***
	(0.070)	(0.012)	(0.012)	(0.009)	(0.069)	(0.016)	(0.018)	(0.012)
Merger Target	0.957***	-0.153***	0.440***	-0.027				
	(0.284)	(0.027)	(0.021)	(0.020)				
Merger Target×HHI	0.522	-0.042	0.179***	0.062**				
	(0.481)	(0.043)	(0.033)	(0.031)				
Merger Buyer					0.567***	0.337***	1.154***	0.152***
					(0.085)	(0.015)	(0.014)	(0.012)
Merger Buyer×HHI					-0.077	-0.022	-0.126***	0.118***
					(0.137)	(0.024)	(0.023)	(0.019)
N	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019
Number of Firms	463,736	463,736	463,736	463,736	463,736	463,736	463,736	463,736
Affected Firms	36,125	36,125	36,125	36,125	168,693	168,693	168,693	168,693
Pseudo R^2	0.052	0.015	0.053	0.039	0.027	0.017	0.089	0.039
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

This table presents logit regressions for the decision to stay, drop, switch or add a bank-relationship conditional on the firms' banks participation in a merger and the banking concentration (HHI) in the firms county. HHI is the Herfindahl Hirschman Index of the banking market in the firms county. Stay is set equal to 1 if the firm does not change its bank relationships at any point in time before or after the merger. Switch, drop and add are set equal to 1 if at any point in time after or before the merger, the firm decides to switch to another bank, drop a bank relationship or add an additional relationship. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. Note that the coefficients are not marginal effects. Refer to Figure 2 and Figure 3 for the marginal effects of the merger at different levels of HHI. Standard errors are displayed in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table OA2: Decision to change bank relationship: firm collateral

	Target				Buyer			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stay	Switch	Drop	Add	Stay	Switch	Drop	Add
[1em] Collateral	0.055***	0.007***	0.037***	0.073***	0.020***	-0.001	0.033***	0.080***
	(0.006)	(0.001)	(0.001)	(0.001)	(0.006)	(0.001)	(0.002)	(0.001)
Merger Target	1.053***	-0.328***	1.110***	0.232***				
	(0.375)	(0.045)	(0.034)	(0.036)				
Merger Target×Collateral	0.016	0.012***	-0.046***	-0.017***				
	(0.031)	(0.004)	(0.003)	(0.003)				
Merger Buyer					-0.186*	0.053**	1.103***	0.445***
					(0.102)	(0.023)	(0.024)	(0.021)
Merger Buyer×Collateral					0.066***	0.024***	-0.001	-0.018***
					(0.009)	(0.002)	(0.002)	(0.002)
N	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019	2,024,019
Number of Firms	463,736	463,736	463,736	463,736	463,736	463,736	463,736	463,736
Affected Firms	36,125	36,125	36,125	36,125	168,693	168,693	168,693	168,693
Pseudo R^2	0.054	0.015	0.054	0.041	0.029	0.018	0.090	0.041
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

This table presents logit regressions for the decision to stay, drop, switch or add a bank-relationship conditional on the firms' banks participation in a merger and the firms available collateral. Collateral is defined as the log of firms' tangible fixed assets. Stay is set equal to 1 if the firm does not change its bank relationships at any point in time before or after the merger. Switch, drop and add are set equal to 1 if at any point in time after or before the merger, the firm decides to switch to another bank, drop a bank relationship or add an additional relationship. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. Note that the coefficients are not marginal effects. Refer to Figure 4 and Figure 5 for the marginal effects of the merger at different levels of firms' collateral. Standard errors are displayed in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table OA3: Robustness: Collapsed sample for HHI interaction

	Target				Buyer			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stay	Switch	Drop	Add	Stay	Switch	Drop	Add
HHI	0.191**	0.104***	-0.176***	0.389***	-0.037	0.072**	-0.013	0.332***
	(0.081)	(0.028)	(0.030)	(0.023)	(0.078)	(0.035)	(0.043)	(0.028)
Merger Target	1.243***	-0.234***	0.237***	-0.096**				
	(0.308)	(0.066)	(0.050)	(0.048)				
Merger Target×HHI	0.188	-0.064	0.337***	0.109				
	(0.517)	(0.107)	(0.081)	(0.075)				
Merger Buyer					0.355***	0.295***	1.100***	0.184***
					(0.096)	(0.034)	(0.034)	(0.028)
Merger Buyer×HHI					0.091	-0.021	-0.134**	0.102**
					(0.157)	(0.056)	(0.056)	(0.044)
N	482,813	482,813	482,813	482,813	518,269	518,269	518,269	518,269
Affected Firms	36,125	36,125	36,125	36,125	168,693	168,693	168,693	168,693
Pseudo R^2	0.015	0.014	0.055	0.042	0.010	0.015	0.078	0.042
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

This table presents logit regressions for the decision to stay, drop, switch or add a bank-relationship conditional on the firms' banks participation in a merger and the banking concentration (HHI) in the firms county, using a collapsed sample of the data. HHI is the Herfindahl Hirschman Index of the banking market in the firms county. Stay is set equal to 1 if the firm does not change its bank relationships at any point in time before or after the merger. Switch, drop and add are set equal to 1 if at any point in time after or before the merger, the firm decides to switch to another bank, drop a bank relationship or add an additional relationship. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. Note that the coefficients are not marginal effects. Refer to Figure OA1 and Figure OA2 for the marginal effects of the merger at different levels of HHI. Standard errors are displayed in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Table OA4: Robustness: Collapsed sample for collateral interaction

	Target				Buyer			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stay	Switch	Drop	Add	Stay	Switch	Drop	Add
Collateral	0.026***	0.013***	0.044***	0.081***	-0.014**	0.006**	0.038***	0.086***
	(0.006)	(0.003)	(0.003)	(0.003)	(0.007)	(0.003)	(0.004)	(0.003)
Merger Target	1.005**	-0.442***	1.149***	0.227***				
	(0.396)	(0.103)	(0.075)	(0.080)				
Merger Target×Collateral	0.030	0.014*	-0.059***	-0.021***				
	(0.033)	(0.008)	(0.006)	(0.006)				
Merger Buyer					-0.448***	0.055	0.996***	0.425***
					(0.112)	(0.047)	(0.052)	(0.044)
Merger Buyer×Collateral					0.080***	0.020***	0.003	-0.015***
					(0.010)	(0.004)	(0.004)	(0.004)
N	482,813	482,813	482,813	482,813	518,269	518,269	518,269	518,269
Number of Firms	463,736	463,736	463,736	463,736	463,736	463,736	463,736	463,736
Affected Firms	36,125	36,125	36,125	36,125	168,693	168,693	168,693	168,693
Pseudo R^2	0.016	0.014	0.057	0.045	0.011	0.015	0.079	0.045
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES

This table presents logit regressions for the decision to stay, drop, switch or add a bank-relationship conditional on the firms' banks participation in a merger and the firms available collateral, using a collapsed data sample. Collateral is defined as the log of firms' tangible fixed assets. Stay is set equal to 1 if the firm does not change its bank relationships at any point in time before or after the merger. Switch, drop and add are set equal to 1 if at any point in time after or before the merger, the firm decides to switch to another bank, drop a bank relationship or add an additional relationship. Merger Target is a dummy variable set equal to 0 if the firms' banks have not been the target of a merger and set equal to 1 after any of the firms' banks have been the target of a merger. Merger Buyer is a dummy set equal to 0 if the firms' bank have not been the buying party in a merger and set equal to 1 if any of the firms' banks have been the buying party in a bank merger. Note that the coefficients are not marginal effects. Refer to Figure OA3 and Figure OA4 for the marginal effects of the merger at different levels of firms' collateral. Standard errors are displayed in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.