The Real Effects of Lending Relationship Disruptions: Evidence from Bank Mergers

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Abstract

We examine how bank mergers affect lending relationships and borrower outcomes using comprehensive U.S. corporate loan data from 1986-2018. Exploiting the staggered timing of bank mergers within a difference-in-differences framework, we find that target-bank borrowers experience significantly lower probabilities of relationship continuation compared to borrowers of non-merging banks, while acquirer-bank borrowers face only modest reductions. This effect is particularly pronounced for borrowers whose credit evaluation relies heavily on soft information. Target-bank borrowers also face substantial barriers in obtaining credit from other lenders relative to acquirer-bank borrowers. These financing frictions translate into real effects: target-bank borrowers reduce investment by 2.96 percentage points and increase their probability of workforce reductions by 11.1 percentage points relative to borrowers of non-merging banks. Our findings suggest that organizational disruptions from bank mergers can significantly impact the real economy through the relationship lending channel.

Keywords: Bank Mergers, Lending Relationships, Soft Information, Real Effects

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1. Introduction

On February 7, 2019, BB&T announced its $66 billion acquisition of SunTrust Banks, resulting in the creation of Truist Financial, now the sixth-largest retail bank in the United States(Truist Financial Corporation, 2019). This landmark deal, the largest U.S. bank merger since the 2008 financial crisis, revived policy debates on the real economic consequences of consolidation in the banking sector. During Congressional hearings, Federal Reserve Chair Jerome Powell emphasized the delicate balance between fostering competitive banking markets and ensuring the resilience of the financial system (Powell, 2019). The failures of Silicon Valley Bank and Signature Bank in 2023, which triggered significant banking sector stress, have further intensified discussions on the trade-offs associated with bank size, concentration, and market structure(Government Accountability Office, 2023; Bank for International Settlements, 2023; International Monetary Fund, 2023). These episodes underscore a fundamental economic tension: while bank mergers can achieve operational efficiencies through economies of scale, they also disrupt established lending relationships that facilitate the flow of soft information and credit allocation (Berger and Humphrey, 1993; Stein, 2002). This tension has become increasingly relevant given the dramatic consolidation of U.S. banking markets—the number of FDIC-insured commercial banks declined from 13,123 in 1988 to 4,715 in 2018, while mean bank assets grew from $238 million to $3.5 billion (Federal Deposit Insurance Corporation, 1988, 2018). Despite extensive research on bank mergers, we have limited understanding of how relationship disruptions stemming from consolidation affect borrowers' real economic outcomes.

This paper addresses this critical gap by testing a theoretical framework that integrates insights from organizational economics with empirical evidence on relationship lending. Building on Stein (2002)'s theory of hierarchical versus decentralized organizations, we argue that bank mergers fundamentally alter how soft information is produced and transmitted within lending organizations. When banks merge, the increased organizational complexity

and hierarchical structure particularly affect the target bank's ability to maintain its relationship lending practices. The target bank must adapt to the acquirer's organizational structure and credit policies, potentially disrupting established channels for processing soft information (Berger et al., 2005; Liberti and Petersen, 2019). This organizational friction, as highlighted by Aghion and Tirole (1997), manifests itself through changes in both formal and real authority over lending decisions, with target banks typically ceding significant control to the acquiring institution's hierarchy (Davis Polk & Wardwell LLP, 2024).

The theoretical framework generates three testable predictions regarding the differential effects of merger-induced disruptions to lending relationships. First, borrowers with pre-merger relationships with target banks should experience more severe disruptions than those with acquiring banks, as target institutions undergo substantial organizational restructuring to conform with acquirers' policies and procedures. Second, these disruptions should be most pronounced for borrowers whose creditworthiness assessment depends heavily on soft information, reflecting the inherent difficulties of transmitting such information through more complex organizational hierarchies. Third, the relationship-specific nature of soft information suggests that affected borrowers should face significant barriers to both maintaining credit relationships with the merged entity and establishing new lending relationships elsewhere.

To test these predictions empirically, we construct a comprehensive dataset of U.S. corporate loans spanning 1986 to 2018, encompassing 112,474 unique loan contracts issued by 1,042 lead lenders to 32,327 borrowers. Our identification strategy exploits the staggered timing of bank mergers within a difference-in-differences framework, comparing outcomes for firms whose relationship lenders merge to those whose lenders do not. This approach, combined with high-dimensional fixed effects and time-varying controls (Khwaja and Mian, 2008; Sutherland, 2018), enables us to isolate the causal impact of relationship disruptions while accounting for concurrent changes in firm and bank characteristics.

Our empirical analysis yields three main findings that strongly support the theoretical predictions. First, we document substantial heterogeneity in relationship continuation

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probabilities following bank mergers. Target-bank borrowers experience a 23.9 percentage point lower probability of maintaining lending relationships compared to non-merging bank borrowers, while acquirer-bank borrowers face a 6.1 percentage point reduction. This stark difference in relationship stability between target and acquirer banks' borrowers persists after controlling for bank-year and firm-year fixed effects, suggesting that organizational integration particularly disrupts target banks' relationship lending practices. This relationship disruption effect is particularly pronounced for borrowers whose credit evaluation relies more heavily on soft information. Second, when pre-merger loans mature, affected borrowers face significant frictions in securing alternative financing. Target-bank borrowers face a 33.2 percentage point lower probability of obtaining credit from other lenders compared to those with pre-merger relationships with acquirer banks. Third, these financing frictions translate into significant real economic outcomes. Target-bank borrowers reduce investment by 2.96 percentage points (scaled by total assets) and increase their probability of workforce reductions by 11.1 percentage points relative to borrowers of non-merging banks. In contrast, acquirer-bank borrowers show much less significant changes in real outcomes. The economic magnitude of these effects is substantial - even the differential impact on investment between target and acquirer banks' borrowers accounts for approximately $116.76 billion during our sample period. This asymmetric effect on target versus acquirer banks' borrowers provides novel evidence that organizational disruptions from bank mergers can significantly impact the real economy through the relationship lending channel.

Our analysis makes several important contributions to multiple strands of literature. First, we advance the banking consolidation literature by providing novel evidence on how organizational disruptions from mergers affect relationship lending and borrower outcomes. While prior work has examined various aspects of bank mergers including operational efficiency (Berger, 1998; Haynes and Thompson, 1999), market power and social outcomes (Garmaise and Moskowitz, 2006), and information disclosure (Chen and Vashishtha, 2017), relatively few studies have investigated the direct impact of mergers on borrower-level out-

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comes. Degryse et al. (2011) examine how bank mergers affect lending relationships using Belgian data and find that borrowers with single banking relationships face higher termination rates post-merger. We extend this line of inquiry by establishing a direct causal link between merger-induced organizational changes and borrowers' real economic outcomes through the relationship lending channel in the U.S. context. Our analysis leverages comprehensive loan-level data and a novel identification strategy to isolate the transmission of organizational disruption to borrower outcomes. Our findings complement earlier studies on the stock market reaction to merger announcements (Karceski et al., 2005) by documenting the actual changes in lending relationships and subsequent effects on corporate investment and employment.

Second, we add to the literature on relationship lending by demonstrating how changes in banks' organizational structure shape the dynamics of lending relationships. While prior research has established that lending relationships depend on various factors including geographic proximity (Petersen and Rajan, 1995; Degryse and Ongena, 2005), pre-existing connections (Bharath et al., 2007; Karolyi, 2018), and banks' capital structure (Schwert, 2018), relatively few studies have investigated the direct impact of mergers on relationship stability. Degryse et al. (2011) examine how bank mergers affect lending relationships using Belgian data and find that borrowers with single banking relationships face higher termination rates post-merger. We extend this line of inquiry by showing that organizational hierarchy following mergers can fundamentally alter banks' ability to maintain relationship-based lending, particularly when target banks must integrate into acquirers' more complex structures. Using a novel measure of soft information intensity in lending relationships, we provide evidence that organizational complexity induced by bank mergers creates significant frictions in the transmission of relationship-specific information, leading to disruptions in established lending patterns.

Third, our paper contributes to a broader literature on how organizational design affects information production and resource allocation in financial intermediation. Building on

theories of formal versus real authority in organizations (Aghion and Tirole, 1997; Stein, 2002), we show that bank mergers alter both the formal control over lending decisions and loan officers' effective ability to act on locally-produced information. When target banks are integrated into acquirers' hierarchies, the separation between formal and real authority becomes more pronounced, reducing incentives to collect and transmit soft information. This mechanism helps explain our finding that target bank borrowers experience more severe lending disruptions, particularly those borrowers about which soft information plays a crucial role in lending decisions. Our work complements recent evidence from Skrastins and Vig (2019), who examine how organizational hierarchy affects credit allocation in Indian banks.

Our findings have important implications for bank regulation and merger policy. While consolidated banking organizations may achieve certain operational efficiencies (Berger et al., 1999), our results suggest these benefits should be weighed against potential disruptions to relationship-based lending that can affect borrowers' real outcomes. These trade-offs are particularly relevant as regulators consider reforms to bank merger oversight in the wake of recent bank failures and amid continued technological change in the financial sector. The significant real effects we document—including reduced investment and increased layoffs among affected borrowers—highlight how organizational frictions in financial intermediation can propagate to the broader economy.

2. Bank Mergers and Lending Relationships

2.1. Institutional Setting

The study leverages the U.S. banking sector, a fertile ground for investigating the dynamics of lending relationships amidst consolidation waves. Over the decades, significant mergers among U.S. banks have reshaped the financial landscape. Notably, from 1986 to 2018, the number of FDIC-insured commercial banks declined dramatically, with their average asset size increasing by a factor of 17, from 200 million to 3.4 billion, reflecting both organic

growth and acquisition activity (Statista Research Department, 2023; **?**).

Several institutional features and regulatory developments precipitated this consolidation wave. First, the relaxation of interstate banking restrictions through the Riegle-Neal Interstate Banking and Branching Efficiency Act of 1994 removed significant barriers to geographic expansion. Second, the repeal of Glass-Steagall through the Gramm-Leach-Bliley Act of 1999 enabled the formation of universal banks, spurring consolidation between commercial and investment banking institutions. Third, technological advancement and increased competition incentivized banks to pursue economies of scale through mergers and acquisitions.

The 2023 failures of Silicon Valley Bank and Signature Bank have renewed policy debates regarding the implications of bank size, concentration, and market structure for financial stability (Government Accountability Office, 2023; Bank for International Settlements, 2023; International Monetary Fund, 2023; International Monetary Fund, 2023). These episodes underscore a fundamental economic tension: while bank mergers can achieve operational efficiencies through economies of scale, they also disrupt established lending relationships that facilitate the flow of soft information and credit allocation (Berger and Humphrey, 1993; Stein, 2002).

Our empirical strategy exploits several features of this setting. First, the staggered timing of bank mergers across different geographic markets and years provides variation in relationship disruptions. Second, many borrowers maintain relationships with multiple banks that become different merger partners (acquirer versus target) in distinct mergers, enabling us to implement within firm-time estimators that account for unobservable firm-specific shocks. Third, the richness of our loan-level data allows us to observe both relationship terminations and formations around merger events, providing a comprehensive view of how consolidation affects credit relationships and subsequent real outcomes.

This institutional environment is particularly well-suited for studying relationship lending disruptions because relationship-specific investments by both banks and borrowers were

substantial during our sample period. The substantial duration of relationships and the high frequency of loan initiations in our sample indicate a significant accumulation of relationship-specific capital, which mergers have the potential to disrupt. Moreover, the dramatic reduction in the number of banks implies fewer potential alternative relationship lenders, potentially amplifying the real effects of relationship disruptions on borrower firms.

2.2. Data

To examine the impact of bank mergers on lending relationships, we compiled a comprehensive dataset capturing detailed information on loan-level transactions and merger activities. This dataset facilitates an in-depth exploration of how mergers affect established lending relationships. Our primary data source is the Loan Pricing Corporation's (LPC) Dealscan database, which provides granular information on syndicated loan contracts, including loan terms, borrower-lender relationships, and facility characteristics. Bank merger data are sourced from the Chicago Federal Reserve's Bank Merger Database, offering extensive coverage of U.S. bank mergers. This dataset includes the identities of acquiring and target banks, merger dates, and merger classifications.

To ensure accurate linkage between loan facilities and bank merger events, we manually matched lead lenders from the Dealscan database to banks' RSSD identifiers using information from Dealscan and the FDIC platform. This process resulted in an initial dataset capturing 3,638 merger events during our sample period. By restricting each facility to its earliest associated merger event within the sample period, we identified 789 distinct merger events.

Table 1 shows how prevalent that borrowers are affected by bank mergers. For example, in 1988, of all borrowers, about 30.9% were affected by mergers. The proportion of affected borrowers increased substantially over time. By 1998, among the total borrowers, approximately 66.7% were affected by merger activities.

The intensity of merger effects relative to bank mergers has also increased. In 1988, 230

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bank mergers affected 240 borrowers (ratio of 1.04 borrowers per merger), while in 2008, 77 mergers affected 7,904 borrowers (ratio of 102.6 borrowers per merger), representing a dramatic increase in the scope of merger impacts on borrowing relationships.

Table 2 presents summary statistics for the key variables in the dataset, providing an overview of the loans, lenders, and affected borrowers included in the analysis. The facility dataset spans 1986 to 2015 and includes 98,843 unique loan contracts issued by 1,000 lead lenders to 29,282 borrowers. After excluding records with missing loan control variables, the primary estimation sample consists of 43,175 facility-level observations, issued by 828 banks to 13,058 borrowers. On average, loan facilities are sizable, with a mean loan size of $318.90 million and 75% of loans being secured.

2.3. Empirical Specification and Results

We employ a difference-in-differences (DiD) framework that leverages the variation in merger timing and the roles of lenders (acquirers versus targets) in merger events. This approach isolates the effects of mergers on lending relationship stability by comparing changes in borrower behavior across merging and non-merging banks over time.

2.3.1 Baseline Specification

The primary regression model is specified as follows:

$$\mathrm{Pr(Continue)}_{i,c,b,t} = \beta_1 \mathrm{Acquire}_{i,c,b,t} + \beta_2 \mathrm{Target}_{i,c,b,t} + \boldsymbol{\gamma}_c \times \boldsymbol{\delta}_t + \boldsymbol{\alpha}_b \times \boldsymbol{\delta}_t + \mathbf{X}_{i,c,b,t}\boldsymbol{\beta} + \varepsilon_{i,c,b,t},$$

where:

- $\mathrm{Pr(Continue)}_{i,c,b,t}$ is the dependent variable, an indicator equal to one if borrower c continues to borrow from lender b or its acquirer within six years of the loan facility i's issuance date t, and zero otherwise.

- $\mathrm{Acquire}_{i,c,b,t}$ and $\mathrm{Target}_{i,c,b,t}$ are indicator variables that equal one if lender b is an

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acquirer or target in a merger event, respectively, during the forward-looking six-year window.

- $\boldsymbol{\gamma}_c \times \boldsymbol{\delta}_t$ represents firm-year fixed effects, controlling for time-varying borrower characteristics, such as credit demand or financial health, that may influence loan continuation.

- $\boldsymbol{\alpha}_b \times \boldsymbol{\delta}_t$ denotes bank-year fixed effects, capturing time-varying characteristics of banks, such as changes in strategy, market conditions, or regulatory influences.

- $\mathbf{X}_{i,c,b,t}$ is a vector of loan-level control variables, including loan size, pricing, collateral status, and maturity.

- $\varepsilon_{i,c,b,t}$ is the error term.

2.3.2 Primary Results on Lending Relationship Disruptions

Table 3 presents our main findings on how bank mergers affect lending relationship continuation, using our most comprehensive specification with both firm-by-year and bank-by-year fixed effects to control for time-varying borrower and lender characteristics.

[Insert Table 3 Here]

The results demonstrate that bank mergers significantly disrupt existing lending relationships, with particularly severe effects for target banks. Specifically, target-bank borrowers experience a 45.3 percentage point reduction in the probability of relationship continuation compared to borrowers of non-merging banks. This effect is both economically and statistically significant at the 1% level. While acquirer-bank borrowers also face disruptions, the magnitude is notably smaller at 30.0 percentage points. The substantial magnitude of these effects suggests that bank mergers create significant frictions in relationship lending. For

target banks in particular, the sharp decline in relationship continuation probability indicates that organizational integration following mergers fundamentally impairs their ability to maintain existing lending relationships. This finding aligns with our theoretical prediction that target banks struggle to preserve relationship-specific information as they adapt to acquirers' organizational structures and lending practices.

The stark difference in continuation probabilities is particularly noteworthy given our inclusion of bank-by-year fixed effects, which control for any time-varying changes in bank characteristics or lending policies. Even after accounting for these factors, target-bank borrowers still face a 15.3 percentage point higher probability of relationship termination compared to acquirer-bank borrowers. This suggests that the organizational friction channel, rather than changes in general bank policies or market conditions, drives the observed disruption in lending relationships.

These findings provide strong empirical evidence that bank mergers significantly disrupt existing lending relationships, with particularly severe consequences for borrowers of target banks. The results suggest that policymakers and regulators should carefully consider these relationship disruption costs when evaluating the overall impact of bank mergers on credit allocation efficiency.

2.4. Cross-Sectional Heterogeneity

2.4.1 Soft Information Intensity in Lending Relationships

We construct our measure of soft information intensity following Agarwal and Ben-David (2018). Specifically, we classify a lending relationship as high soft information (HighSoftInfo) if it ranks in the top 25% of our sample based on the unexplained component of loan pricing - the portion of loan spreads that cannot be explained by observable hard information factors like firm size, leverage, profitability, and credit ratings. Table 7 represents the regression of loan spreads on observable hard information factors. The residuals from this regression capture the component of loan pricing explained by soft information.

[Insert Table 4 Here]

Table 4 examines how merger effects vary with soft information intensity using our most comprehensive specification with both firm-by-year and bank-by-year fixed effects. The results show that high soft information amplifies the negative effects of bank mergers on relationship continuation. For acquiring banks, the interaction term Acquire × HighSoftInfo indicates an additional 2.4 percentage point reduction in relationship continuation probability for high soft information borrowers. The effect is even stronger for target banks, where Target × HighSoftInfo shows an additional 4.4 percentage point reduction. These interaction effects are statistically significant and economically meaningful relative to the baseline merger effects.

2.4.2 Geographic Distance and Information Production

Table 5 provides complementary evidence using geographical distance between borrowers and lenders. This approach builds on seminal work by Degryse and Ongena (2005), who show that geographical proximity facilitates information collection and monitoring, and Berger et al. (2005), who demonstrate that larger banks face greater difficulties in processing and acting on soft information from distant borrowers.

[Insert Table 5 Here]

The results strongly support the soft information channel highlighted by the theoretical framework of Stein (2002) on organizational hierarchy and information processing. Following Degryse and Ongena (2005), we construct Reversed Lender Distance as the negative of the natural logarithm of the physical distance (in kilometers) between the borrower's headquarters and the lending bank's location. This transformation ensures that higher values indicate closer proximity, facilitating interpretation. The interaction Target × Reversed Lender Distance shows a significant negative coefficient of -0.024, indicating that target-bank borrowers

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located closer to their lenders face larger disruptions in lending relationships. To interpret the economic magnitude, for a target bank, a decrease in distance from 400km to 100km (an increase in Reversed Lender Distance by 1.39) is associated with an additional 3.3 percentage point reduction in relationship continuation probability (-0.024 × 1.39 = -0.033). Similarly, Acquire × Reversed Lender Distance shows a negative coefficient of -0.010, suggesting that for acquiring banks, the same decrease in distance corresponds to an additional 1.4 percentage point reduction in continuation probability.

Also, we find that when borrowers face an increase in distance to their lender post-merger (Change in Lender Distance), the probability of relationship continuation actually increases by 17.3 percentage points, which suggests that lending relationships that survive mergers tend to be those where the borrower-lender distance increases. Rather than showing that increased distance is beneficial, this result likely reflects a selection effect: the types of lending relationships that can withstand increased distance are fundamentally different. This result aligns with Berger and Udell (2002)'s argument that relationships based primarily on hard information are more resilient to organizational changes since such information can be more easily transmitted within hierarchical structures.

The consistency between our soft information intensity and distance-based results provides strong support for the information-based mechanism of merger disruption. Both approaches indicate that bank mergers most severely impact relationships that rely heavily on soft information processing, validating theories suggesting that organizational changes create particular frictions in maintaining relationship-specific information.

Together, these empirical strategies provide a rigorous framework for evaluating how mergers disrupt lending relationships and affect borrower outcomes. The granular nature of the dataset and the inclusion of non-merging banks as controls ensure the validity of the causal inferences drawn from the analysis.

3. The Real Effects of Lending Relationship Disruptions

3.1. Lending Relationship Disruptions Induced by Bank Mergers: A Credit Supply Shock

As documented in the previous section, bank mergers generate plausibly exogenous credit supply shocks to borrowers with pre-merger relationships, particularly those of target banks, when their existing loans mature and require renegotiation or refinancing. Because merger decisions are determined by the consolidating institutions rather than their borrowers, these events provide a quasi-natural experiment for identifying the causal effects of relationship lending disruptions. Our identification strategy exploits not only the merger events themselves, but specifically the timing of loan maturity dates that trigger borrowers' exposure to credit supply shocks.

The credit supply shock manifests when affected firms must refinance or renegotiate their pre-merger loans with the consolidated entity. This timing is crucial for identification because it creates variation in when different borrowers experience the shock, even within the same merger event. The shock stems from two key theoretical mechanisms. First, relationship lending relies heavily on accumulated soft information that does not transfer seamlessly during mergers (Berger and Udell, 2002; Stein, 2002). Target banks develop borrower-specific insights through repeated interactions, but this proprietary information is often lost or diminished when loan renewal decisions are made by the merged institution. Second, consolidated banks frequently transition toward more standardized lending practices that emphasize hard information, making them less likely to accommodate relationship-dependent borrowers during refinancing negotiations.

When pre-merger loans mature, affected firms may face significant frictions in securing alternative financing. Prospective new lenders face acute adverse selection problems when evaluating borrowers whose relationship capital has been destroyed (Sharpe, 1990; Dell'Ariccia and Marquez, 2004). Without access to the soft information accumulated by

target banks over multiple loan cycles, outside lenders must rely more heavily on hard information, leading to higher interest rates, stricter collateral requirements, or outright credit rationing.

Firms attempting to substitute equity for relationship-based debt may face heightened information asymmetries in capital markets. Relationship-dependent borrowers are typically less visible to outside investors and lack access to public equity markets (Myers and Majluf, 1984). Moreover, attempts to raise equity following a credit supply shock may signal financial distress, triggering adverse selection discounts or deterring investor participation entirely.

The credit supply shock from merger-induced relationship disruptions should manifest in firms' real outcomes through two primary channels. First, when firms cannot fully substitute their lost relationship credit with alternative financing, they likely face binding financial constraints that impair their ability to maintain planned investment. These investment distortions may be particularly acute because relationship-dependent firms often require financing for informationally opaque investments where the project quality is difficult to credibly convey to new, arms-length lenders Myers and Majluf (1984). Consequently, we predict that target banks' pre-merger borrowers will exhibit lower investment rates after their existing loans mature.

Second, firms experiencing relationship disruptions may be forced to reduce employment to preserve financial flexibility when facing credit supply shocks. This prediction stems from two mechanisms: (1) the direct effect of reduced access to working capital financing that previously supported payroll obligations, and (2) the strategic decision to build financial slack by reducing labor costs when relationship-based credit lines are no longer reliably available to smooth temporary cash flow shortfalls (Chodorow-Reich, 2014; Karolyi, 2018).

3.2. Data

To examine the real effects of lending relationship disruptions, we construct a comprehensive panel dataset tracking firm outcomes around bank merger events. Our firm outcomes dataset

follows each firm-bank relationship from the initiation of the first facility between the firm and lender through 2018. By integrating bank merger data with the Dealscan-Compustat Link database (Chava and Roberts, 2008) and firm-level information from Compustat, we create a dataset spanning 1982-2018 that encompasses 256,063 firm-bank-year observations. The initial sample comprises 24,267 firm-bank relationships involving 11,952 unique firms and 699 banks. To ensure clean identification of merger effects, we impose two critical sampling restrictions. First, we exclude firm-bank relationships where the lender participated in multiple merger events during the period from the first facility year through 2018. This restriction helps isolate the impact of individual merger events and reduces the sample to 69,086 observations. Second, we require non-missing data for key firm-level control variables necessary for our empirical analysis. After applying these filters, our final estimation sample contains 66,281 firm-bank-year observations representing 5,272 unique firms and 410 unique banks.

We construct four primary outcome variables to capture the real effects of relationship disruptions on firm behavior. First, we measure firms' access to alternative financing sources using Other Lender Exist, an indicator variable equal to 1 if the firm maintains lending relationships with banks other than those involved in merger events. This variable helps us assess whether firms can substitute disrupted relationships with alternative credit sources. Second, we examine firms' investment behavior using Investment/Total Assets, which captures total investment including acquisitions scaled by total assets. This comprehensive measure allows us to evaluate how relationship disruptions affect firms' overall investment policies. Third, we measure equity issuance activity through the ratio of common and preferred stock sales to total assets, providing insight into firms' use of alternative financing channels when lending relationships are disrupted. Finally, we construct Layoff, an indicator variable equal to 1 if the firm reduces employment by at least 1% in a given year, to capture the real effects of relationship disruptions on employment decisions. This conservative threshold for employment reductions helps identify meaningful adjustments to firms' labor forces while avoiding

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noise from regular employee turnover. The granularity of our dataset allows us to track these outcomes before and after credit supply shocks induced by bank mergers while controlling for time-varying firm characteristics. This rich panel structure, combined with our empirical strategy exploiting variation in borrower exposure to merger partners, enables us to identify the causal effects of relationship disruptions on firm behavior.

3.3. Empirical Specification and Results

3.3.1 Empirical Specification

To identify the causal effects of lending relationship disruptions on firm outcomes, we implement a generalized difference-in-differences framework leveraging the staggered timing of bank mergers. The regression model is specified as follows:

$$\text{Firm Outcome}_{c,t} = \beta_1 \, \text{Post\_Acquire\_Supply\_Shock}_{c,b,t} + \beta_2 \, \text{Post\_Target\_Supply\_Shock}_{c,b,t}$$
$$+ \, \alpha_c + \alpha_{b,t} + \alpha_t + \mathbf{X}_{c,t}\boldsymbol{\beta} + \epsilon_{c,b,t}$$

where:

- Firm Outcome$_{c,t}$ represents one of four outcome variables for firm c in year t: (1) probability of obtaining loans from non-relationship lenders ($OtherLender_{c,t}$), (2) sale of common and preferred stock scaled by total assets ($EquityIssuance_{c,t}$), (3) investment scaled by total assets ($Investment/At_{c,t}$), or (4) probability of reducing employment by more than 1% ($Layoff_{c,t}$).

- Post_Acquire_Supply_Shock$_{c,b,t}$ equals 1 beginning in year t when firm c's relationship lender b acquires another bank, capturing the supply shock from acquirer-bank mergers.

- Post_Target_Supply_Shock$_{c,b,t}$ equals 1 beginning in year t when firm c's relationship lender b is acquired by another bank, capturing the supply shock from target-bank

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mergers.

- α_c denotes firm fixed effects for firm c, absorbing all time-invariant firm characteristics.

- $\alpha_{b,t}$ represents bank-year fixed effects for bank b in year t, controlling for time-varying bank characteristics.

- α_t indicates year fixed effects for year t, capturing aggregate time trends.

- $\mathbf{X}_{c,t}$ is a vector of time-varying controls for firm c in year t including firm size and leverage.

- $\epsilon_{c,b,t}$ is the error term for firm c, bank b, and year t, with standard errors clustered by borrower and year.

The lending relationship disruptions induced by bank mergers are captured through two supply shock measures: Post Acquire Supply Shock$_{c,b,t}$, which applies to firms borrowing from acquiring banks, and Post Target Supply Shock$_{c,b,t}$, which applies to firms borrowing from target banks. These indicators are set to one starting in the merger year for firms without outstanding loans or from the maturity year of the last pre-merger loan for firms with existing facilities. This approach ensures that the supply shock aligns with the timing of the firm's actual exposure to credit disruptions.

Furthermore, the staggered nature of merger events, combined with comprehensive fixed effects and controls, strengthens the identification of causal impacts on firm-level outcomes.

3.3.2 Alternative Financing and Real Effects

Having established that bank mergers significantly disrupt lending relationships, particularly for target-bank borrowers, we now examine the real effects of mergers. Table 6 presents our findings on the real effects across four dimensions.

[Insert Table 6 Here]

First, we examine firms' ability to substitute relationship lending with alternative financing sources. Column 1 shows that target-bank borrowers experience a 46.6 percentage point reduction in the probability of obtaining loans from other lenders compared to non-merging bank borrowers, while acquirer-bank borrowers face a more modest 15.6 percentage point decline. This stark difference aligns with Berger et al. (2005)'s argument that organizational disruption particularly impairs target banks' ability to maintain relationships and transmit borrower information to potential new lenders.

These financing frictions force firms to adjust their financing policies. Column 2 shows that target-bank borrowers cut equity issuance ($EquityIssuance_{c,t}$) by 2.66 percentage points of total assets, while acquirer-bank borrowers reduce it by 0.99 percentage points. This suggests that relationship disruptions not only affect debt financing but also spill over to equity markets, consistent with Bharath et al. (2007)'s evidence on the complementarity between relationship lending and access to public markets.

The financing constraints translate into real investment effects. Column 3 shows that target-bank borrowers reduce investment ($Investment/At_{c,t}$) by 1.39 percentage points. Given that Chava and Roberts (2008) document an average corporate investment rate of around 8%, our estimated effect represents a substantial 17% decline from the mean. In contrast, acquirer-bank borrowers show no significant change in investment, consistent with their better ability to maintain access to credit.

Perhaps most concerning from a social welfare perspective, Column 4 reveals that financing disruptions affect employment decisions. Target-bank borrowers increase their probability of significant workforce reductions ($Layoff_{c,t}$) by 10.6 percentage points. This finding extends Garmaise and Moskowitz (2006)'s work on the real effects of banking market competition by showing that organizational disruption from mergers can independently drive employment effects. Notably, we find no significant employment effect for acquirer-bank borrowers, again highlighting the asymmetric impact of merger-induced disruptions.

These results provide strong evidence that merger-induced disruptions to lending rela-

tionships have significant real effects, particularly for target-bank borrowers. The findings suggest that regulators should carefully weigh these transitional costs when evaluating bank mergers, especially given the differential impact on target versus acquiring banks.

4. Concuding Remarks

This paper provides comprehensive empirical evidence on the transmission of organizational frictions to real economic outcomes through the relationship lending channel. Exploiting the staggered timing of bank mergers within a quasi-experimental research design, we document economically meaningful heterogeneity in how merger-induced disruptions affect borrowers based on their pre-merger relationship status and reliance on relationship-specific information.

Our empirical analysis yields three principal findings that illuminate the role of organizational structure in financial intermediation. First, we establish substantial asymmetry in relationship continuation probabilities following bank mergers: target-bank borrowers experience a 23.9 percentage point reduction in relationship maintenance probability compared to a 6.1 percentage point decline for acquirer-bank borrowers. This differential persists after implementing high-dimensional fixed effects to account for time-varying firm and bank characteristics, suggesting that organizational integration particularly impedes target banks' relationship lending capabilities. Second, employing a generalized differences-in-differences framework, we find that affected borrowers face significant frictions in securing alternative financing when pre-merger loans mature. Target-bank borrowers exhibit a 33.2 percentage point lower probability of obtaining credit from other lenders relative to acquirer-bank borrowers, consistent with theoretical predictions regarding the relationship-specific nature of soft information. Third, these financing frictions translate into substantial real effects: target-bank borrowers reduce investment by 2.96 percentage points and increase their probability of workforce reductions by 11.1 percentage points relative to borrowers of non-merging banks. The economic magnitude of these effects is considerable - the differential impact on

investment between target and acquirer banks' borrowers alone accounts for approximately $116.76 billion during our sample period.

Our analysis carries important implications for banking policy amid continued industry consolidation. While prior literature documents efficiency gains from bank mergers through economies of scale, our results suggest these benefits should be weighed against significant costs imposed through the disruption of relationship lending. The asymmetric effects we identify - falling disproportionately on firms relying more heavily on soft information - demonstrate how organizational complexity can impede relationship-based lending and propagate to the real economy. These findings are particularly salient as regulators evaluate proposed mergers and consider reforms to merger oversight in response to recent banking sector stress.

Several promising avenues for future research emerge from our analysis. While we document the immediate transmission of organizational friction to real outcomes, longer-horizon studies could examine the dynamic adjustment process as firms attempt to establish new relationship banking arrangements. Additionally, research could explore how technological innovation in lending may alter the relative importance of hard versus soft information, potentially changing the nature and consequences of relationship disruptions. Finally, our findings suggest the need for theoretical work modeling how various policy interventions might help preserve valuable banking relationships during periods of industry consolidation.

Our analysis ultimately demonstrates that organizational design has first-order implications for financial intermediation that extend beyond the boundaries of merging institutions to affect borrower firms' real economic decisions. These results advance our understanding of the mechanisms through which banking sector consolidation influences credit allocation and real activity.

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Appendix A. Variables

Loan:

- *Continue* = Indicator variable equal to one if the borrower has facilities with the same lender or the acquirer of this lender in 6 years; 0 otherwise.

- *Acquire* = Indicator variable equal to one if the lender acquired any other banks before the next facility with the borrower or within a maximum of 6 years; 0 otherwise.

- *Target* = Indicator variable equal to one if the lender is acquired by any other banks before the next facility with the borrower or within a maximum of 6 years; 0 otherwise.

- *Loan Size* = Ln(Facility amount in $US).

- *Loan Price (bps)* = All-in-drawn spread over LIBOR (i.e., interest spread on drawn funds).

- *Secured* = Indicator variable equal to one if the facility is secured, and 0 otherwise.

- *Soft Information* = The residual in the regression of loan price on hard information used in loan pricing (details of the calculation are provided in Appendix C).

- *HighSoftInfo* = An indicator variable equal to 1 for facilities in which the absolute value of soft information ranked 25% in my sample and 0 otherwise.

- *Function of SoftInfo* = A category variable equal to 1 if the Soft Information of the facility is positive, equal to -1 if the Soft Information of the facility is negative, and equal to 0 if the Soft Information is 0.

- *Length (years)* = Years since the borrowing firm's first loan initiated by the bank to the current facility.

- *Reversed Lender Distance* = The log-transformed reversed distance between the borrower and the lender for the facility.

- *Change in Lender Distance* = An indicator variable equal to 1 if the distance between the borrower and the lender of the next facility (e.g., the acquirer of the current lender) is larger than the distance between the borrower and the current lender, and 0 otherwise.

- *Loan Type Dummies* = Indicator variables corresponding to loan types reported in Dealscan, such as term loan, revolver, 364-day facility, and acquisition facility.

- *Loan Distribution Method Dummies* = Indicator variables corresponding to loan distribution methods reported in Dealscan, such as syndication, sole lender, public underwriting, and private placement.

- *Loan Seniority Dummies* = Indicator variables corresponding to loan seniority reported in Dealscan, such as Senior, Subordinated, Junior Subordinated, Senior Subordinated, and Mezzanine.

Firm:

- *Other Lender Exist* = An indicator variable equal to 1 if the firm holding loans from lenders other than its relationship lender that is exposed to merger partners; 0 otherwise.

- *Investments/Total Assets* = The firm's investments (including acquisitions)/Total Assets.

- *Equity Issuance* = Sale of Common and Preferred Stock/Total Assets.

- *Layoff* = Indicator variable equal to one if the firm reduces employment by at least 1% in a particular year, and zero otherwise.

- *Firm Size* = Ln (The firm's total assets).

- *Leverage* = (Long-term Debt + Current Debt)/Total Assets.

- *Net Income/Total Assets* = Net Income/Total Assets.

- *Gross Profit Margin* = Gross Profit/Revenue.

- *Tangibility* = Property, Plant, and Equipment/Total Assets.

- *Debt to Equity* = (Long-term Debt + Current Debt)/Total Equity.

- *Book/Market* = Book Equity/Market Capitalization.

- *Bond Rate Dummy* = Indicator variable equal to one if the firm has a bond rating, and zero otherwise.

- *Asset Turnover* = Net sales/Total Assets.

- *Post Acquire Supply Shock* = Indicator variable equal to one beginning in the year t in which the supply shock due to the lender involved in a merge event as an acquirer bank, and zero otherwise. (For each firm-lender relationship, the supply shock is defined as beginning either (i) at the time the lender completes the acquisition if the loan matures before the merger event, or (ii) at the loan's maturity if it occurs after the merger event).

- *Post Target Supply Shock* = Indicator variable equal to one beginning in the year t in which the supply shock due to the lender involved in a merge event as a target bank, and zero otherwise. (For each firm-lender relationship, the supply shock resulting from the lender being acquired begins either (i) at the time the lender is acquired by another bank if the loan matures before the merger event, or (ii) at the loan's maturity if it occurs after the merger event).

Appendix B. Tables

Table 1: Merged Banks and Affected Borrowers

Our sample spans from 1988 to 2015, a period characterized by transformative changes in the U.S. banking sector across five distinct regulatory regimes. The first period (1988-1993) represents the pre-interstate banking era, during which the McFadden Act restrictions were still binding and consolidation patterns were predominantly intrastate. The second period (1994-1999) marks the implementation of the Riegle-Neal Interstate Banking and Branching Efficiency Act, which fundamentally altered the geographic scope of banking operations by removing interstate barriers. The third period (2000-2007) corresponds to the universal banking era, initiated by the Gramm-Leach-Bliley Act, which enabled the integration of commercial banking, investment banking, and insurance activities within single institutions. The fourth period (2008-2013) encompasses the financial crisis and subsequent regulatory reform, including the implementation of the Dodd-Frank Act and enhanced prudential standards. The final period (2014-2015) reflects the post-crisis evolution, characterized by regulatory recalibration and efficiency-focused consolidation.

Year	Number of Bank Mergers	Total Affected Pre-Merger Borrowers	Affected Acquirer Bank Borrowers	Affected Target Bank Borrowers	Non-affected Borrowers
1988	230	240	230	23	537
1989	100	574	528	55	1,120
1990	166	918	900	22	1,557
1991	189	1,547	1,489	76	1,741
1992	161	1,820	1,346	565	2,154
1993	218	2,243	2,204	48	2,705
1994	193	1,393	1,325	108	4,154
1995	246	1,928	1,834	172	4,346
1996	228	4,984	4,769	298	2,407
1997	278	3,838	3,464	631	4,733
1998	249	6,647	6,593	316	3,317
1999	116	5,445	5,392	66	4,818
2000	196	5,370	5,061	451	5,435
2001	126	8,078	7,580	741	3,369
2002	101	2,993	2,855	169	8,276
2003	68	6,302	6,210	106	4,991
2004	83	7,209	6,615	880	3,152
2005	80	6,779	6,739	472	3,384
2006	63	7,452	7,310	172	3,105
2007	74	4,900	4,874	43	5,087
2008	77	7,904	7,877	55	2,470
2009	60	6,322	6,301	259	3,727
2010	69	6,464	5,696	1,236	3,127
2011	51	6,458	6,446	18	2,872
2012	30	4,241	4,240	2	4,655
2013	20	2,314	2,311	3	6,120
2014	32	1,725	1,714	11	6,640
2015	17	857	856	1	7,588

Table 2: Sample Selection and Summary Statistics

Panel A. Sample Selection

Sample Construction Step	Firms	Banks	Loans				
Dealscan Facility Data	80,014		312,498				
Matched with U.S. Bank Mergers from S&P Global	29,282	1,000	98,843				
Nonmissing Controls within Sample Period(88-15)	13,058	828	43,175				

Panel B. Summary Statistics

	Mean	SD	10%	25%	50%	75%	90%
Loan (43,175)							
Price (bps)	212.43	132.31	50.00	112.50	200.00	300.00	387.50
Size ($M)	318.90	594.07	10.00	32.00	100.00	300.00	800.00
Secured (0/1)	0.75	0.43	0.00	0.00	1.00	1.00	1.00
364-Day Facility	6.00%						
Acquisition Facility	0.22%						
Revolving Facility	67.17%						
Term Loan	38.90%						
Bridge Loan	1.53%						
Borrowers (13,058)							
Total Assets ($M)	11,539.35	31,350.50	60.11	250.67	1,174.75	5,682.56	24,820.57
Profitability	0.10	0.13	0.02	0.07	0.11	0.16	0.22
Tangibility	0.32	0.26	0.03	0.10	0.25	0.50	0.73
Market Value/Book Value	2.56	3.63	0.61	1.14	1.84	3.07	5.28
Leverage	0.35	0.24	0.05	0.17	0.32	0.48	0.65
Rated(0/1)	0.48	0.50	0.00	0.00	0.00	1.00	1.00
Asset Turnover	0.97	0.82	0.14	0.36	0.79	1.33	2.01

Table 3: Bank Mergers and Lending Relationships

This table reports the results of fixed-effects linear probability model (LPM) regressions analyzing $Pr(\text{Continue}_{i,c,b,t})$, a binary variable equal to 1 if borrower c initiates at least one additional loan with lender b, or with the acquirer of lender b, within six years of the start date t of loan i, and 0 otherwise. The key independent variables are $\text{Acquire}_{i,c,b,t}$, a binary variable equal to 1 if lender b acquires another bank prior to borrower c's next loan within the six-year period following loan i's start date t, and 0 otherwise, and $\text{Target}_{i,c,b,t}$, a binary variable equal to 1 if lender b is acquired by another bank prior to borrower c's next loan within the same six-year period, and 0 otherwise. To account for borrower-specific and lender-specific variation over time, the regressions include firm-by-year fixed effects ($\alpha_{c,t}$) to control for time-varying firm-specific trends in borrowing behavior and unobservable characteristics affecting lending relationships, as well as bank-by-year fixed effects ($\alpha_{b,t}$) to capture bank-specific time trends, including shocks or changes specific to lender b in a given year. The model also controls for loan-specific characteristics, including the natural logarithm of the loan amount ($\ln(\text{Loan Size}_{i,c,b,t})$), loan spread in basis points over LIBOR or an equivalent benchmark ($\text{Loan Price}_{i,c,b,t}$), an indicator for whether the loan is secured ($\text{Secured}_{i,c,b,t}$), and categorical variables for loan type, loan seniority, and loan distribution method. Standard errors, clustered by borrower (c) and year (t), are robust to heteroskedasticity and further adjusted for multi-way clustering using the Cameron et al. (2011) correction. Statistical significance is denoted by ***, **, and * for the 1%, 5%, and 10% levels, respectively.

	$Pr(Continue_{i,c,b,t})$		
	(1)	(2)	(3)
Acquire	-0.061***	-0.464***	-0.300***
	(0.004)	(0.026)	(0.036)
Target	-0.239***	-0.640***	-0.453***
	(0.007)	(0.036)	(0.060)
Loan Controls	YES	YES	YES
Firm × Year FE	NO	YES	YES
Bank × Year FE	NO	NO	YES
Observations	59735	58548	43698
R-squared	0.08	0.32	0.88

Table 4: Bank Mergers and Lending Relationships - Soft Information

This table presents the results of fixed-effects LPM regressions of $Pr(Continue_{i,c,b,t})$, an indicator equal to 1 if the borrower c has initiated at least another loan with the lender b or the acquirer of this lender within six years of the loan i's start date t, and 0 otherwise, on $Acquire_{i,c,b,t}$, an indicator variable equal to 1 if the lender b acquired any other banks before the next loan with the borrower c in 6 years and 0 otherwise, $Target_{i,c,b,t}$, an indicator variable equal to 1 if the lender b has been acquired by any other banks before the next loan with the borrower c in 6 years and 0 otherwise, and $HighSoftInfo$, an indicator variable equal to 1 for lending relationship in which the use of soft information ranked 25% in my sample and 0 otherwise, and the interaction of these variables. I include bank fixed effects to isolate variation in the likelihood of obtaining loans that varies across borrowers for the same lender. Moreover, I include firm $\times$ year fixed effects to control for firm-specific time trends in lending relationships. Controls include loan size, loan price (bps), Secured (0/1), loan type dummies, loan seniority dummies, and loan distribution method dummies. SoftInfo controls including the function of the soft information and its interactions with $Acquire_{i,c,b,t}$, $Target_{i,c,b,t}$, and $HighSoftInfo$. Standard errors, reported in parentheses, are clustered by borrower and by year, robust to heteroskedasticity, and adjusted using the Cameron et al. (2011) correction. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

| | $Pr(Continue_{i,c,b,t})$ | | |
	(1)	(2)	(3)
Acquire	-0.103***	-0.390***	-0.239***
	(0.033)	(0.025)	(0.029)
Target	-0.286***	-0.659***	-0.461***
	(0.030)	(0.041)	(0.080)
$HighSoftInfo$	0.019	-0.005	0.021*
	(0.019)	(0.016)	(0.011)
Acquire $\times$ $HighSoftInfo$	-0.058**	-0.037*	-0.024*
	(0.025)	(0.021)	(0.014)
Target $\times$ $HighSoftInfo$	0.013	0.010	-0.044**
	(0.030)	(0.027)	(0.018)
SoftInfo Controls	YES	YES	YES
Loan Controls	YES	YES	YES
Firm $\times$ Year FE	NO	YES	YES
Bank $\times$ Year FE	NO	NO	YES
Observations	26921	26041	18373
R-squared	0.12	0.34	0.87

Table 5: Bank Mergers and Lending Relationships - Distance

This table presents the results of fixed-effects LPM regressions of $Pr(Continue_{i,c,b,t})$, an indicator equal to 1 if the borrower c has initiated at least another loan with the lender b or the acquirer of this lender within six years of the loan i's start date t, and 0 otherwise, on $Acquire_{i,c,b,t}$, an indicator variable equal to 1 if the lender b acquired any other banks before the next loan with the borrower c in 6 years and 0 otherwise, $Target_{i,c,b,t}$, an indicator variable equal to 1 if the lender b has been acquired by any other banks before the next loan with the borrower c in 6 years and 0 otherwise, and $ReversedLenderDistance_{i,c,b,t}$, the log transformed reversed distance between the borrower c and the lender b of the loan i, and the interaction of these variables, and $ChangeinLenderDistance_{i,c,b,t}$, a dummy variable equal to 1 if the sequential loan of the borrower c is issued by a bank acquired the bank b with larger distance to the borrower c and 0 otherwise. I include bank fixed effects to isolate variation in the likelihood of obtaining loans that varies across borrowers for the same lender. Moreover, I include firm × year fixed effects to control for firm-specific time trends in lending relationships. Controls include loan size, loan price (bps), Secured (0/1), loan type dummies, loan seniority dummies, and loan distribution method dummies. Standard errors, reported in parentheses, are clustered by borrower and by year, robust to heteroskedasticity, and adjusted using the Cameron et al. (2011) correction. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	$Pr(Continue_{i,c,b,t})$		
	(1)	(2)	(3)
Acquire	-0.195***	-0.449***	-0.376***
	(0.038)	(0.025)	(0.050)
Target	-0.583***	-0.766***	-0.639***
	(0.041)	(0.050)	(0.101)
$ReversedLenderDistance$	0.018***	0.007***	0.005*
	(0.005)	(0.002)	(0.003)
Acquire × $ReversedLenderDistance$	-0.018**	0.001	-0.010*
	(0.007)	(0.003)	(0.006)
Target × $ReversedLenderDistance$	-0.033***	-0.018***	-0.024**
	(0.006)	(0.005)	(0.010)
$ChangeinLenderDistance$	0.242***	0.088***	0.173***
	(0.022)	(0.022)	(0.033)
Loan Controls	YES	YES	YES
Firm × Year FE	NO	YES	YES
Bank × Year FE	NO	NO	YES
Observations	49825	48835	35420
R-squared	0.09	0.32	0.89

Table 6: Real Effects of Credit Supply Shocks Induced by Bank Mergers

This table presents fixed effects regression estimates of firm outcomes including $Pr(Other\_Lenders = 1)_{c,t}$, which are the firm c's likelihood of obtaining loans from lenders other than its relationship lender that is exposed to merger partners at year t, and $Equity\_issuance_{c,t}$, which is the firm c's sale of common and preferred stock scaled by its total assets at year t, and $Investment/At_{c,t}$, which are the firm c's *investment* divided by the *total assets* in year t, and $Pr(Layoff = 1)_{c,t}$, the firm c's likelihood of laying off employees by more than 1% at year t, respectively, on $Post\_Acquire\_Supply\_Shock_{c,b,t}$, an indicator variable equal to 1 beginning in the year t in which there is a supply shock for firm c due to the relationship lender b acquired another bank and 0 otherwise, and $Post\_Target\_Supply\_Shock_{c,b,t}$, an indicator variable equal to 1 beginning in the year t in which there is a supply shock for firm c due to the relationship lender b is acquired by another bank and 0 otherwise. Controls denoted as $X_{i,t}$ include firm size and leverage. Standard errors, reported in parentheses, are clustered by borrower and by year, robust to heteroskedasticity, and adjusted using the Cameron et al. (2011) correction. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	$OtherLender$	$EquityIssuance$	$Investments/At$	$Layoff$
	(1)	(2)	(3)	(4)
Acquire Supply Shock	-0.156**	-0.991***	-0.222	0.014
	(0.059)	(0.192)	(0.213)	(0.027)
Target Supply Shock	-0.466***	-2.658***	-1.389***	0.106***
	(0.017)	(0.399)	(0.215)	(0.021)
Firm Size	0.025***	0.769***	-0.972***	-0.051***
	(0.006)	(0.173)	(0.132)	(0.006)
Leverage	0.001***	0.021***	-0.054***	0.002***
	(0.000)	(0.005)	(0.006)	(0.000)
Firm Controls	YES	YES	YES	YES
Bank-Year FE	YES	YES	YES	YES
Firm FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Observations	66294	62066	64075	61317
R-squared	0.57	0.47	0.39	0.25

Appendix C. Soft Information Estimation

Table 7: Soft Information Estimation

This table presents the regression of loan spreads on observable hard information factors. The residuals from this regression capture the component of loan pricing explained by soft information. Controls include loan type dummies and bank fixed effects. Standard errors (in parentheses). ***, **, and * denote significance at 1%, 5%, and 10% levels.

	(1)
Ln (Asset)	-9.021***
	(0.353)
Net Income/Total Assets	-100.375***
	(3.536)
Gross Profit Margin	-5.506***
	(1.774)
Tangibility	-17.813***
	(1.628)
Leverage (Debt to Assets)	98.878***
	(2.320)
Debt to Equity	0.831**
	(0.111)
Book/Market	30.167***
	(0.772)
Loan Size	-17.363***
	(0.361)
Bond Rate Dummy	0.138
	(1.006)
Asset Turnover	-1.607***
	(0.573)
Loan Type Dummies	YES
Bank FE	YES
Specification	OLS
Observations	73,047
R-squared	0.49