Labor Markets and Financial Risk

How Bankers' Outside Options Amplify Credit Cycles*

Valentin Kecht† Georg Schneider‡

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Abstract

Theory predicts that labor market conditions affect agency problems in employment relationships, but the empirical evidence supporting this link remains limited. This paper provides causal evidence on how banker labor mobility impacts risk-taking in the financial industry. Using LinkedIn profile data, we construct a bank-level measure of outside options, capturing labor demand shocks in other financial institutions. We find that a one standard deviation improvement in outside options corresponds to a 3.3% reduction in the share of investment-grade loans and a 7% increase in lending volume. Banks exposed to positive outside option shocks also exhibit increased financial risk and significantly larger contributions to systemic risk. These results are consistent with the idea that enhanced outside options weaken the capacity of performance-based compensation to discipline loan managers. Our findings suggest a labor mobility channel in the amplification of credit cycles and highlight the role of labor markets for financial stability.

Keywords: Moral Hazard, Financial Stability, Risk, Labor Markets, Outside Options

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†University of Bonn. kecht@uni-bonn.de

‡University of Bonn. georg.schneider@uni-bonn.de

1 Introduction

Outside options influence bargaining outcomes (Binmore et al., 1986). In labor markets, better outside options enhance employee bargaining power, leading to increased job mobility and higher wages (Caldwell and Harmon, 2019a; Caldwell and Danieli, 2020; Johnson et al., 2023). However, the influence of labor market outside options on workers' on-the-job choices beyond traditional bargaining contexts is less well-understood. This relationship is particularly important in situations characterized by agency problems, when workers have more information than supervisors and optimal actions are difficult to enforce. This raises an important question: Do labor market outside options interact with agency problems to affect firm-level and aggregate economic outcomes?

We investigate the link between outside options and employee choices in the context of the financial industry, which represents an ideal setting for two reasons. First, labor mobility — especially job-to-job mobility — in the financial sector is high, giving rise to variation in labor market outside options of employed workers (Azzopardi et al., 2020). Second, workers make complex and risky choices on behalf of their firms, which have limited monitoring capacity to ensure these decisions are in line with firm objectives. Hence, the alignment of worker and firm interests is key in driving firm performance and, more broadly, in ensuring efficient financial intermediation.

This paper presents empirical evidence that bankers with better labor market outside options make riskier lending decisions. We argue that an agency cost channel is driving these results. Specifically, improved outside options reduce the alignment of interests of workers and firms, undercutting the disciplinary role of performance-based compensation. Since this mechanism is pro-cyclical, we present a novel channel through which labor market dynamics can amplify credit cycles.

The key empirical challenge is to identify shocks to outside options that are exogenous to contemporaneous bank-level dynamics. For instance, using current outflows to other

banks as a proxy for outside options may capture relevant variation in workers' employment opportunities. This strategy, however, is susceptible to negative bank-level shocks increasing worker outflows while deteriorating credit supply, introducing a spurious negative correlation between outflows and risky lending. To address this issue, we construct a measure of outside options that is orthogonal to contemporaneous firm dynamics. We use individual employment biographies of senior US investment bankers to create a network-based measure, capturing labor demand at other banks. This approach builds on the idea that information about hiring dynamics is transmitted through coworker networks. By exploiting variation in the strength of ties between banks, we are able to measure the differential exposure of workers across banks to sectoral labor demand at other institutions. We show that our measure of outside options is neither driven by past employee outflows nor by other contemporaneous or past bank-level observables. Consistent with prior findings in the literature, the measure predicts both worker transitions to other firms and wage gains for workers remaining at the firm.

In our main empirical analysis, we explore the relationship between banker outside options and their lending decisions using detailed transaction-level data on syndicated loans. Focusing on the likelihood that a borrower firm is rated as investment-grade, our results indicate that a one standard deviation improvement in outside options corresponds to a 3.3% reduction in the share of investment-grade loans. In line with a moral hazard channel driving the results, the negative effect is fully offset by banks raising performance incentives. We also estimate the effect of outside options on bank-level lending volume and find a 7% increase in overall lending volume. Finally, we investigate whether outside options affect the financial stability of lenders and of the financial system as a whole using lender- and financial system-level measures of risk (Adrian and Brunnermeier, 2016). We find that a standard deviation outside options shock increases the growth of both lender and systemic risk by 4%.

These results can be explained in a simple framework where one bank's hiring decision generates an externality in the form of exacerbated agency problems at other banks. As bankers need to exert effort in screening potential borrowers, the ability to find employment elsewhere undercuts the disciplining effect of termination conditional on loan default. To counter the negative effect of improved outside options, banks can raise performance incentives and re-align the interests of bankers.

Our main contribution is to provide empirical evidence that labor market dynamics amplify credit cycles via bankers' outside options. With this result, we add to three strands of literature. First, a small theoretical literature has studied potential interactions between agency problems within banks, labor market dynamics in the financial sector, and the quality and quantity of credit (Myerson, 2012, 2014; Thanassoulis, 2012; Axelson and Bond, 2015; Boxtel, 2017). These papers analyze different channels through which the banker labor markets can impact credit supply, including frictions in the supply of bankers, externalities generated by competition for talent, and bankers' job opportunities in the real economy. We contribute to this literature by providing empirical evidence for this interaction in general and for the externality channel in particular, where a bank hiring senior employees exacerbates agency problems at other banks.

Second, a related empirical literature has examined different aspects of the labor market in the financial sector, such as the high labor mobility of investment bankers (Gao et al., 2021, 2022), the career consequences of adverse banker choices (Ellul et al., 2020; Gao et al., 2020; Griffin et al., 2019; Hamdi et al., 2023), and the effect of labor mobility restrictions on financial intermediation (Cici et al., 2021; Agarwal et al., 2024; Bonelli, 2019). A few papers have highlighted the discretionary role of individual bankers in setting lending terms for syndicated loans (Herpfer, 2021; Bushman et al., 2021; Carvalho et al., 2023). We contribute to this literature by showing that labor mobility across firms can lead to the origination of more credit, more risky credit and more financial risk in the context of corporate lending.

Finally, our paper speaks to a recent literature examining the role of outside options in labor markets (Caldwell and Danieli, 2020; Caldwell et al., 2024; Schubert et al., 2022). In particular, Jäger et al. (2022) show that information shifting worker beliefs about outside options affects their search and bargaining behavior. Caldwell and Harmon (2019a) investigate the role of personal networks in transmitting such information about outside options across firms, showing that news transmitted through these networks promotes both wage growth and labor mobility. Building on this work, we adapt a version of their network measure to provide evidence that outside options also influence workers' job related decisions, with adverse implications for their employer's performance and the stability of the financial system.

The structure of the paper is as follows: Section 2 develops the main hypotheses, followed by Section 3, which introduces the data. Section 4 outlines the empirical strategy, and Section 5 presents the results. Finally, Section 6 concludes.

2 Conceptual Framework

The mechanism proposed in this paper operates through a moral hazard channel among bankers. Moral hazard has been incorporated into models of financial intermediation in various ways, such as through risk shifting (Meckling and Jensen, 1976), unobservable effort (Holmström and Tirole, 1998), or the ability of bankers to divert funds (Gertler and Karadi, 2011). The mechanism we examine conceptually links these latter two approaches: improved outside options diminish the expected downside of risky behavior by improving career prospects and reducing the cost of job loss to bankers. This weakens the disciplining role of career concerns (Holmström, 1999), generating moral hazard and reducing effort in the current job. As a result, credit volume and risk increase, implying a co-movement of labor market booms and credit cycles. To build intuition for our em-

pirical analysis we construct a simple model of banker moral hazard arising from labor market outside options.

A bank lends capital K at a given rate r and faces quadratic costs of raising capital γK^2 ($\gamma > 1$) and a repayment probability p. For a given lending amount K it must hire $N = \frac{K}{k}$ bankers, where k captures the lending amount a single banker can administer. Hired bankers must exert effort e to screen potential borrowers where effort is private information and costly at $c(e) = -\frac{e^2}{2}$. Screening effort increases repayment probability p with $p(e) = e$, where $e \in [0, 1]$. In order to induce effort provision by the banker, the bank pays bonus b if the loan is repaid but fires the banker otherwise. In the baseline model, all actions are fully observable. We solve the model using backward induction, starting with the banker problem. Assuming risk neutrality, the banker maximizes

$$U(e) = p(e)b - \frac{e^2}{2} = eb - \frac{e^2}{2} \tag{1}$$

which yields $e^* = b$. The bank maximizes expected profit

$$\max_{K,b} \; p(e)[rK - Nb] - \gamma K^2 = e[rK - \frac{K}{k}b] - \gamma K^2 \tag{2}$$

Taking the solution from the banker problem into account, the problem is

$$\max_{K,b} \; bK[r - \frac{b}{k}] - \gamma K^2 \tag{3}$$

This implies $b^* = \frac{rk}{2}$. Assuming $rk \geq 2$, we have $b = 1$ and $e^* = b = 1$. Moreover, taking the derivative with respect to K, solving for K and plugging in $b = 1$ yields $K^* = \frac{kr-1}{2\gamma k}$. Accordingly, the number of bankers is $N^* = \frac{kr-1}{2\gamma k^2}$.

We modify the model to introduce outside options by assuming that currently employed bankers can expect to receive a reemployment offer conditional on being terminated. The expected reemployment value is given by $\varphi(N)$, which is increasing in current

employment, N. The banker problem becomes:

$$U_{OO}(e) = eb - \frac{e^2}{2} + (1-e)\varphi(N) \tag{4}$$

Maximizing with respect to e, this implies that optimal effort for the banker is $e^* = b - \varphi(N)$, which increases in the bonus payment and decreases in the outside option.

We assume that banks are unaware of their employees taking $\varphi(N)$ into account, which generates moral hazard. As in the case without frictions, the bank sets $b = 1$, and K^* and N^* remain as above. Compared to the baseline model, this implies that effort is distorted away from the optimum by $-\varphi(N)$. The difference in the bank's profit compared to the baseline is $-(Kr - Nb)\varphi(N) < 0$. This captures the intuition that better reemployment chances undercut the disciplining role of terminations. The outside option is generated here as an externality imposed on other banks as hiring by any individual bank affects the outside options at all other institutions.

The magnitude of the distortion is procyclical. Consider an economic expansion causing an outward shift in aggregate credit demand and consequently an increase in r.[1] This implies an increase in K^*, N^*, $\varphi(N)$, and therefore also in the wedge between optimal and actual effort under the outside option scenario. As a result, there is less screening and credit risk increases. This implies that credit cycles arising from fluctuations in real economic activity are amplified via outside options dynamics in the labor market for bankers. While this framework focuses on credit risk, an equivalent model can be constructed for credit quantity, which is also procyclically amplified by the mechanism.

In this model, banks are able to counteract the moral hazard channel by raising b. Under full information, they would set $b = e^* + \varphi(N)$ to induce $e^* = 1$, but commonly fail to do so, as they do not take the externality arising from overall increases in hiring into

[1] Equivalent dynamics arise in response to a decrease in the marginal costs of deposit γ

account. Yet, if banks manage to adjust b, we expect the positive effect of outside options on risky lending to be alleviated.

To summarize, our theoretical considerations suggest that better labor market outside options increase credit supply and credit risk. The positive effect of outside options on risk-taking is procyclical, but can be counteracted by adequate compensation structures. Several assumptions are required to arrive at these predictions. First, we assume that changes in other banks' hiring behavior lead to variation in bankers' outside options. This assumption is relatively weak, as the banking sector experiences limited entry by workers, particularly at mid-to-late career stages (Philippon and Reshef, 2012; Bell and Van Reenen, 2014; Böhm et al., 2023). Moreover, the supply of qualified graduates is likely relatively inelastic, and senior roles cannot easily be filled by junior bankers. As a result, job-to-job transitions are common in banking. Second, our results hinge on the assumption that individual bankers influence loan decisions. Although loan sizes are substantial in the syndicated loan market, making this effect non-trivial, there is extensive evidence documenting the discretionary role of individual bankers in determining lending terms for syndicated loans (Herpfer, 2021; Bushman et al., 2021; Carvalho et al., 2023). Third, we assume that banks do not adjust compensation in response to current labor market conditions to mitigate the adverse effects of improved outside options. While this assumption is fairly strong, similar dynamics would emerge if adjustments were imperfect, for example, due to inattention, financial constraints, or wage rigidity. Thus, insofar as compensation does not perfectly reflect outside options, these dynamics generate misaligned incentives.

While our model considers outside options in their literal sense as alternative employment opportunities, a number of additional mechanisms could be at play. First, better outside options are likely to increase turnover. As a result, expected tenure decreases, reducing the probability of a loan default realizing during the current employment spell and hence of being punished for excessive risk-taking. This diminished threat of punish-

ment may incentivize bankers to take on greater risk. Second, behavioral factors could also be relevant in this setting. For example, the literature on diagnostic expectations suggests that after being exposed to positive cues, individuals tend to form more optimistic expectations (Bordalo et al., 2024). Accordingly, favorable news about outside options could lead bankers to become overly optimistic, adopt less prudent behavior, and engage in riskier lending practices. Finally, improved outside options may drive strategic behaviors beyond the scope of our model. Bankers could use their enhanced bargaining power to negotiate *golden parachutes*, i.e. better severance packages, thereby increasing risk-taking due to lower potential for punishment. Similarly, with a higher probability of switching employers, bankers might focus on resume building, emphasizing observable productivity metrics such as loan volume over considerations of employer default risk.

3 Data

For our analysis, we combine data on syndicated lending with employment histories of senior US investment bankers obtained from *Revelio Labs* as well as supplementary data sources on firm performance and wages. We focus on the syndicated lending market for three main reasons. For one, syndicated loans are a dominant form of lending to US firms, with the overall market volume totaling $2.8 trillion in 2018, compared to the $1.3 trillion volume in the corporate bond market. Second, the risk associated with loan default is not contained with a single financial institution but disseminated throughout the financial sector via the syndication process itself as well as through trading and securitization in the secondary market (Mugasha, 2004). Finally, lending choices can be clearly attributed to the arranging bank, with prior literature suggesting that individual lead bankers exercise significant influence on the design of these loans (Herpfer, 2021; Bushman et al., 2021). In short, individual senior bankers have agency in making lending decisions with significant ramifications for overall financial stability.

Dealscan: Data on lending activity by banks are taken from the *Dealscan* database. From the universe of loans recorded in the database, we identify the largest lead arranging banks in terms of the number of loans issued and include all tranches arranged by these banks in our sample. For each loan we include information on the borrowing and lending firm identity, tranche amount and maturity, whether the loan is secured and whether covenants are attached. We construct several variables from the tranche-level data. To measure credit quality, we construct an indicator equal to one for borrowers that have an investment-grade rating. To measure credit quantity, we aggregate the data to the lender-quarter level to obtain both the number of loans and total lending volume. Summary statistics are shown in Table A1.

Revelio Labs: We draw on labor market data from Revelio Labs, which collects employment biographies reported on LinkedIn. The dataset includes employment details for the universe of public profiles, covering nearly 500 million workers across approximately 1.8 billion employment spells. The linked employer-employee data contain employment spell start and end dates, as well as the individual's self-reported location and job title. From this information, Revelio Labs generates a task-based classification of job titles, which maps activities to each title by analyzing descriptions from resumes and online profiles, alongside responsibilities listed in job postings.[2] Initially, the algorithm identifies 1,500 job roles, which are successively aggregated using a clustering algorithm. The data also include a seniority ranking derived from job titles, ranging from 1 (lowest) to 7 (highest).

To construct our sample of senior bankers, we proceed as follows. First, we exclude all employment spells outside the United States. Second, we use the job taxonomy at the hierarchical level that defines 300 distinct roles, allowing us to identify the individuals employed in the relevant roles.[3] Third, to identify senior bankers we only retain spells

[2]For additional details, see www.reveliolabs.com.

[3]The included roles are: "Investment Specialist", "Investment Banking", "Banker", "Credit Specialist", "Financial Advisor", "Loan Officer", and "Financial Analyst".

with a seniority level at or above 4. Finally, we only include full-time bankers by excluding overlapping spells. We use all employment spells between 1994 and 2020.[4] Table A2 shows summary statistics for this sample. As expected, the sample predominantly consists of male, white, senior, and highly educated employees with high incomes (annually around $150,000 on average). Due to the backfilled nature of the employment histories, the mean age of employees is relatively young, at 37 years. Table A3 compares key demographic variables between the LinkedIn dataset and administrative data sources. Qualitatively, the sample captures the key characteristics of individuals employed in the financial industry reported in the CPS and ACS. These similarities are even more pronounced when the restriction on seniority is removed.

For our main analysis, we combine the lending data from Dealscan with an outside options proxy calculated from employment histories at the parent company level. To this end, we sequentially merge on exact co-occurrences of parent companies' GVKEY, ticker, and company names, which are cleaned and normalized beforehand, retaining only unique merges. For unmatched observations, we repeat the procedure at the subsidiary level, linking parent companies through their subsidiaries when matches are identified. In cases where multiple subsidiaries match, we prioritize the match associated with the highest number of spells for each lender parent. We manually verify all matches and identify additional ones. In this way, we are able to merge 1268 parent companies, comprising two-thirds of subsidiaries in Dealscan. Among the 1000 largest lenders, this accounts for 99% of individual loans and 91% of total lending volume.

Compustat: We obtain data on firm level fundamentals from Compustat. For both borrowing and lending firms, we include data on ratings, assets, liabilities, net income, EBIT, short-term debt, long-term debt, employees, shareholder equity, and capital expenditure, with summary statistics shown in Table A4. Crucially, we also include borrower firm

[4]The information has been collected since 2019 but contains all self-reported employment spells from earlier periods.

S&P credit ratings as a measure for credit risk and repayment probability. We use link tables by Chava and Roberts (2008) and Schwert (2020) to match Dealscan and Compustat borrower and lender firms.

(Conditional) Value at Risk: To measure financial risk, we use data from Adrian and Brunnermeier (2016) available at quarterly frequency between 1994 and 2009. The first measure is *Value at Risk* (VaR), which captures the maximum loss for an institution i in a 99% confidence interval, i.e., the financial risk at the level of the lending bank. The second variable is *Conditional Value at Risk* (CoVaR), defined as the VaR of the financial sector conditional on bank i being in distress. In other words, CoVar quantifies the expected loss to the financial system conditional on a 99th percentile loss at bank i, capturing the (non-causal) contribution of bank i to systemic risk. Adrian and Brunnermeier (2016) estimate these measures using quantile regressions. Summary statistics are shown in Table A5.

BoardEx: We take information on banker pay from BoardEx, a database provided by *Delinean*. These data include detailed information on compensation for top executives of large, listed companies in the United States since 1997. We focus on roles with operational responsibilities rather than executive oversight, as compensation at non-executive levels aligns more closely with agent incentivization within our conceptual framework.[5] Summary statistics for company-year level averages of total compensation, salary, and bonuses are presented in Table A5. For our analysis, we calculate within-company individual-level growth rates of those variables as first differences of their inverse hyperbolic sine transformation, which we average at quarterly frequency for each company.

[5]This includes all role names containing "Director", "President", "VP", "Director", or "MD", excluding those that contain "CEO", "Chair", "Trustee", or "Partner".

4 Empirical Strategy

This section describes the empirical strategy used to estimate the effect of outside options on lending behavior at the level of institutions and individual bankers. We first detail the construction of our network-based measure of outside options, followed by a number of validation tests and the main empirical specification.

We construct a measure of outside options that is orthogonal to other bank-specific shocks that may also influence lending outcomes. To achieve this, we focus on variation in labor demand at other firms and leverage the idea that information about job opportunities and hiring processes is transmitted through coworker networks. The role of social networks in shaping labor market outcomes has been extensively documented, both theoretically (Montgomery, 1991; Schönberg et al., 2010) and empirically (Bramoullé and Saint-Paul, 2010; Hensvik and Skans, 2016; Glitz, 2017; Gee et al., 2017; Saygin et al., 2021; Cingano and Rosolia, 2012). We utilize LinkedIn data on worker job transitions, which are based on publicly available information.

At its core, our outside options measure counts new hires at other firms, weighted by the share of former coworkers there, capturing bank-time variation in exposure to signals about labor market dynamics. More formally, for bankers at a given bank i in quarter t, our measure of outside options is defined as follows:

$$InflowsAtTies_{it} = \sum_{j \neq i} w_{ijt} \times Inflows_{-i,jt} \tag{5}$$

Thus, $InflowsAtTies_{it}$ is the weighted sum of inflows at other banks j, denoted by $Inflows_{-i,jt}$. The latter term is defined as job-to-job transitions from other lending firms $k \neq i$ to firm j in quarter t:

$$Inflows_{-i,jt} = \sum_{k \notin \{i\}} Transitions_{kjt} \tag{6}$$

We exclude transitions from firm i to j in t from our calculation in order to ensure orthogonality between our outside options measure and any firm-level dynamics in firm i over time.

The weights measure the share of former coworkers at a given firm. More specifically, the weight firm i attributes to j at time t counts the number of past transitions from the former to the latter, divided by the number of past transitions to all other firms:

$$w_{ijt} = \frac{\sum_{h\in(2:11)} Transitions_{ij,t-h}}{\sum_{j\neq i}\sum_{h\in(2:11)} Transitions_{ij,t-h}} \tag{7}$$

Thus, the weights capture social ties workers have to other firms and the exposure to activities at those firms.[6] In our baseline specification, we focus on ties that are between 2 and 12 quarters old. We limit the tie duration to 3 years to account for weakening social ties over time as well as potential follow-up transitions of those former coworkers to a third firm. We also include ties only half a year after the transition to ensure that outflows from a firm do not contemporaneously affect the tie weight component of our measure. Thus, in our measure, contemporaneous outflows from a firm enter our measure neither as labor demand at other firms nor as a tie-weight.

The measure $InflowsAtTies_{it}$ was initially proposed by Caldwell and Harmon (2019a) and has several properties that make it well-suited to our setting. First, it captures firm-level variation in signals about labor demand, shifting beliefs of workers about their outside options. Prior work shows that such beliefs affect not only job search and bargaining intentions of workers (Jäger et al., 2024) but also search and bargaining outcomes (Caldwell and Harmon, 2019a). We expect this information transmission channel to be relevant, given the importance of professional networks (Godechot, 2014) and the widespread usage of LinkedIn in the financial industry (Fracassi et al., 2016;

[6]The LinkedIn dataset does not include information about the profile connections of LinkedIn profiles. Therefore we are unable to base our network measure on social ties as indicated by these connections. Instead, we assume that ties are formed between senior investment bankers working in the same firm at the same time and that those ties persist for some limited time after one banker moves to another firm.

Jiang et al., 2018). Second, the weighting approach provides an intuitive method of accounting for a bank i's worker placement record in the recent past. Workers should place higher weight on labor demand at firms that are "achievable" for them, which is captured by our proxy. At the same time, firm size and the corresponding size of the coworker network leave our proxy unaffected, as we weigh inflows by the share rather than the number of ties at other firms. Third, the measure relies exclusively on variation in employment flows across firms. Alternative approaches (e.g. as in Caldwell et al., 2024) based on worker concentration across industries or occupations are unsuitable in the context of a single occupational group. Similarly, outside options measures relying on regional variation are unsuitable, given the concentration of senior investment bankers in a small number of financial hubs.

To construct the measure, we first identify workers for whom at least one spell conforms to the exclusion criteria outlined in Section 3, in order to select senior investment banking employment spells in the US. Next, we extract the employment histories of these individuals to trace their connections to other institutions. We also extract all senior investment banking spells at those other firms. Based on this sample of spells, we compute $InflowsAtTies_{it}$ in the way described above and standardize the resulting measure to have mean zero and a standard deviation of one. In our main estimation sample, we observe on average 293 bankers per institution, with 159 ties to other banks and 13 transitions to other banks in a given quarter. We refer to table A7 for summary statistics.

We conduct a number of tests to check the validity of our measure. First, we replicate the findings of (Caldwell and Harmon, 2019b) on the mobility and wage effects of outside options. We also rule out that our measure of outside options is driven by current or recent firm level dynamics.

To examine the link between outside options and employee mobility, we regress employee outflows from a given bank to other banks on our outside options proxy, a set of leads and lags, as well as on bank and year-quarter fixed effects. The results are presented

in Table 1. Column (1) shows that outside options increase employee outflows, with persistent and even increasing effects. The persistence of the effect is consistent with a news shock shifting belief and affecting search behavior over the medium term. At the same time, we find no evidence of our outside options proxy being driven by past employee outflows. In columns (2) and (3), we further distinguish outflows associated with job-to-job transitions into more senior positions from other types of outflows. While both patterns are qualitatively similar, the results suggest that job upgrades primarily drive the observed effects. This highlights that fluctuations in outside options are particularly relevant for facilitating upward career transitions.

Table 1: Effect of Outside Options on Mobility

Model	Outflows	Outflows Up Poisson	Outflows Non-Up
	(1)	(2)	(3)
Inflows at Ties (Lead 4)	0.003 (0.012)	0.008 (0.017)	-0.0001 (0.012)
Inflows at Ties (Lead 3)	0.016 (0.011)	0.016 (0.013)	0.017 (0.011)
Inflows at Ties (Lead 2)	0.012 (0.009)	0.021* (0.013)	0.002 (0.008)
Inflows at Ties (Lead 1)	0.014 (0.015)	0.020 (0.022)	0.009 (0.012)
Inflows at Ties	0.040*** (0.014)	0.061*** (0.023)	0.020* (0.010)
Inflows at Ties (Lag 1)	0.046*** (0.010)	0.056*** (0.013)	0.038*** (0.011)
Inflows at Ties (Lag 2)	0.074*** (0.014)	0.093*** (0.018)	0.057*** (0.013)
Inflows at Ties (Lag 3)	0.082*** (0.013)	0.092*** (0.015)	0.073*** (0.012)
Inflows at Ties (Lag 4)	0.089*** (0.020)	0.098*** (0.026)	0.082*** (0.016)
Observations	49,727	49,727	48,418
Lender + Year-Quarter fixed-effects	Yes	Yes	Yes

Notes: The table shows coefficients from regressions of employee outflows on standardized inflows at ties, contemporaneously and including up to four lags and leads of the explanatory variable. The dependent variables are the total counts of employee (1) outflows, (2) outflows with job-to-job transition to more senior positions, and (3) other outflows not considered in (2). The coefficients are estimated using the Poisson estimator for dispersed count variables with meaningful zeros (Wooldridge, 1999). All regressions include fixed effects at the lender and year-quarter level. Standard errors clustered at the lender level included in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Second, we analyze to what extent better outside options translate into gains in compensation among employees who do not switch firms. To this end, we regress first differences in log compensation on our outside options proxy, conditional on lender and year

fixed effects. Since compensation is reported only at an annual frequency, we include one lag and one lead from adjacent periods. The results are reported in Table 2. As we show in column (1), better outside options lead to sizable increases in growth of total compensation. In columns (2) and (3), we focus on the two main components of compensation, base salary and bonuses. The findings suggest that increased compensation growth is entirely driven by salary growth. This is consistent with the findings in the literature that show that workers mostly bargain over wages, not bonuses or amenities (Caldwell et al., 2024).

Table 2: Effect of Outside Options on Pay

	$\Delta log(\overline{TotalComp})$		$\Delta log(\overline{Salary})$		$\Delta log(\overline{Bonus})$	
	(1)	(2)	(3)	(4)	(5)	(6)
Inflows at Ties (Lead 1Y)	-0.027	-0.017	-0.023	-0.020	-0.073	-0.030
	(0.027)	(0.028)	(0.019)	(0.020)	(0.072)	(0.072)
Inflows at Ties	0.049***	0.050***	0.049***	0.047***	0.005	0.022
	(0.015)	(0.017)	(0.014)	(0.016)	(0.044)	(0.047)
Inflows at Ties (Lag 1Y)	-0.038	-0.035	-0.038	-0.037	-0.034	-0.026
	(0.036)	(0.035)	(0.028)	(0.027)	(0.059)	(0.063)
Lender Controls	No	Yes	No	Yes	No	Yes
Observations	451	451	451	451	451	451
Lender + Year-Quarter fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table shows regressions of first differences in log compensation, both total and components thereof, on standardized inflows at ties, contemporaneously and including one lag and lead of the explanatory variable. The dependent variables (1) total compensation, (2) salary, (3) bonus payments. All regressions include fixed effects at the lender and year level. Standard errors clustered at the lender level included in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Third, we ensure that our measure of outside options is not driven by observable bank-level covariates. To test this, we regress inflows at ties on changes in balance-sheet fundamentals from Compustat. The results, included in Table A8, suggest that, conditional on the fixed effects, inflows at ties are orthogonal to current and recent observable firm dynamics.

One potential concern is that stronger ties to other institutions may also increase the information available to potential new employers about bankers' on-the-job behavior at

their current firm. Former colleagues can better assess and monitor the performance of an individual banker and issue recommendations on whether or not to hire them. Hence one could argue that bankers become more cautious as signals about labor demand at other firms suggest increased monitoring of their current actions. Similarly, a shock to the network that increases its dispersion across firms, i.e. distributes monitoring capacity of their choices increases to more firms, might make bankers more cautious. Given these counteracting effects, we consider our estimated coefficients to represent a lower bound on the true estimate.

We examine the impact of outside options on the quality and the quantity of loans arranged. We also investigate the impact of outside options on the financial risk of the arranger firm and of the risk of the financial system. For the effect on credit quality we estimate a loan level regression. Specifically, consider a bank i issuing a loan l to borrower b in year-quarter t. The loan-level specification is as follows:

$$y_{iblt} = \beta InflowsAtTies_{i,t} + \Gamma V_{it} + \Theta W_{bt} + \Pi Z_l + \alpha_i + \lambda_t + \epsilon_{iblt}, \tag{8}$$

where y_{iblt} is an indicator variable equal to one if the borrower firm has an investment grade rating. We regress this indicator on the current level of $InflowsAtTies_{it}$ and add time-varying control vectors for lender firms V_{it} and borrower firms, W_{bt}. Both vectors include the inverse hyperbolic sine transformations of total assets, number of employees, capital expenditure, total liabilities, and EBIT. On the borrower side, we also add fixed assets, as they are commonly used as collateral. Moreover, we control for loan-level characteristics Z_l, which consist of the tranche amount and maturity (both in terms of their inverse hyperbolic sine), whether the loan is secured, and whether covenants are attached. Lastly, α_i and λ_t are fixed effects at the bank and year-quarter level. Standard errors are clustered at the lender level.

The effect of outside options on lending volume and financial risk are estimated at the bank-time level. For a given year-quarter t at bank i, we estimate the dynamic response of the outcome variable to an outside options shock with the equation

$$y_{it} = \beta^4_{h=0} InflowsAtTies_{i,t-h} + \Gamma V_{it} + \alpha_i + \lambda_t + \epsilon_{it} \tag{9}$$

where for each outcome variable we are interested in the series of coefficients $\beta^4_{h=0}$, which describe the dynamic response of the outcome variable to an outside options shock. These specifications only include lender-time controls but are otherwise identical to those described by equation (8).

The coefficients of interest from these shift-share reduced-form regressions are β and the series $\{\beta_h\}^4_{h=0}$, respectively. They describe the reaction of outcome variables on variation in our outside options proxy. As argued in section 2, we expect increases in loan- and bank-level measures of risk. Following Borusyak et al. (2022), the identifying assumption is that, conditional on covariates and fixed effects, unobserved determinants of lending choices or bank risk are unrelated to variation in labor demand in connected banks.[7]

5 Results

We use our proxy measure to examine the influence of outside options on credit supply. Beginning with loan-level outcomes, we document increased borrower risk in response to improved outside options. In support of a moral hazard explanation, we show that

[7] While estimates from these designs are valid under different sets of assumptions, we rely a set of two conditions derived in Borusyak et al. (2022) for shift-share IV and reduced form estimations. First, regarding exogeneity, it is sufficient for shocks to be as-good-as-randomly assigned, without requiring exogeneity of the weights. This condition is likely to hold in our setting, where labor demand shocks at other banks are, conditional on controls, arguably uncorrelated with unobservable factors that determine a bank's outcomes. Second, identification requires sufficient variation in the underlying shock, which is satisfied if the number of shocks is large and relatively independent — that is, if shocks affect only a small number of other units. This assumption is likely to be satisfied, as the transition matrix across banks is sparse, and mobility across institutions is heterogeneous, leading to sufficiently heterogeneous exposure across units.

effects are counteracted by higher bank bonus payments. We then examine the effect of outside options on credit volume and financial risk at the lender level.

5.1 Loan Level

First, we estimate the effect of outside options on credit risk. We proxy the default risk of a loan with the credit rating of the borrower firm. Specifically, our outcome variable is an indicator for an investment-grade rating by S&P. Table 3 presents coefficients obtained by estimating equation (8). Column (1) indicates that a one standard deviation shock in inflows at tied firms leads to a 1 percentage point decrease in the share of loans given to investment-grade borrower firms. Compared to the baseline share of investment-grade ratings of 30%, this represents a 3.3% increase on impact. Results are identical when including the borrower, lender, and loan control vectors. We also estimate a logit model, which indicates a decrease in the probability of an investment grade borrower firm by $exp(-0.061)-1 = 6.3\%$. The result is robust to using the entire ordinal rating scale (from 0 to 7 pre-standardization) as the dependent variable. Taken together, these results suggest that outside options of bankers lead to a decline in the quality of credit.

We conduct a number of robustness checks, with results reported in Table A9. The estimated coefficients remain comparable and significant when adding borrower-sector×year, borrower-industry×year, or lender×year fixed effects. Results are also robust to including the size of the coworker network or the number of current banker outflows as a control variable, and to limiting the sample to post-2008 years or novel loan originations. We also check for and rule out pre-trends.

In our conceptual framework, effort decreases when outside opportunities improve. However, the principal can offset this effect by raising performance-based incentives. We test whether banks that pay bonuses see a smaller increase in borrower risk for a given outside options shock. For this purpose, we use the earnings data from *Boardex* to construct a binary indicator variable for positive average bonus payments at a given bank in

Table 3: Effect of Outside Options on Lender Risk

	Investment Grade Borrower			Borrower Rating (std.)
	(1)	(2)	(3)	(4)
	OLS	OLS	Logit	OLS
Inflows at Ties	-0.010*** (0.003)	-0.010*** (0.002)	-0.061*** (0.016)	-0.018*** (0.005)
Borrower + Lender + Loan Controls	No	Yes	Yes	Yes
Observations	50,737	50,579	50,579	50,579
Lender + Year-Quarter fixed-effects	Yes	Yes	Yes	Yes

Notes: The table reports results from estimating equation (8) at the loan level. The dependent variables are an indicator for investment-grade borrowers (columns 1 to 3) and an ordinal seven-point borrower rating scale, normalized to have mean zero and a standard deviation of one (column 4). The independent variable is our outside options proxy, inflows at ties. Borrower and lender controls are the inverse hyperbolic sine transformation of total assets, number of employees, capital expenditure, total liabilities, EBIT, and (for borrowers) fixed assets. Loan controls are the inverse hyperbolic sine transformation of tranche amount and maturity, and indicators for whether the loan is secured, and whether covenants are attached. All regressions include fixed effects at the lender and year-quarter level. Columns (1), (2) and (4) are estimated via OLS, while column (3) shows results from estimating a logit model. Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

a given year. We interact this indicator with our outside options proxy and report results in table 4.

Columns (1) and (2) indicate that the standalone coefficients on inflows at ties remain negative and become slightly larger compared to the baseline results, whereas the estimated coefficients on the interaction term are positive. Thus, the impact of improved outside options is confined to those banks that do not offer bonuses. Given the fixed effects structure, this conversely implies that when banks raise performance incentives in response to an outside options shock, screening effort does not decline. To rule out that these results are driven by potential simultaneity of risky lending choices and bonus payments, we use bonuses from the previous year in column (3). We also test the direct relationship between bonuses and lending choices and find no direct relationship in column (4). Overall, these results are consistent with an interaction of outside options and moral hazard inside the banks.

Table 4: Moral Hazard Channel

	Borrower Prime			
	(1)	(2)	(3)	(4)
Inflows at Ties	-0.015*** (0.003)	-0.015*** (0.004)	-0.021** (0.007)	
Bonus	0.027 (0.020)	-0.002 (0.031)		0.016 (0.019)
Inflows at Ties × Bonus	0.022** (0.008)	0.018** (0.008)		
Bonus (Lag 1Y)			-0.007 (0.014)	
Inflows at Ties × Bonus (Lag 1Y)			0.034*** (0.011)	
Borrower + Lender + Loan Controls	No	Yes	Yes	No
Observations	9,938	9,938	9,911	9,938
Lender + Year-Quarter fixed-effects	Yes	Yes	Yes	Yes

Notes: The table reports results from regressing an indicator for investment-grade borrowers on different combinations of $InflowsAtTies_{it}$ and $Bonus_{it}$, which is an indicator for positive average bonus payments at a given bank in a given year. In columns (1) and (2), independent variables are $InflowsAtTies_{it}$, $Bonus_{it}$, and their interaction; in column (3), independent variables are $InflowsAtTies_{it}$, $Bonus_{it-1}$, and their interaction; in column (4), the independent variable is $Bonus_{it}$. Borrower and lender controls are the inverse hyperbolic sine transformation of total assets, number of employees, capital expenditure, total liabilities, EBIT, and (for borrowers) fixed assets. Loan controls are the inverse hyperbolic sine transformation of tranche amount and maturity, and indicators for whether the loan is secured, and whether covenants are attached. All regressions include fixed effects at the lender and year-quarter level. Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.2 Lender Level

Next, we investigate whether bankers with better outside options lend more. We examine both the effect on the number of loans issued and the overall lending volume. To answer this question, we calculate both outcomes for a given lender bank at the quarterly level and estimate a Poisson model that includes the outside options proxy, lags thereof, lender controls as well as lender and year-quarter fixed effects. Results are reported in table 5.

Columns (1) and (2) show that a standard deviation increase in outside options leads to an increase in lending volume of 2-3% per quarter, starting in the second quarter after the shock, and a cumulative 7-11% after one year. Columns (3) and (4) suggest that this increase is partially, but not fully driven by an increase in the number of loans arranged by banks. That is, bankers increase lending both on the extensive and the intensive margin. The number of loans increases by 2% per quarter starting in the second quarter after the shock, and around 4% cumulatively after a year. The slight delay in the observed

Table 5: Effect of Outside Options on Lending Volume

Estimator	Loan Volume		Loan Number	
	Poisson			
	(1)	(2)	(3)	(4)
Inflows at Ties	0.007 (0.013)	0.002 (0.012)	-0.006 (0.013)	-0.003 (0.013)
Inflows at Ties (Lag 1Q)	0.031*** (0.011)	0.020* (0.011)	0.020* (0.011)	0.022** (0.011)
Inflows at Ties (Lag 2Q)	0.030*** (0.009)	0.023*** (0.007)	-0.006 (0.015)	-0.003 (0.014)
Inflows at Ties (Lag 3Q)	0.019* (0.010)	0.009 (0.008)	0.018 (0.011)	0.019* (0.011)
Inflows at Ties (Lag 4Q)	0.035*** (0.012)	0.025*** (0.010)	-0.0002 (0.016)	0.002 (0.015)
Lender Controls	No	Yes	No	Yes
Observations	4,570	4,570	4,570	4,570
Lender + Year-Quarter fixed-effects	Yes	Yes	Yes	Yes

Notes: The table reports results from Poisson regressions of total volume (columns 1 and 2) and the number of loans (columns 3 and 4) on our outside options proxy, $InflowsAtTies_{it}$, and its lags. Lender controls are the inverse hyperbolic sine transformation of total assets, number of employees, capital expenditure, total liabilities, and EBIT. All regressions include fixed effects at the lender and year-quarter level. Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

timing of the effect is most plausibly attributed to the average eight-week arrangement period required for syndicated loans (Godlewski, 2008). Since loans are recorded only after negotiations are finalized and the contract becomes effective, an exogenous shock to outside options would reasonably influence the quantity of new loans with a lag of one quarter.

Finally, we investigate the effect of banker outside options on the resulting financial risk of the lending bank. We are interested in both the effect on financial risk at bank itself and the risk to the overall financial sector through a given bank. To measure financial risk, we draw upon the work by Adrian and Brunnermeier (2016), who propose measures for both types of risks. Financial risk for a given bank in isolation can be expressed in terms of the *Value at Risk* (VaR), which is formally defined as the maximum loss to a firm at a given confidence level. A bank's contribution to overall systemic risk is captured by CoVaR, which is formally defined as the VaR of the financial sector conditional on losses at that bank. We take the values estimated by Adrian and Brunnermeier (2016) for the

99% confidence level and estimate regressions of log changes in both types of risk on our outside options proxy. Results are presented in table 6.

Table 6: Effect of Outside Options on Financial Risk

	$\Delta log(VaR)$		$\Delta ln(CoVaR)$	
	(1)	(2)	(3)	(4)
Inflows at Ties	0.042** (0.017)	0.041** (0.017)	0.038** (0.017)	0.037** (0.017)
Inflows at Ties (Lag 1Q)	-0.061* (0.033)	-0.062* (0.034)	-0.044 (0.031)	-0.044 (0.031)
Inflows at Ties (Lag 2Q)	0.016 (0.029)	0.015 (0.029)	-0.002 (0.028)	-0.003 (0.028)
Inflows at Ties (Lag 3Q)	0.013 (0.037)	0.013 (0.037)	0.022 (0.039)	0.022 (0.039)
Inflows at Ties (Lag 4Q)	-0.012 (0.023)	-0.012 (0.023)	-0.017 (0.024)	-0.016 (0.024)
Lender Controls	No	Yes	No	Yes
Observations	2,342	2,342	2,342	2,342
Lender + Year-Quarter fixed-effects	Yes	Yes	Yes	Yes

Notes: The table reports coefficients from an OLS regression of log changes in bank risk (VaR) and systemic risk (CoVaR) on our outside options proxy, $InflowsAtTies_{it}$, and its lags. Lender controls are the inverse hyperbolic sine transformation of total assets, number of employees, capital expenditure, total liabilities, and EBIT. All regressions include fixed effects at the lender and year-quarter level. Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Columns (1) and (2) show that a standard deviation outside options shock increases the growth of bank risk at the lender bank by 4%. The effect appears to be transitory and offset in the second quarter; however, this coefficient is less precisely estimated. There is also an instantaneous and almost complete transmission of the increased risk into the financial sector writ large, with a contemporaneous increase in the growth rate of systemic risk of almost 4%. For CoVaR, the first lag of the coefficient is negative, too, but it is even less precisely estimated and is not significant at the 10% level. Therefore, these results suggest that shocks to banker outside options lead to a temporary hike in lender risk and a potentially more permanent increase in systemic risk. Given that our inclusion criterion for employment histories was limited to corporate bankers and did not include traders, fund managers and other occupations, we only capture the outside options for a subpopulation of the entire risk-taking workforce in any investment bank. Hence, we consider our estimates to be a lower bound for the overall effects of outside options on bank and systemic risk.

6 Conclusion

The evidence presented in this paper suggests that shocks to labor market outside options of corporate bankers lead to riskier lending, with negative effects on borrower credit quality. They further drive increases in the number of loans as well as overall loan volume. This effect is relevant for financial stability, as we document effects of outside options on financial risk of lender banks and of the financial system. Our mechanism analysis suggests that a moral hazard channel is driving these results.

Our results indicate that labor market conditions can undermine the effectiveness of disciplining mechanisms, such as the threat of layoffs, in mitigating moral hazard among bankers. One option to counteract this channel would be for banks to move away from bargaining over base compensation towards relying more heavily on bonuses in retaining talent. However, it is important to consider that performance-based compensation could also introduce excessive risk through other mechanisms (Litov and Sepe, 2016; Tzioumis and Gee, 2013; Efing et al., 2015). Moreover, macro-prudential policymakers should monitor the labor market in the financial sector as an indicator and potential source of systemic risk in financial intermediation. Even though this paper does not present an estimate for an optimal level of labor mobility, the findings suggest that policymakers should be wary of hot labor markets in the financial sector.

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A Additional Tables

Table A1: Summary Statistics: Dealscan Lender-Level Data

Variable	N	Mean	SD	P25	P50	P75
Borrower Investment Grade Rating	50737	0.3	0.46	0	0	1
Borrower Rating	50737	3.7	1.6	2	4	5
Tranche Amount	50737	908	1616	150	400	1000
Maturity	50737	50	23	36	59	60
Secured	50737	0.52	0.5	0	1	1
Covenants	50737	0.48	0.5	0	0	1

Notes: The table reports loan-tranche level summary statistics for our sample of Dealscan loans. Included are loan observations by the largest lead arranger banks, for which they were the lead arranger. *Borrower Investment Grade Rating* is based on the SPGMI quality index at a standard cutoff of B+ or above. *Borrower Rating* ranges from 0 default, to 8, A+. *Tranche Amount* is converted to million $. *Maturity* is indicated in months. *Secured* is an indicator for whether or not the tranche is secured. *Covenants* is an indicator for whether or not financial covenants exist.

Table A2: Summary Statistics: Employment History Data

	Mean	Weighted Mean	SD	P25	P50	P75	N
Male	0.69	0.68	0.46	0.00	1.00	1.00	801049
White	0.78	0.78	0.42	1.00	1.00	1.00	802908
Bachelor	0.50	0.50	0.50	0.00	1.00	1.00	634528
More than Bachelor	0.48	0.48	0.50	0.00	0.00	1.00	634528
Salary (in 1000)	150.06	149.55	69.22	102.56	135.27	181.38	803076
Age at Start	33.55	33.53	8.18	28.20	32.60	38.40	771951
Age at Middle	36.69	36.66	8.28	30.85	35.68	41.71	771951
Age at End	39.83	39.80	9.69	32.91	38.31	45.36	771951
Seniority	4.75	4.75	0.74	4.00	5.00	5.00	803096
Nr. of Previous Positions	3.02	3.03	2.62	1.00	3.00	4.00	803096

Notes: The table reports spell-level summary statistics on demographic variables for the sample of senior employees working in credit origination described in Section 3. The sample includes all employment spells that are reported in the United States, in the respective job roles, and at seniority level 4 or above. *Male*, *White*, *Bachelor*, and *More Than Bachelor* are indicator variables equal to one for the corresponding categories. *Salary* is an imputed measure based on observable characteristics of an employment spell. The age variables refer to the beginning, middle, and end of an employment spell. *Seniority* refers to the seniority ranking, taking values between 4 (lowest) and 7 (highest). *Nr. of Previous Positions* counts the number of positions held prior to the current spell. The variable *Weighted Mean* exploits sampling weights constructed by Revelio Labs (see here for details).

Table A3: Summary Statistics: Employment History Data vs. Administrative Data

	Estimation Sample	Full Sample	CPS	ACS
Male	0.68	0.63	0.57	0.57
White	0.78	0.74	0.84	0.82
Bachelor	0.50	0.56	0.49	0.46
More than Bachelor	0.48	0.40	0.17	0.17
Salary (in 1000)	149.55	102.10	98.31	100.91
Age	36.66	32.15	40.84	40.13
Observations (in 1000)	607.60	1657.54	20.23	304.14

Notes: The table reports spell-level weighted averages of demographic variables, comparing the employment biography data against demographic sources. *Estimation Sample* includes all employment spells that are reported in the United States, in the respective job roles, and at seniority level 4 or above, as described in 3. *Full Sample* relaxes the latter restriction and includes all seniority levels of the employment spell data. *CPS* and *ACS* rely on administrative data from the *Current Population Survey* and the *American Community Survey*, respectively. For the CPS and ACS, we retain all observations between 1994 and 2023 of individuals that are in the labor force, at work and in full-time employment, below 66 years, and with hourly income of at least 10$ (21600$ annually). We restrict the sample to employment in the financial industry (1990 industry classification code between 700 and 710) and occupations related to loan origination (2010 occupation codes 0120, 0830, 0840, 0850, 0910, and 4820). *Male*, *White*, *Bachelor*, and *More Than Bachelor* are indicator variables equal to one for the corresponding categories. *Salary* is an imputed measure based on observable characteristics of an employment spell. *Age* refers to age at the middle of employment spell for the spell-level data. *Observations* shows the number of observations that are non-missing for all of the above variables.

Table A4: Summary Statistics: Compustat Borrower and Lender-Level Data

Variable	N	Mean	SD	P25	P50	P75
Borrower Assets	50737	28265	115560	1783	6208	18590
Borrower Capex	50737	962	2630	43	155	636
Borrower Employees	50737	32	100	2.8	9	26
Borrower Liabilities	50737	21864	101568	1131	4176	13194
Borrower EBIT	50727	1312	3730	78	352	1110
Borrower Net Income	50650	611	2857	-3.4	111	508
Borrower Current Liabilities	50713	2544	18108	10	74	492
Borrower Long Term Liabilities	50700	8079	21720	500	1979	6782
Borrower Stockholder Equity	50737	6027	17235	344	1419	4533
Lender Assets	50737	1350736	817298	723859	1198942	1955163
Lender Capex	50737	1415	2261	0	810	1377
Lender Employees	50737	117	84	51	80	189
Lender Liabilities	50737	1253336	763225	679820	1102753	1863074
Lender EBIT	50737	22140	14964	11658	18716	30828
Lender Net Income	50737	7927	7745	3094	6083	11354
Lender Current Liabilities	50737	180794	124763	79461	166590	261525
Lender Long Term Liabilities	50737	126562	85751	33260	138648	185942
Lender Stockholder Equity	50737	95287	70034	44354	75230	123221

Notes: This table reports summary statistics for the borrower firm and lender firm control variables in the loan level sample. Variables are taken from the Compustat Fundamentals Annual NA and Global databases. Total assets, total liabilities, capital expenditures, earnings before interest and taxes (EBIT), net income, current liabilities, long-term liabilities and stockholders' equity are given in million $. Employee counts are given in thousands.

Table A5: Summary Statistics: (Conditional) Value at Risk

Variable	N	Mean	SD	P25	P50	P75
Value At Risk	2343	0.11	0.063	0.069	0.091	0.13
Conditional Value at Risk	2343	0.015	0.014	0.0048	0.012	0.019

Notes: The table shows summary statistics of (Conditional) Value at Risk, obtained from Adrian and Brunnermeier (2016). Both variables are at quarterly frequency and span the period between 1994 and 2009.

Table A6: Summary Statistics: BoardEx Compensation Data

Variable	N	Mean	SD	P25	P50	P75
Mean Total Compensation (in $1000)	1866	2513	2312	1077	1530	3190
Mean Salary (in $1000)	1866	1132	501	840	1036	1304
Mean Bonus (in $1000)	1866	1524	2363	0	449	2307

Notes: The table includes summary statistics of compensation data from BoardEx, showing averages of total compensation, salaries, and bonuses of senior non-executive bankers at the bank-year level. The data are drawn from BoardEx and span the period between 1997 and 2020.

Table A7: Effect of Outside Options on Mobility

Variable	Mean	SD	P25	P50	P75
Number of Ties	159	361	10	53	158
Quarterly Outflows	13	29	1	3	12
Workers/Firm	293	577	19	95	301
Inflows at Ties	0.11	0.15	0.029	0.073	0.15

Notes: This table reports summary statistics related to our outside options proxy $InflowsAtTies$ at the quarterly level. *Number of Ties* is the number of former coworkers at other firms in our sample that transitioned between 0.5 and 3 years ago. *Quarterly Outflows* captures worker transitions from a given firm to other firms in a given quarter. *Workers/Firm* captures the size of our worker sample of a given firm. *Inflows at Ties* shows the proxy values before normalization.

Table A8: Validation: Outside Options and Bank-Level Covariates

Estimator	Inflows at Ties	Inflows at Ties (Lead 1Y)
	Poisson	
	(1)	(2)
$\Delta lnAssets$	0.301 (0.209)	0.221 (0.194)
$\Delta lnNetIncome$	-0.002 (0.003)	0.005 (0.003)
$\Delta lnEBIT$	0.001 (0.005)	-0.0003 (0.006)
$\Delta lnCurrentDebt$	0.012 (0.008)	0.005 (0.007)
$\Delta lnLong-termDebt$	-0.031 (0.021)	0.010 (0.025)
$\Delta lnEmployees$	0.106 (0.066)	0.020 (0.065)
$\Delta lnLiabilities$	-0.060 (0.173)	0.005 (0.143)
$\Delta lnStockholders'Equity$	-0.010 (0.010)	-0.015 (0.013)
$\Delta lnCapitalExpenditures$	0.028 (0.019)	0.025* (0.014)
Observations	12,957	12,957
Lender + Year-Quarter fixed-effects	Yes	Yes

Notes: The table shows results from regressing inflows at ties on bank-level covariates, conditional on fixed effects at the lender and year-quarter level. Standard errors clustered at the lender level included in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9: Effect of Outside Options on Lender Risk – Robustness

Sample	Investment Grade Borrower							
	Full						Post 2008	Origination
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflows at Ties (Lead 4Q)	-0.004 (0.004)							
Inflows at Ties (Lead 3Q)	0.0003 (0.003)							
Inflows at Ties (Lead 2Q)	0.002 (0.004)							
Inflows at Ties (Lead 1Q)	-0.003 (0.003)							
Inflows at Ties	-0.009*** (0.003)	-0.007** (0.003)	-0.011*** (0.003)	-0.007* (0.003)	-0.008** (0.003)	-0.010*** (0.002)	-0.010*** (0.003)	-0.008** (0.003)
Inflows at Ties (Lag 1Q)	-0.002 (0.003)							
Inflows at Ties (Lag 2Q)	-0.002 (0.003)							
Inflows at Ties (Lag 3Q)	0.0007 (0.006)							
Inflows at Ties (Lag 4Q)	-0.005 (0.004)							
Number of Ties					-0.009* (0.005)			
Worker Outflows						0.0002 (0.0001)		
Borrower + Lender + Loan Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	49,625	50,426	50,574	50,528	50,579	50,579	38,788	22,979
Lender fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year-Quarter fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower Industry-Year fixed effects	No	Yes	No	No	No	No	No	No
Borrower Sector-Year fixed effects	No	No	Yes	No	No	No	No	No
Lender-Year fixed effects	No	No	No	Yes	No	No	No	No

Notes: The table reports results from robustness exercises for the results from table 3, obtained by estimating equation (8) at the loan level. The dependent variables are an indicator for investment-grade borrowers. The independent variable is our outside options proxy, inflows at ties. Borrower and lender controls are the inverse hyperbolic sine transformation of total assets, number of employees, capital expenditure, total liabilities, EBIT, and (for borrowers) fixed assets. Loan controls are the inverse hyperbolic sine transformation of tranche amount and maturity, and indicators for whether the loan is secured, and whether covenants are attached. Compared to our preferred specification (column 2 of table 3), we make the following adjustments: include four lags and leads of the explanatory variable (column 1); include fixed effects at the borrower-GICS-industry×year level (column 2); include fixed effects at the borrower-GICS-sector×year level (column 3); include fixed effects at the lender×year level (column 4); control for the number of ties of a bank (column 5); control for worker outflows (column 6); restrict the sample to the post-2008 period (column 7); restrict the sample to new originations (column 8). Standard errors are clustered at the lender level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.