BANK CULTURE AND FINANCIAL STABILITY: EVIDENCE FROM BANK LENDING CHANNELS

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Abstract

We examine the effect of bank culture on financial stability through the lens of bank lending decisions. We find that banks whose organizational culture leans towards aggressive competition are associated with riskier lending practices – higher approval rate, lower borrower quality, and fewer covenant requirements. These banks exhibit higher loan growth, but incur larger loan losses. As a result, they make greater contributions to systemic risk. The opposite behavior is observed among banks whose culture emphasizes control and safety. Our findings cannot be explained by the bank business models, CEO compensation incentives and CEO characteristics. We use the exogenous shock to the US banking system during the Russian crisis of Fall 1998 to support a causal inference.

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1. Introduction

As part of the debate on banking industry reform, the corporate culture of banks is seen by many as a root cause of excessive bank risk-taking behavior and the consequent instability in the financial system.[1] Our paper provides the first empirical evidence that tests this conjecture. We focus on a key decision-making channel through which bank culture could influence stability: bank lending. Lending decisions nearly always involve personal discretion[2] and therefore, can be heavily affected by the norms around how loan applications are processed and approved. Furthermore, lending is arguably the most important business function of a bank whose activities could directly affect individual bank risk as well as create externalities linked to financial stability and economic growth (e.g., King & Levine, 1993; Laeven & Levine, 2009). In this paper, we conjecture that a bank's culture affects its willingness to take risk in approving and setting-up loan contracts, which, in turn, affects individual bank risk and systemic risk.

Drawing on the recent literature on corporate culture (Fiordelisi & Ricci, 2014; Fiordelisi, Raponi, & Rau, 2016; Thakor, 2016), our measure of corporate culture is based on the Competing Value Framework (CVF) developed by Quinn and Rohrbaugh (1983). The CVF identifies four corporate culture dimensions: *compete, create, control* and *collaborate*. Under the CVF, these four cultural dimensions compete for a company's limited financial, time and human resources. For instance, if a firm's priority is to train and nurture its employees, it may

[1] At the Workshop on Reforming Culture and Behavior in the Financial Service Industry, the president and chief executive officer of the Federal Reserve Bank of New York made a remark that the financial industry loses public trust not because of a few "rogue traders", but because of the culture of the firms. Similarly, the Dutch Central Bank argues that the key to preventing financial crises and misconduct scandals may not be stricter regulations but to oversee culture and behavior (De Nederlandsche Bank, 2015). The UK's Financial Conduct Authority planned to conduct a review on bank culture that is believed to contribute to a string of recent banking scandals (see "UK draws line under "banker bashing" after scrapping assessment" in *Financial Times*, 30 December 2015).

[2] Although some parts of the lending process are automated, lending decisions need to be approved by credit officers and therefore, are subjected to discretion. The prior literature documents that lending outcomes can be determined by various characteristics of the credit officers, including their psychological factors such as mood or emotional state (e.g., Cortes, Duchin, & Sosyura, 2016), compensation incentives (e.g. Cole, Kanz, & Klapper, 2015), or career concerns (Filomeni, Udell, & Zazzaro, 2016; Tzioumis & Gee, 2013).

need to sacrifice other objectives such as maximizing sales. How the firm responds to the tension created by these competing values shapes its culture and, ultimately, the way people in the firm behave.

[Figure 1 about here]

Figure 1 summarizes the attributes of these four cultural orientations. Two cultural orientations – create and compete – share an external focus and place an emphasis on risk-taking, adaptability, competitiveness, and aggressiveness. *Compete-oriented* firms embrace risk-taking through aggressive competition and focus on customer demand. Value drivers of compete-oriented firms are market share, goal achievement, and profitability. *Create-oriented* firms, while embracing risk-taking, focus on innovation, vision, and constant change. Their value drivers are innovative outputs, transformation, and agility.

The other two cultural orientations – collaborate and control – share an internal focus and place an emphasis on predictability, conformity, and compliance. These two dimensions can be seen as less focused on risk-taking. *Control-oriented* firms achieve predictability through a focus on control, efficiency, and process capability. Their value drivers are conformity, compliance, and timeliness. *Collaborate-oriented* firms achieve predictability through harmony of people within the organization. They focus on human development and commitment, and the value drivers of these organizations are commitment, communication, and development of their human capital.

We predict that different cultural orientations have implications for the bank's willingness to take risk in approving and setting-up loan contracts. Lending is a source of revenue and growth characterized by high risk and uncertainty. Therefore, we hypothesize that banks with an external focus (compete and create) are more aggressive in granting loans to clients in exchange for revenue and growth. That is, loans made by these banks are characterized by higher approval rate, lower credit quality of borrowers, fewer covenant

requirements, and higher loan spreads. In contrast, loans made by banks with an internal focus (control and collaborate) should reflect the opposite characters. To test this hypothesis, we focus on two key lending channels: (1) corporate lending (syndicated loans) and (2) retail lending (mortgage loans).

To measure corporate culture, we perform textual analysis to analyze the 10-K reports of all publicly-listed US banks (see Fiordelisi, Raponi, & Rau (2016), Fiordelisi & Ricci (2014), Moniz (2016), Popadak (2013) for similar approaches). The premise of textual analysis is that the words used in annual reports mirror the corporate culture that a company has developed over time. We first identify a set of keywords used to measure each cultural dimension and compute the frequency that each set of words appears in the annual reports. We then transform these scores to identify the dominating culture in a given bank.[3]

Our analysis begins with the corporate lending market. We use the credit ratings of a bank's borrowers to measure bank risk-taking in lending. Credit ratings reflect the borrower's creditworthiness and ability to repay loans and therefore, are key inputs banks use to evaluate their borrowers.[4] Consistent our hypothesis, we find that banks with an external focus are more likely to have borrowers having poorer credit ratings, while those with an internal focus are less likely to do so, with the effects concentrated on compete- and control-dominant banks. Specifically, borrowers of compete-dominant banks are 2.9% more likely to be sub-investment grade borrowers (or "risky borrowers", defined as unrated borrowers or those rated below

[3] This is to account for the fact that while all aspects of the four cultural dimensions can co-exist in a given bank in a given year, only one (or at most two) would persistently dominate to represent a bank's core, long-term corporate culture. We follow the extant literature to identify dominating culture. Specifically, a bank is classified as having a compete-dominant culture if the frequency of words associated with compete culture is in the top quartile relative to other banks in more than half of its sample observations. Other cultural dimensions (create-dominant, control-dominant, and collaborate-dominant) are constructed in a similar way. Our results are robust to various thresholds of how a dominant culture is defined.

[4] Relative to other proxies for borrowers' creditworthiness, credit ratings offer three major advantages. First, it encapsulates both quantitative (e.g., financial health) and qualitative (e.g., management quality) aspects of borrowers. Second, it is easily observable. Third, it is decided by an independent credit rating agency and thus, is difficult to be manipulated by the borrower. Our results are robust to alternative definitions of the borrower's riskiness.

BBB), while borrowers of control-dominant[5] banks are 7.0% less likely to have sub-investment grade ratings. Importantly, our findings are robust to controlling for traditional characteristics of a bank's business model (e.g., size or leverage), CEO compensation incentives (e.g., equity or bonus payments) and CEO characteristics (e.g., demographic, education or career history).

While we control for a host of variables, unobserved heterogeneity (e.g., the location where loans are decided) that correlates with our measure of bank culture and the bank's lending decisions could still bias our estimates. To alleviate these concerns, we examine the reactions of US banks to the Russian Crisis of Fall 1998. When the Russia government defaulted its sovereign debt obligations, many US banks that were exposed to Russia experienced massive losses during a short period of time (Gatev, Strahan, & Schuermann, 2009). The negative sentiment generated from this event also triggered unexposed US banks' reevaluation of their risk-return trade-offs and refrain from taking excessive risk (Chava & Purnanandam, 2011). To the extent that a bank's culture matters to its risk-taking behavior, we should observe heterogeneous reactions across banks with different cultures. Specifically, the effect of this negative sentiment should be more evident among compete-dominant banks and should cause them to significantly, despite briefly, refrain from lending to risky borrowers.[6]

Further, since this default event is exogenous to the US economy (Chava & Purnanandam, 2011), it also isolates the bank's willingness to lend from the borrower's decision to apply for a loan or its choice of the lender. Therefore, changes in lending behavior after the event can be attributed to the lender and not the borrower.

We examine the relation between a bank's culture and its propensity to lend to risky borrowers in short periods of up to five months surrounding the Russian Crisis in 1998. We

[5] We find that "create-dominant" banks tend to be riskier and "collaborate-dominant" banks tend to be more prudent, but to a lesser extent than "compete-dominant" and "control-dominant" banks.

[6] This idea could be seen as analogous to a traffic accident. When observing a fatal accident on the road, a reckless driver is likely to be concerned and drives more carefully. However, this effect is likely to be short-lived and would not permanently make him a cautious driver.

take care to restrict our sample to banks and borrowers *unexposed* to Russia in 1998 and thus, only affected by the negative sentiment. Consistent with our expectations, we find that compete-dominant banks are less likely to lend to risky borrowers after the default announcement, compared to the period before the announcement. In contrast, banks with other culture do not adjust their lending behavior. This supports the interpretation that the culture of banks can influence their willingness to absorb credit risk in making lending decisions.

Another concern arising from using the corporate loan data to infer risky lending is that we can only observe the approved applications but not the rejected ones. Our results, therefore, could reflect the fact that borrowers do not randomly choose a bank to apply for loans and, thus, there could be unobserved heterogeneity that simultaneously affects the borrower pool and our bank culture measure. To alleviate this concern, we rely on a sample of retail mortgage loans where the complete pool of applicants can be observed. Our measure of risk-taking in making mortgage loans is the fraction of approved loans divided by the total number of applications, allowing us to utilize the entire pool of mortgage applications. Holding other factors constant, a higher approval rate indicates that the bank is more willing to consume default risk. Consistent with our expectation, we find that compete-dominant banks are associated with significantly higher mortgage approval rate, while control-dominant banks have a lower approval rate.

We further show that bank culture also affects the terms of bank loans. Consistent with our expectations that compete-dominant banks are more willing to assume default risk in exchange for revenues, we find that they require significantly fewer covenants from their borrowers, while charging them a higher loan spread. In contrast, in line with their focus on post-lending safety, control-dominant banks require their borrowers to meet significantly more

covenant conditions, especially when the borrower is risky (i.e., unrated or rated below BBB).[7] Overall, our findings are consistent with a bank's culture influences how it trade-offs between lending standards and revenue.

We next examine whether the differences in lending practices driven by different cultural orientations affect the individual bank risk and systemic risk. We find that compete-dominant banks enjoy a significantly higher level of loan growth compared to other banks, especially when the industry is in its normal (i.e., non-distress) stage. This higher level of growth, however, comes at the expense of a significantly higher fraction of bad loans, especially when the industry turns into distress. This implies that the growth during good times overshadows the potential downside of risky lending, and compete-dominant banks only realize the consequences of their risky lending when the entire industry is in distress.[8] In contrast, control-dominant banks enjoy a significantly lower level of non-performing loans, especially when the industry is in distress. Thus, their focus on safety pays off in periods of distress.

In the final part of the paper, we link bank culture to financial stability. A bank's lending activities could affect industry-wide stability if the bank incurs bad loans and does not have sufficient capital buffer to offset the losses. To avoid a liquidity dry-up, the bank may be forced to borrow more heavily from the interbank funding markets and thus, create large risk spillovers to the financial system. We find that compete-dominant banks, while suffering from a higher level of bad loans, maintain a lower level of capital cushions (Tier-1 Capital). As a result, they make significantly greater contributions to the tail risk of the financial system (measured using ΔCoVaR[9] developed by Adrian and Brunnermeier (2016)). On the other hand, the contributions

[7] We find evidence that create- and collaborate-dominant banks behave in a similar way to compete- and control-dominant banks, respectively.

[8] Consistent with this, we also find that compete-dominant banks halt their lending to risky borrowers following industry distress.

[9] $\Delta CoVar$ measures the estimated change in Value-at-Risk (VaR) of all financial institutions (systemic VaR) when the institution's in Value-at-Risk changes from its normal state to its distress state. Essentially, it measures the extent to which the distress of a financial institution contributes to the tail risk of the financial system.

of control-dominant banks to systemic risk are significantly lower. Overall, we show that bank culture matters to financial stability through bank lending and capital structure channels.

Our paper contributes to several active research areas. First, to the best of our knowledge, this paper provides the first empirical evidence on the link between the corporate culture of individual banks and the stability of the financial sector. The results of our paper are likely to be of interest to financial regulators, policy-makers, and banks. We focus primarily on lending decisions – those that require substantial discretion – and document micro-level evidence on how organizational culture influences bank behavior, individual bank risk, and systemic risk.

Second, we contribute to the literature on corporate culture. Although corporate culture is anecdotally considered to be an important determinant of firm behavior, empirical works in accounting and finance in this area are still limited, mainly due to challenges in measuring corporate culture. Unlike prior works, which infer a firm's culture indirectly from employee surveys (Guiso, Sapienza, & Zingales, 2015; Popadak, 2013) or CEO characteristics (Liu, 2016), we use textual analysis to identify corporate culture for all publicly-listed US banks. We show that the influence of corporate culture on bank lending transcends traditional characteristics of a bank's business models, CEO compensation incentives and CEO characteristics. This is consistent with the notion of corporate culture as an "invisible hand" that influences how a bank operates and is in line with the call from regulators to look beyond observable factors such as CEO pay in studying bank behavior.

Finally, we contribute to the literature that explores the determinants of bank risk-taking. Rather than using aggregate risk measures such as Z-score, volatility or tail risk (Adams & Ragunathan, 2015; Ellul & Yerramilli 2013; Minton, Taillard, & Williamson 2014) or adverse outcomes such as loan defaults or regulatory sanctions (Ho et al., 2016; Nguyen, Hagendorff, & Eshraghi, 2016), we focus on the bank's risk-taking in making lending

decisions. Given the significance of bank credits to the economy, it is especially important to understand factors that influence the allocation and quality of bank credits. We contribute by identifying the corporate culture of banks as a new factor that influences lending decisions.

2. Literature and hypothesis

We hypothesize that the corporate culture of banks matters to their lending decisions. Despite advances in credit-scoring technology, credit decisions remain by and large activities that require substantial human inputs (Brown et al., 2012; Campbell, 2012; Filomeni, Udell, & Zazzaro, 2016). For instance, in order to make approval decisions, credit officers need to evaluate borrowers' soft information, such as the quality of their management team or the likelihood that their research and development activities will materialize and lead to profitability. Such decisions are inherently complex, subjective and therefore, cannot be regulated ex ante.[10] To cope with such subjectivity, credit officers would need to look for guidance within their own bank on what constitutes appropriate lending decisions (Rojot, 2009). Such guidance could come from explicit communications and incentives from the top or can be shaped by implicit learning from the work environment. This allows for the possibility that corporate culture, the "collective programming of the mind" of people in an organization (Beach & Connolly, 2005; Hofstede, 1991), could influence the way lending decisions are made.

Drawing on the recent literature on corporate culture (Fiordelisi, Raponi, & Rau, 2016; Fiordelisi & Ricci, 2014; Thakor, 2016), our measure of corporate culture is based on the Competing Value Framework (CVF). The CVF originates from the work of Quinn and

[10] Consistent with this, an emerging literature has documented that lending decisions can be influenced by various characteristics of the credit officers, including psychological factors such as mood or emotional state (e.g., Cortes, Duchin, & Sosyura, 2016), compensation incentives (e.g. Cole, Kanz, & Klapper, 2015), or career concerns (Filomeni, Udell, & Zazzaro, 2016; Tzioumis & Gee, 2013).

Rohrbaugh (1983) and is further developed by Cameron et al. (2006). Under the CVF, corporate culture is classified into four quadrants: compete, create, control, and collaborate. Each of these cultural quadrants is associated with different corporate orientations, value drivers and effectiveness criteria as shown in Figure 1.

The *create* and *compete* cultural dimensions share an *external* focus. Firms that belong to these two quadrants place an emphasis on risk-taking, adaptability, competitiveness, and aggressiveness. Firms in the *compete* dimension typically compete aggressively with speed being an essential factor in maintaining the firm's competitive advantage. The mantras of this quadrant are: "compete hard, move fast, and play to win". Specifically, market share gains and growth in profitability are among the major indicators of the success of firms in this cultural dimension. In contrast, the *create* cultural dimension has a mantra of "create, innovate, and envision the future". Organizational effectiveness of create-oriented firms is associated with entrepreneurship, vision and continuous change, aimed at developing new technologies, innovative product-line extensions, and radical new process breakthroughs.

The *collaborate* and *control* cultural dimensions share an *internal* focus. Firms that belong to these two dimensions place an emphasis on risk-taking, adaptability, competitiveness, and aggressiveness. Firms in the *control* dimension might be best reflected by the mantra of being: "better, cheaper, and surer". Organizational effectiveness of these firms is associated with capable processes, substantial predictability and control. Firms in the *collaborate* dimension are associated with the mantra of "human development, human empowerment, human commitment" which determine the effectiveness and success of an organization. Activities anchored in the *collaborate* quadrant generate the most value when "stability must be maintained in the face of uncertainty" (Cameron et al., 2006).

How does a bank's corporate culture influence its lending decisions? In lending to clients, banks consume various types of risk, most notably default risk, in exchange for

revenues, market share and growth. Default risk is a major concern for banks because it renders the bank's ability to recover the principal and interest payments. As a result, banks will not lend to marginal borrowers whom they deem unable to repay the loans.

This threshold of accepting marginal borrowers varies across banks depending on a number of factors, including the bank's corporate culture. In theoretical models developed by Song and Thakor (2016), banks face an inherent choice between growth and safety. Building on this work, we hypothesize that compete-dominant banks are most willing to consume credit risk in making lending decisions in exchange for immediate growth and revenues. In contrast, control-dominant banks focus on safety and therefore, will be least willing to take risks in making lending decisions even if this comes at the expense of slower growth. The prediction is less clear for create- and collaborate-dominant banks. We hypothesize that create-dominant banks share some similar lending behavior with compete-dominant banks as they both share an external focus, while collaborate-dominant banks will behave similarly to control-dominant banks.

Hypothesis 1A: Banks with compete- and create-dominant cultures are *more* likely to take risks in making lending decisions

Hypothesis 1B: Banks with control- and collaborate- dominant cultures are *less* likely to take risks in making lending decisions

3. Data and variables

3.1. Measuring bank corporate culture

In order to measure Cameron et al.'s (2006) four dimensions of corporate culture (*compete*, *create*, *control* and *collaborate*), we use textual analysis to capture the characteristics specific to a text. Our text analysis is motivated by the idea that the words and expressions used by

members of an organization reflect the culture that they develop over time (Levinson, 2003). [11] The set of keywords used for measuring each cultural dimension is from Fiordelisi and Ricci (2014) and is provided in Figure 2. Fiordelisi and Ricci (2014) compile a large set of synonyms for each cultural dimension from those described in Cameron et al. (2006) and the Harvard IV-4 Psychosocial Dictionary.[12] For example, words like "fast, expand, performance, and win" are to be associated with compete, words like "envision, freedom, and venture" are to be associated with create, words like "cooperate, human, and partner" are to be associated with collaborate and words like "monitor, competence, and long-term" represent control.

[Figure 2 about here]

We first download 10-K reports from the Edgar website (www.sec.gov) for all listed US banks over the period 1993-2007 (1993 is the earliest year for which 10-K reports are available and 2007 is the final year the Dealscan version we have access to). We include one filing per bank per calendar year. We use the bag of words method that requires us to parse the 10-K reports into vectors of words and word counts (excluding tables and exhibits). The score of each cultural dimension is the frequency of its synonyms scaled by the total number of words in the annual report. For instance, if 634 compete-related synonyms are mentioned in a 27,110-word annual report, the *compete* measure would be 2.34%.

While informative, these scores need to be interpreted with caution. For example, they could be subjected to specific events occurring to the bank or the industry in a given year and, therefore, may fluctuate over time. These fluctuations are temporary and do not necessarily reflect a bank's long-term corporate culture. Furthermore, while aspects of all four cultural

[11] Our approach is similar to Fiordelisi and Ricci (2014). Most of the prior works use annual rankings of companies or employee surveys (see e.g. Bargeron, Lehn, & Smith, 2015; Guiso, Sapienza, & Zingales, 2015). These measures, however, suffer from a number of shortcomings. First, firms pay to participate in the survey and therefore, have the incentive to manipulate the survey responses, resulting in significant measurement errors. Second, these surveys are restricted to a small subset of very large firms, making result generalization difficult (see the reviews by Moniz (2016))

[12] The Harvard IV-4 Psychosocial Dictionary is a commonly used source of word classification, in part because its composition is beyond the control of the researcher and the possible impact of research subjectivity is significantly reduced (Loughran & Mcdonald, 2011).

dimensions could co-exist in any organization, only one or two dimensions typically dominate.[13] This implies that the raw cultural scores can be noisy. In the next two steps, we transform the raw scores into measures that reflect the dominating and stable culture of a firm.

In the first step, we compare each bank's cultural scores in each year to those of other banks in the same year. This step takes into account the fact that the raw cultural scores can be affected by common events occurring to all banks and thus, can affect the frequency of cultural keywords of all annual reports in a similar way. It also alleviates the concern that some words are more common in the English dictionary, causing some cultural dimensions to systematically appear more frequently in annual reports compared to others. Therefore, to be classified as having a dominating culture, a bank's cultural score must be one of the highest relative to other banks in the same year. Specifically, we define *compete-year-dominant* as a dummy variable that equals one if a bank's *compete* score is in the top quartile among all banks for that year, and zero otherwise. The same definition applies for the other three cultural measures.

However, this measure is still subjected to time-series noises that could result in classification errors. For instance, over the period 1993-1997, the frequencies of Whitney Holding Company's compete-related keywords are in the 72^{nd}, 76^{th}, 71^{st}, 79^{st} and 77^{th} percentile relative to other banks. This results in the bank being classified as compete-dominating in 1994, 1996, and 1997 but not in 1993 and 1995 when, in fact, the bank appears to have had a relatively stable competitive culture throughout the period. Therefore, in the second step, we construct four measures of time-invariant dominant culture for each bank: *create-dominant*, *compete-dominant*, *control-dominant*, and *collaborate-dominant*. A bank is considered to be *compete-dominant* if more than half of its sample observations are classified as *compete-year-dominant*. We use the same approach to identify *create*, *collaborate* and *control* cultural dimensions.

[13] This is analogous to human personality. A person can either be an introvert or an extrovert but rarely both. Further, although extroverts would spend most of their time mixing with the crowd, they may occasionally prefer to spend some quiet time alone.

Overall, our measure reflects the fact that a bank's dominating culture tends to be stable over time. This is consistent with the evidence in Graham et al. (2016), in which corporate executives comment that "culture is always longer term because that is the code/behavior of the company", or in Fahlenbrach, Prilmeier and Stulz (2012) where banks are found to have very persistent risk culture. We recognize that there could be occasions when a bank permanently alters its stable culture, such as when it has a new CEO with an entirely different management style. Therefore, we perform various sensitivity tests where we relax the assumptions and thresholds imposed in this section and find that our results remain consistent. Finally, it is worth noting that a bank can be classified as having no dominant culture or having two dominant cultures, although the latter case is rare.

3.2. Sample construction

We obtain data on loan contracts from LPC-Reuter's Dealscan database. The Dealscan database includes both price and non-price terms of the loans. Our loan sample includes all dollar-denominated loans made by US lenders to US borrowers. Dealscan does not provide identifiers that allow us to trace a lender back to its holding company. Therefore, we hand-clean the lender's name to locate their holding company. Some loan packages or deals consist of several facilities for the same borrower. Following Faleye and Krishnan (2015), we collapse the loan data to bank-borrower-year level.

[Table 1 about here]

We next merge the Dealscan data with the commercial banks and bank holding company call reports (FFIEC 031/041 and FR Y-9C) to obtain financial information on the banks. We then merge the dataset with our culture variables using the PERMCO-RSSD link table from Federal Reserve Bank of New York. In the final step, we merge the dataset with the Compustat database using the link table from Chava and Roberts (2008) to obtain financial

information on the borrowers. Our final sample comprises 658 bank-years for 79 unique banks that lend to 5,482 unique borrowers between 1993 and 2007. Pane A of Table 1 provides descriptive statistics of borrowers and banks in our sample. Panel B of Table 1 provides a snapshot of top-ranked banks under each cultural dimension.

4. Corporate culture and bank credit decisions

Our first goal is to establish the link between the corporate culture of banks and the credit quality of their approved borrowers. For this purpose, we define risky borrowers as those having non-investment grade credit ratings, i.e., those who do not have a long-term Standard and Poor's credit rating or its credit rating is rated BB+ or below.

Our empirical model is as follows:

$$\Pr(\text{Risky borrower}_{i,t}) = \Phi(\alpha_0 + \alpha_1 \times \textit{Compete-dominant}_i + \alpha_2 \times \textit{Create-dominant}_i + \alpha_3 \times \textit{Control-dominant}_i + \alpha_4 \times \textit{Collaborate-dominant}_i + \mathbf{X}_{i,t}\boldsymbol{\Gamma} + \varepsilon_{i,t}) \quad (1)$$

The dependent variable *Risky borrower* is a dummy variable that equals 1 if the borrower does not have a long-term Standard and Poor's credit rating or its credit rating is rated BB+ or below. Credit rating is a handily observable proxy that measures a firm's credit worthiness and predicts its likelihood of default. Relative to other proxies, such as borrower's size, profitability or Z-score, credit rating is more informative as it encapsulates both quantitative (e.g., financial health) and qualitative (e.g., management quality, relationships with suppliers and customers, or any lien and judgements filed against the borrower) aspects of the borrower. Thus, the credit ratings of borrowers are likely to be used by banks in making lending decisions. In approving loans requested by non-investment grade borrowers, the bank is willing

to assume significant credit risk. Therefore, this variable reflects the bank's propensity to take risk in issuing loans.

The four key independent variables are the four CVF cultural dimensions. As some banks in our sample are classified as having no dominant culture, the four coefficients represent the difference between banks with a dominant culture and those without culture.

The vector **X** represents the control variables. To isolate the impact of corporate culture from traditional determinants of a bank's business models, we control for several bank characteristics. These include bank size, charter value, leverage and return on assets. To control for the possibility that banks rely on other information apart from the borrower's credit rating in making lending decisions, we include several characteristics of borrowers in our empirical model. These include borrower size, market-to-book ratio, leverage and return on assets.

In addition, several loans characteristics are included: *Ln (Deal amount),* the natural logarithm of the loan's deal amount and *Ln (Loan duration),* the natural logarithm of maturity period. We also control for qualitative factors that could affect lending outcomes*: relationship lending*, a dummy that equals 1 if the borrower has taken out a prior loan from the bank in the last three years; and *same culture*, a dummy variable that equals 1 if the borrower and the lender have similar dominating corporate culture.[14] All regressions include year, borrower's SIC-2 industry and borrower's state fixed effects, allowing us to control for differences in loan characteristics across time, industries and states. All test statistics are computed based on robust standard errors clustered at the borrower-level.

[Table 2 about here]

Table 2 presents our baseline estimation results. Columns 1-4 separately relate each corporate cultural measure to borrower's quality. Consistent with our hypothesis, we find that banks with an external focus are more likely to have borrowers with poor credit ratings, while

[14] We use the same textual analysis approach to identify the corporate culture of borrowers in our sample.

those with an internal focus are less likely to do so, with the effects concentrated on compete- and control-dominant banks. Specifically, borrowers of compete-dominant banks are 2.9% more likely to be considered risky (i.e., unrated or rated BB+ or below) compared to borrowers of banks with no dominant culture. In contrast, borrowers of control-dominant banks are 7.0% less likely to be risky borrowers. These magnitudes are economically important, and have a greater impact on the quality of the borrower than those of other bank characteristics, including size (0.5%), charter value (2.7%), or profitability (2.4%). We do not find the coefficients for collaborate-dominant and create-dominant to be statistically significant.

Column 5 shows the estimation results when all corporate cultural measures are included in the same regression specification. We find the coefficient estimates in this column to be very similar to those reported in Columns 1 to 4, suggesting that our corporate culture measures are highly orthogonal to each other. The control variables have the expected signs. Borrowers of small, profitable and highly-leveraged banks are more likely to be risky, consistent with these banks adopting expansionary business strategies. This highlights the importance of controlling for these bank characteristics to separate a bank's culture from characteristics reflecting its business strategies.

Overall, the above evidence confirms our hypothesis that banks with a compete-dominant culture tend to take on more risk in lending while those with a control-dominant culture do not appear to do so. The effect is robust to controlling for a host of business model related characteristics, implying that bank culture has a first-order effect on risk-taking in lending.

4.1. Robustness checks

Table 3 reports various robustness checks on the relation between a bank's culture and its borrower's credit quality. We start by evaluating the sensitivity of our results to alternative cut-off points in defining corporate culture. For each of relaxation we impose, we keep other criteria

fixed as in the baseline. We first relax our "dominating" threshold. In the baseline model, a bank-year is defined to be *compete-year-dominant* if its raw compete score is in the top 25% among all banks for that year. For robustness, we reclassify a bank-year to be *compete-year-dominant* if its raw compete score is in the top 10% (instead of 25%) among all banks for that year. Next, we alternatively relax our "time-invariant" threshold by requiring a bank to have at least 67% (instead of 50%) of the number of years classified as *compete-year-dominant* to be considered *compete-dominant.* Finally, we relax the assumption that a bank's dominating culture is stable over its entire presence in the sample. There could be occasions when a bank permanently alters its stable culture, such as when it has a new CEO with a completely different management style. Therefore, instead of classifying time-invariant culture per bank, we classify it per bank-CEO. That is, a given bank under a given CEO is classified as having a *compete-dominant* culture if it is classified as *compete-dominant-year* in more than half of the CEO's tenure.

[Table 3 about here]

Panel A of Table 3 reports the results. For comparison purposes, Column 1 of Panel A reports our baseline results using the original cut-off points, while Column 2 reports the results using the 10% cut-off for dominating culture, Column 3 uses the 67% cutoff for time-invariant culture, and Column 4 classifies time-invariant culture per bank-CEO. The results are robust across all columns, asserting that our estimation is not sensitive to specific cut-off points in defining corporate culture. Interestingly, as shown in Column 2 of Panel A, the estimated coefficients using the 10% threshold are larger than those estimated in the baseline regressions using the 25% threshold. This reflects a stronger manifestation of culture to affect risk-taking from a more strongly dominated culture.

In Panel B, we address an important concern that our measure of corporate culture simply reflects the compensation incentives and characteristics of the leader of an organization,

i.e., the CEO. For instance, if compete-dominant banks are more likely to pay their CEOs more incentive-based compensation and if these incentives are linked to lower borrower quality, our results simply reflect this omitted factor. To address this concern, we control for CEO compensation incentives: the fraction of bonus pay (bonus/salary) and the fraction of equity pay [equity/(bonus+salary)]. We also control for various observable CEO characteristics: the age of the CEO, whether the CEO is a graduate of an Ivy League university, or whether the CEO has prior work experience as a top executive.[15]

As shown in Columns 1 and 2 of Panel B, our results are robust to controlling for these additional factors. Thus, two seemingly similar banks (that is, banks adopt similar business model, give comparable compensation incentives to their CEOs, and hire CEOs that are similar in terms of demographics, education and career history) can have different levels of risk-taking in making lending decisions depending on their culture. This implies that culture is an "invisible hand" that influences bank behavior and is in line with the calls from regulators to look beyond observable factors such as CEO pay in studying bank behavior.

In Panel C, we construct various other robustness tests. First, instead of clustering the standard errors at the borrower-level, we cluster them at the bank-year and borrower-year level. As shown in Columns 1 and 2, our results are robust to how the standard errors are clustered. Furthermore, loans can have different types and purposes, which may affect the probability of being approved. Following Giannetti and Yafeh (2012), we include in the regressions additional dummy variables for loan types and loan purposes (Column 3) and find that our results continue to hold.

We further alternate our regression specifications by excluding unrated borrowers from the sample. The new dependent variable equals 1 for sub-investment grade borrowers (BB+

[15] Due to data limitation, we cannot control for the compensation incentives and characteristics of all workers in the bank. However, their pay and characteristics should mirror those of the CEO – the leader of the organization.

rating and below) and 0 otherwise. As shown in Column 4, the coefficients for compete-dominant and control-dominant remain significant and have the same sign as in the baseline results. We also find in this result that the coefficient for create-dominant becomes positive and statistically significant. This suggests that create-dominant banks are also inclined to make sub-investment lending, but refrain from lending to unrated borrowers – the riskiest borrowers. This result indicates similarities in behavior between banks with create and compete cultural orientation, both of which are on the external focus quadrants of the CVF.

Next, there can be a concern that our results are driven by a subset of very large banks, i.e., those with a "too-big-too-fail" attitude and thus, are more prone to take risks (Stern and Feldman, 2004). To address this, we exclude the top-five largest banks (ranked by assets at the end of 2007)[16] from the sample. As shown in Column 5, our results remain robust.

Finally, there are several mergers and acquisitions (M&A) taking place during the sample period and this may add noise to our cultural measures. Specifically, the 10-K reports of both the acquirer and the target may be dominated by information about the M&A deal and therefore, they may not necessarily reflect the banks' cultural values. We thus exclude the years during which the merger takes place and display robust results in Column 6.[17]

4.2. Endogeneity of bank culture measures

So far, we have presented robust results that borrowers of compete-dominant have poorer credit ratings while borrowers of control-dominant banks have better credit ratings. These findings are consistent with the view that different cultural orientations influence the bank's willingness to absorb default risk from borrowers. However, our results are still subject to endogeneity concerns. First, the coefficient estimates can still be biased if there are unobserved factors that are correlated with both our measures of bank culture and borrowers' quality. The second

[16] Our results are also robust to excluding the top-ten largest banks.
[17] We obtain M&A data from Thomson Financial's merger database (SDC).

concern is that, since we can only observe the approved applications but not the rejected ones, our results could reflect the fact that borrowers do not randomly choose a bank to apply for loans and thus, there can be unobserved heterogeneity that simultaneously affects the borrower pool and our bank culture measure. To alleviate these concerns, we examine the change in lending behavior around the Russian Crisis of Fall 1998.

This Russian Crisis starts with an announcement of the Russian government to default its sovereign debt obligations on the 17th August 1998 (Kho, Lee, & Stulz, 2000). This was followed by the suspension of Ruble trading on 28th August 1998 and the massive capital flight from Brazil on 3rd September 1998. Many US banks that have dealings with these countries experienced significant losses, liquidity constraint and worsened stock performance. Gatev, Strahan, & Schuermann (2004) show that bank stocks perform very poorly during this period, losing 10% of market capitalization in a short window.

Crucially, this event also generated an industry-wide negative sentiment, causing *unexposed* US banks to re-evaluate their risk-return trade-offs and refrain from taking excessive risk (Chava & Purnanandam, 2011). To the extent that a bank's culture matters to its willingness to take risk in approving loans, we should observe heterogeneous reactions across banks with different cultures. Specifically, the effect of this negative sentiment should be most evident among compete-dominant banks – those traditionally more prone to taking risks – and should cause them to significantly refrain from issuing loans to risky borrowers.[18] Alternatively, if a bank's culture is unrelated to its lending decisions, all banks should exhibit similar changes in lending (or lack thereof) after the shock.

Importantly, since this default event is exogenous to the US economy (Chava & Purnanandam, 2011), it also isolates the bank's willingness to lend from the borrower's

[18] This idea could be seen as analogous to a traffic accident. When observing a fatal accident on the road, a reckless driver is likely to be concerned and drives more carefully. However, this effect is likely to be short-lived and would not permanently make him a cautious driver.

decision to apply for a loan or its choice of lender. Therefore, changes in lending behavior after the event can be attributed to the lenders and not borrowers.

We construct a difference-in-difference test to examine changes in lending behavior of banks with different culture before and after the Russian default event. In line with the idea that the Russian event only produced a temporary, short-term negative sentiment rather than creating a permanent, long-term effect, we focus on short-term windows of three, four and five months surrounding the event (i.e., from April 1998 to December 1998). To ensure that our coefficients pick up the negative sentiment effect, we take care to drop all banks and borrowers that had direct dealings with Russia and Brazil during this period.[19] That is, we focus on the lending behavior of *unexposed* US banks and borrowers. Our coefficients of interest are the interaction terms between the bank culture variables and *Post-Russian default*, a dummy variable that equals one for all months from August 1998.[20]

[Table 4 about here]

Table 4 reports the results. Across all three event windows, only the coefficient estimates for *Compete-dominant*Post-Russian default* are negative and statistically significant. That is, compete-dominant banks are most affected by the negative sentiment linked to excessive risk-taking and refrain from issuing loans to risky borrowers as a result. On the other hand, banks with other cultural orientations do not exhibit any change in lending. Overall, this set of results supports our conjecture that a bank's culture explains its lending behavior.

We further address the concern that there can be unobserved heterogeneity that simultaneously affects the borrower pool and our measures of bank culture. This arises from

[19] Following Chava and Purnanandam (2011), we obtain geographic segments of banks and borrowers from the Compustat Geographic Segments file and exclude those that report any business activity in Russia, Brazil, Europe, Eurasia, Eastern Europe, or South America.

[20] Because the magnitude of the interaction terms could have the opposite sign from the marginal effects (Ai & Norton, 2003), we take care when interpreting the interaction term in nonlinear model. For all interaction terms reported in this paper, we interpret its statistical and economic significance using the methodology developed by Norton, Wang and Ai (2004).

the fact that in the Dealscan sample, we can only observe the approved applications but not the rejected ones. Therefore, our results could reflect the fact that borrowers do not randomly choose a bank to apply for loans and thus, there could be unobserved heterogeneity that simultaneously affects the borrower pool and our bank culture measure. To alleviate this concern, we rely on an alternative sample of retail mortgage loans where the complete pool of applicants can be observed.

We obtain data on mortgage application from the Home Mortgage Disclosure Act (HMDA) Loan Application Registry. Following the extant literature (e.g., Cortes, Duchin and Sosyura, 2016), our measure of risk-taking in making mortgage loans is the fraction of approved loans divided by the total number of applications, allowing us to utilize the entire pool of mortgage applications. Holding other factors constant, a higher approval rate indicates that the bank is more willing to consume default risk.

To test our hypothesis, we regress *Loan Approval Rate* on the four corporate culture measures. We aggregate the data to the bank-county-year level. All models include county-year fixed effects, which control for omitted demand-side variables that could affect the lending behavior of all banks within a given county-year. Essentially, our regressions are identified through variation between banks with different corporate culture within a given county in a given year. In addition, we control for various bank characteristics (size, leverage, profitability, and charter value) and characteristics of the loan applications reviewed by a given bank on a given county-year (applicant's income, fraction of female applicants, fraction of minority applicants). Standard errors are clustered by county. The results are reported in Table 5.

[Table 5 about here]

As shown in Table 5, *compete-dominant* banks are associated with an 11 basis point higher loan approval rate while *control-dominant* banks are associated with an 18 basis point

lower approval rate. Relative to the average approval rate of 66%, these estimates correspond to economically significant marginal effects of 17% and 27%, respectively. Overall, the results indicate that a bank's culture affects its approval decisions, in addition to affecting its borrower's credit quality. This alleviates the concerns over borrower-bank matching and corroborates our hypothesis.

4.3. Bank culture and loan contract terms

So far, we find that the corporate culture of banks affects approval decisions, i.e., whether loans are approved and whether they are extended to marginal borrowers. In this section, we extend our analysis to investigate whether a bank's culture also affects the terms in the loan contracts. We expect compete-dominant banks – whose culture focuses on revenues and growth – to be more likely to undermine post-lending safety and impose less stringent loan terms in exchange for higher loan spreads. In contrast, control-dominant banks would exercise precaution and impose more covenant conditions on their borrowers.

We regress the number of covenants and loan spreads (the natural logarithm of drawn all-in spread) on the culture variables. We include the same set of control variables and fixed effects as those in Equation 1. As loan spreads and covenants are often simultaneously decided, we include loan spreads in the covenant regressions and vice versa, covenants in the loan spreads regressions. Table 6 reports the results. Columns 1-3 show loan covenants and Columns 4-6 show loan spreads.

[Table 6 about here]

As shown in Columns 1 and 4, compete-dominant banks impose fewer covenant requirements on their borrowers while charging their borrowers a higher loan spread. This is consistent with their focus on revenues and growth. In contrast, control-dominant banks require more loan covenants from their borrowers, suggesting that these banks use loan covenants to

reduce post-lending uncertainty.[21] Interestingly, we do not find evidence that control-dominant banks charge their borrowers a higher loan spread.

Furthermore, we expect the differences in loan contract terms to concentrate on the subsample of risky borrowers (i.e., unrated or rated below BBB). These are marginal cases that require banks to exercise more discretion and the ensuing loan outcomes are thus more likely to be affected by the bank's culture. This is exactly what we find when splitting the sample into sub-investment grate loans (Columns 2 and 5) and investment grade loans (Columns 3 and 6).

It is also interesting to note how control-dominant banks set-up the loan contract terms for their safe, investment-grade borrowers (those rated BBB and above). Column 3 shows that even safe borrowers of control-dominant banks are required to meet higher covenant requirements. Collectively, our results indicate that a bank's culture not only affects the loan approval decisions but also explain the characteristics of the loan contracts.

5. Bank culture and financial stability

In the previous sections, we show that a bank's culture affects the loan approval decisions and loan contract terms. However, looking at loan-level outcomes alone does not allow an overall assessment of the impact of a bank's culture on its individual risk and its contribution to systemic risk. In this section, we investigate whether a bank's culture, operating through various lending channels as documented earlier, affects its stand-alone risk as well as the bank's contribution to the risk of the financial system.

[21] Table 6 also shows that create-dominant and collaborate-dominant banks behave in a similar manner to compete-dominant and control-bank banks, respectively. This is consistent with the idea that bank lending behavior can be identified along two broader dimensions – external (compete and create) versus internal (control and collaborate).

5.1. Bank culture and loan performance

In line with the paper's focus on bank lending, this section examines whether a bank's culture affects the riskiness of its loan portfolios. We analyze two indicators that are direct outcomes of a bank's lending behavior: 1) loan growth and 2) the fraction of non-performing loans. Our empirical model is as follows:

$$y_{i,t} = \alpha_0 + \alpha_1 \text{create-dominant} + \alpha_2 \text{compete-dominant} + \alpha_3 \text{collaborate-dominant} + \alpha_4 \text{control-dominant} + \mathbf{X}_{i,t}\boldsymbol{\Gamma} + \varepsilon_{i,t} \quad (2)$$

where the dependent variable, $y_{i,t}$, is either *Loan growth*, the percentage change in total loans relative to the previous year, or *Non-performing loans*, the fraction of non-performing loans divided by total assets. Following Ellul and Yerramilli (2013), our model controls for the heterogeneity in the bank's balance sheet: bank's size, ROA, Tier-1 Capital/Assets, Deposits/Assets, Loans/Assets, Liabilities/Assets, as well as the deposit concentration at the state-level. Table 7 reports the results. Panel A is for loan growth and Panel B is for non-performing loans.

[Table 7 about here]

As shown in Table 7, compete-dominant banks enjoy a 2.72% faster loan growth relative to other banks while exhibiting a 0.89% higher fraction of non-performing loans. Therefore, the aggressive lending practices enable compete-dominant banks to enjoy rapid loan growth while cost them losses from their defaulting borrowers. In contrast, control-dominant banks have a 1.23% lower fraction of bad loans, a reward for their caution when originating and setting up loan contracts. While it may seem that control-dominant banks would exhibit a slower loan growth because of their conservative lending policies, Table 7 indicates that this is not the case. Overall, the findings in Table 7 reinforce our earlier results by revealing the consequences of aggressive lending behavior.

5.2. Industry distress, risky lending and bank risk

Given the costs associated with aggressive lending, why would some banks still prefer to adopt a compete-dominant culture and issue loans to risky borrowers? One possible explanation is that while banks can immediately enjoy the benefits associated with lax lending, they may not have to bear the costs until years later when, for instance, the industry enters distress. Thus, exploring how a bank's culture differentially affects its lending decisions and loan performance under different market conditions (i.e., normal versus distress) can shed further lights into the mechanisms through which organizational culture affects bank behavior.

Following Faleye and Krishnan (2015), we define an industry distress as a dummy that equals 1 for years in which the number of bank failures[22] is greater than the sample median, and 0 otherwise. To construct our test, we divide the sample into normal and crisis subsamples and re-estimate our loan-level (borrower's credit ratings) and bank-level (loan growth and bad loans) regression analyses. Table 8 reports the results. Columns 1-2 are for borrower's credit ratings, Columns 3-4 for loan growth and Columns 5-6 for bad loans.

[Table 8 about here]

Overall, Table 8 demonstrates a sharp contrast in bank lending behavior and loan performance across normal and distress time. During normal time, compete-dominant banks continuously extend loans to risky borrowers and, as a result, enjoy a phase of fast lending growth *without* incurring higher bad loans. However, when distress hits, compete-dominant banks start to incur bad loans, stop lending to risky borrowers and accordingly their lending growth comes to a halt. Thus, the good market conditions magnify the benefits linked to having a competitive culture while overshadowing its potential costs, causing compete-dominant banks to realize the costs of their aggressive lending only when the industry is in distress. In contrast, control-dominant banks incur a substantially lower fraction of bad loans in periods of

[22] Data obtained from the FDIC website (https://www.fdic.gov/bank/individual/failed/banklist.html)

distress. Thus, their safe lending practices during normal time payoff when the crisis hits. Overall, our results imply that the market conditions is an important mechanism that affects the costs and benefits attached to certain types of corporate culture.

5.3. Bank culture and bank's contribution to systemic risk

In the final part of the paper, we link bank culture to financial stability. A bank's lending activities could affect industry-wide stability if the bank incurs bad loans and does not have sufficient capital buffer to absorb the losses. To avoid a liquidity dry-up, the bank may be forced to borrow more heavily from the interbank funding markets and thus, create large risk spillovers to the financial system.

To test this hypothesis, we examine the relation between a bank's culture and its 1) *Tier-1 Capital*, which is Tier-1 Capital divided by total assets; and 2) Δ*CoVaR*, which is a measure of a bank's contribution to systemic risk developed by Adrian and Brunnermier (2016). It captures the estimated change in Value-at-Risk of all financial institutions when the bank's Value-at-Risk changes from its normal to a distress state. That is, it measures the extent to which the financial system is closer to distress when the bank is becoming distressed. A more negative ΔCoVaR indicates that the bank makes greater contribution to systemic risk. If banks with compete-dominant culture make greater contribution to systemic risk, the coefficient of *compete-dominant* will be negative. We include the same set of control variables and fixed effects as those in Equation (2). Table 9 reports the results. Panel A is for Tier-1 Capital and Panel B for ΔCoVaR.

[Table 9 about here]

Combined, *compete-dominant* banks are associated with a significantly higher fraction of bad loans (Table 7) while maintaining a significantly lower level of Tier-1 Capital. As a result, they produce greater contributions to systemic risk. In contrast, control-oriented banks

incur a lower fraction of bad loans, hold higher capital cushions, and therefore, their contribution to systemic risk is significantly smaller. Taken together, a bank's culture not only influences its stand-alone risk but also produces large risk spillovers to the overall banking industry.

6. Conclusion

Over a short span of two years 2015-2016, The Federal Reserve Bank of New York organized three workshops and dedicated an entire issue of the *Economic Policy Review* on improving bank culture. The Dutch Central Bank and the UK Financial Conduct Authority echo the sentiment that bank culture lies at the heart of bank behavior and has the potential to undermine financial stability. Thus, studying how bank culture affects financial stability is a question of first-order importance.

In this paper, we provide the first empirical evidence on the link between bank culture and financial stability by focusing on bank lending – a key decision-making channel through which bank culture could manifest to affect stability. We find that banks with a "compete-dominant" culture are associated with risky lending practices – higher loan approval rate, lower borrower quality, and fewer covenant requirements. Such lending behavior has large economic and societal consequences. While enjoying higher loan growth, compete-dominant banks incur more bad loans. As a result, they make greater contribution to industry-wide systemic risk. The opposite behavior is found among "control-dominant" banks, whose culture focuses on safety and control. The results are statistically significant and economically meaningful. To establish causality, we use the negative sentiment experienced by US banks during the Russian Crisis of Fall 1998.

Our work has important implications for policy makers. The president and chief executive officer of the Federal Reserve Bank of New York at the Workshop on Reforming

Culture and Behavior in the Financial Service Industry emphasizes that it is the culture of the firms that causes the financial industry to lose public trust. These views are shared by the Dutch Central Bank, which considers improving culture as the way forward to prevent future crises and misconduct scandals. The findings we report in this paper confirm that the corporate culture of banks indeed plays an important role in influencing bank behavior and banking systemic stability. Thus, the heightened regulatory focus on bank culture is justified.

Finally, it is worth noting that the effects of bank culture on lending behavior are robust to controlling for various governance metrics, including CEO compensation incentives and characteristics. This implies that "corporate culture" is a broad concept that encapsulates many factors, including norms, ethos, and implicit communications, and deserves more research attention.

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Table 1: Summary statistics

Panel A reports the summary statistics for the banks and borrowers in the sample. The sample includes all loans made by US lenders to US borrowers from 1993 to 2007. Definitions of all variables are included in Appendix I. Panel B presents a snapshot of top-ranked banks in each corporate culture quadrants.

Panel A: Summary statistics

Variables	N	Mean	STD	1st	50th	99th
Bank characteristics						
Compete-dominant	571	0.159	0.366	0.000	0.000	1.000
Create-dominant	571	0.084	0.278	0.000	0.000	1.000
Control-dominant	571	0.040	0.197	0.000	0.000	1.000
Collaborate-dominant	571	0.114	0.318	0.000	0.000	1.000
Bank size	571	17.050	1.456	14.160	16.930	20.620
Bank charter value	353	2.340	0.963	0.945	2.126	5.766
Bank leverage	571	0.915	0.017	0.859	0.917	0.952
Bank ROA	571	1.195	0.373	0.054	1.203	2.050
Bank capital (%)	482	0.075	0.016	0.046	0.072	0.130
Bank deposits	542	0.688	0.104	0.306	0.689	0.877
Bank loans	571	0.614	0.149	0.083	0.657	0.821
Bank HHI	570	0.394	0.184	0.116	0.373	1.000
Bank lending growth	317	2.789	5.819	-5.271	1.809	12.206
Bank nonperforming loans	311	5.603	3.507	0.063	5.058	15.600
ΔCoVaR	571	0.012	0.005	0.002	0.012	0.026
Borrower characteristics						
Borrower size	17,179	6.784	1.995	2.564	6.689	11.910
Borrower market-to-book	17,179	3.127	64.000	-7.800	1.959	21.470
Borrower leverage	17,179	2.567	39.360	-13.340	1.449	28.060
Borrower ROA	17,179	0.114	0.148	-0.338	0.118	0.407
Sub-investment grade	17,179	0.770	0.421	0.000	1.000	1.000

Panel B: Top-ranked banks in each corporate culture quadrant

Compete	**Create**	**Control**	**Collaborate**
PNC Financial Services	Wells Fargo	Valley National Corp	National City Corp
US Bancorp	Citigroup	UMB Financial Corp	BB&T
Corestates Financial Corp	JPMorgan & Chase	Merrill Lynch & Co Inc.	Keycorp

Table 2: Bank culture and borrower's credit quality

This table reports the probit estimation results where the dependent variable equals 1 for unrated borrowers or those rated BB+ or worse, 0 for borrowers rated BBB or better. Definitions of all variables are included in Appendix I. All models include year, borrower's sic-2 industry, and borrower's state fixed effects. Robust standard errors are clustered at the borrower-level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable: Dummy equals 1 for unrated borrowers or those rated BB+ or worse					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Compete-dominant	0.088***				0.095***
	(2.657)				(2.670)
Create-dominant		-0.006			0.025
		(-0.229)			(0.881)
Control-dominant			-0.211**		-0.211**
			(-2.352)		(-2.302)
Collaborate-dominant				0.026	0.065
				(0.657)	(1.516)
Bank size	-0.016**	-0.019***	-0.020***	-0.019***	-0.017***
	(-2.529)	(-3.019)	(-3.385)	(-3.124)	(-2.792)
Bank charter value	-0.085***	-0.083***	-0.085***	-0.083***	-0.085***
	(-6.534)	(-6.369)	(-6.525)	(-6.384)	(-6.540)
Bank leverage	0.001	0.004	0.005	0.004	0.001
	(0.294)	(1.265)	(1.570)	(1.235)	(0.422)
Bank ROA	7.926***	8.683***	8.764***	8.638***	7.820***
	(7.071)	(8.017)	(8.134)	(7.990)	(6.962)
Borrower size	-0.821***	-0.821***	-0.821***	-0.821***	-0.820***
	(-21.273)	(-21.302)	(-21.274)	(-21.271)	(-21.290)
Borrower market-to-book	-0.007***	-0.007***	-0.007***	-0.007***	-0.007***
	(-2.895)	(-2.890)	(-2.889)	(-2.890)	(-2.895)
Borrower leverage	0.004**	0.004**	0.004**	0.004**	0.004**
	(2.560)	(2.558)	(2.552)	(2.557)	(2.553)
Borrower ROA	-2.523***	-2.523***	-2.522***	-2.521***	-2.517***
	(-6.545)	(-6.540)	(-6.538)	(-6.537)	(-6.533)
Ln (Deal amount)	-0.008	-0.008	-0.008	-0.008	-0.008
	(-0.259)	(-0.251)	(-0.277)	(-0.249)	(-0.278)
Deal maturity	0.008***	0.008***	0.008***	0.008***	0.008***
	(6.258)	(6.211)	(6.315)	(6.209)	(6.336)
Relationship lending	0.043*	0.041	0.040	0.042	0.044*
	(1.664)	(1.597)	(1.552)	(1.626)	(1.700)
Same culture	-0.036	-0.021	-0.015	-0.026	-0.043
	(-0.529)	(-0.307)	(-0.223)	(-0.388)	(-0.593)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Borrower sic-2 fixed effects	Yes	Yes	Yes	Yes	Yes
Borrower state fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	41,313	41,313	41,313	41,313	41,313
Pseudo- R^2	0.492	0.492	0.492	0.492	0.492

Table 3: Bank culture and borrower's credit quality – Robustness checks

This table presents various robustness tests on the link between bank culture and borrower's credit quality. Panel A performs sensitivity tests. In Column (1), we report the baseline results estimated in Column 5 of Table 2. In Column (2), we reclassify the threshold for "dominating" culture to be in the top 10%. In Column (3), we reclassify the threshold for time-invariant dominating culture to be two-thirds of the sample. In Column (4), we reclassify time-invariant dominating culture per bank-CEO instead of per bank. Panel B controls for various CEO pay and observable characteristics. Panel C performs other robustness tests. Columns (1)-(2) report results where standard errors are clustered at the bank-year and borrower-year, respectively. Column (3) includes additional loan type and loan purpose fixed effects. In Column (4), unrated borrowers are not included, and the dependent variable equals 1 when borrowers rated BB+ and below. Column (5) excludes loans made by the top-5 largest banks. Column (6) excludes loans made during transitional year after a merger. Definitions of all variables are included in Appendix I. All models include year, borrower's sic-2 industry, and state fixed effects. Robust standard errors are clustered at the borrower-level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: Sensitivity tests				
	Baseline	Dominating threshold at 90%	Majority threshold at 67%	Majority per bank-CEO
	(1)	**(2)**	**(3)**	**(4)**
Compete-dominant	0.095***	0.201**	0.072**	0.101**
	(2.670)	(2.179)	(2.231)	(2.168)
Create-dominant	0.025	-0.099	0.040	0.058
	(0.881)	(-1.084)	(1.084)	(0.817)
Control-dominant	-0.211**	-0.274***	-0.225**	-0.237**
	(-2.302)	(-2.862)	(-2.408)	(-2.081)
Collaborate-dominant	0.065	-	-0.068*	0.067
	(1.516)	-	(-1.667)	(1.518)
Other controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Borrower sic-2 fixed effects	Yes	Yes	Yes	Yes
Borrower state fixed effects	Yes	Yes	Yes	Yes
Observations	41,313	41,313	41,313	41,313
Pseudo- R^2	0.492	0.492	0.493	0.492

Panel B: Control for CEO characteristics and pay		
	(1)	**(2)**
Compete-dominant	0.092**	0.076**
	(2.514)	(2.035)
Create-dominant	0.024	0.026
	(0.868)	(0.900)
Control-dominant	-0.347***	-0.335***
	(-2.815)	(-2.729)
Collaborate-dominant	0.059	0.069
	(1.381)	(1.623)
Bonus/Salary	0.024	0.021
	(0.719)	(0.636)
Equity/(Bonus + Salary)	0.004**	0.004**
	(2.266)	(2.233)
CEO age	-	-0.004*
	-	(-1.929)
Ivy League	-	-0.025
	-	(-1.168)
Experienced CEO	-	0.031
		(1.553)
Other controls	Yes	Yes
Year fixed effects	Yes	Yes
Borrower sic-2 fixed effects	Yes	Yes
Borrower state fixed effects	Yes	Yes
Observations	40,351	39,551
Pseudo- R^2	0.492	0.491

Table 3: Bank culture and borrower's quality – Robustness checks (cont.)

Panel C: Other robustness tests						
	Cluster by bank-year	Cluster by borrower-year	Add loan type and loan purpose FE	Junk grade vs. investment grade only	Exclude top 5 banks	Exclude post-merger year
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Compete-dominant	0.087**	0.087***	0.063*	0.119***	0.107***	0.096**
	(2.535)	(2.855)	(1.821)	(2.939)	(2.955)	(2.130)
Create-dominant	0.028	0.028	0.028	0.102***	0.047	0.033
	(0.873)	(1.188)	(0.996)	(3.230)	(1.308)	(1.121)
Control-dominant	-0.208*	-0.208**	-0.312***	-0.213**	-0.221**	-0.221**
	(-1.656)	(-2.362)	(-3.374)	(-2.087)	(-2.436)	(-2.354)
Collaborate-dominant	0.044	0.044	0.052	0.043	0.060	0.070
	(1.147)	(1.316)	(1.186)	(0.849)	(1.370)	(1.498)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower sic-2 fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower state fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	41,088	41,088	40,997	26,350	28,704	33,836
Pseudo- R^2	0.513	0.513	0.527	0.431	0.521	0.490

Table 4: 1998 Russian default, bank culture, and borrower's quality

This table reports the probit estimation results where the dependent variable equals 1 for unrated borrowers or those rated BB+ or worse, 0 for borrowers rated BBB or better. *Post-Russian default* is a dummy that equals 1 for all months on and after August 1998. Column (1), (2) and (3) respectively report results using three-month (July 1998 to September 1998), four-month (July 1998 to October 1998) and five-month (June 1998 to October 1998) windows surrounding the Russian default event. Column (4) reports results of a placebo test where the post- and pre-Russian default periods are falsely defined to be exactly one year prior to the actual default date. Definitions of all variables are included in Appendix I. All models include year, borrower's sic-2 industry, and state fixed effects. Robust standard errors are clustered at the borrower-level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

	3-month	4-month	5-month	Placebo event 1 year prior to August 1998
	(1)	**(2)**	**(3)**	**(4)**
Compete-dominant * Post-Russian default	-0.085**	-0.087**	-0.086**	0.004
	(-2.204)	(-2.091)	(-2.124)	(0.097)
Create-dominant * Post-Russian default	-0.016	-0.027	-0.030	-0.062
	(-0.346)	(-0.619)	(-0.685)	(-1.505)
Control-dominant * Post-Russian default	-0.066	-0.091	-0.089	0.101
	(-0.498)	(-0.692)	(-0.711)	(0.635)
Collaborate-dominant * Post-Russian default	0.041	0.046	0.054	0.005
	(0.699)	(0.828)	(1.050)	(0.080)
Post-Russian default	-0.005	-0.020	-0.017	-0.091*
	(-0.100)	(-0.461)	(-0.413)	(-1.796)
Compete-dominant	0.077**	0.058	0.065*	0.026
	(2.268)	(1.444)	(1.747)	(0.660)
Create-dominant	-0.046	-0.021	-0.007	0.045
	(-1.179)	(-0.540)	(-0.183)	(1.235)
Control-dominant	-0.015	-0.024	-0.013	0.097
	(-0.140)	(-0.229)	(-0.124)	(0.664)
Collaborate-dominant	0.012	-0.007	-0.013	0.027
	(0.241)	(-0.144)	(-0.281)	(0.533)
Other controls	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Borrower sic-2 fixed effects	Yes	Yes	Yes	Yes
Borrower state fixed effects	Yes	Yes	Yes	Yes
Observations	1,198	1,582	2,003	54,195
Pseudo- R^2	0.703	0.641	0.604	0.491

Table 5: Bank culture and mortgage approvals

This table reports the estimation results where the dependent variable is *Loan approval ratio*, defined as the number of approved loans divided by the total number of loan applications. The data are from the Home Mortgage Disclosure Act (HMDA) Loan Application Registry and are aggregated at the bank-county-year level. Definitions of all variables are included in Appendix I. All models include county-year fixed effects. Robust standard errors are clustered at the county-level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variable = Loan approval ratio					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Compete-dominant	0.187***				0.188***
	(0.052)				(0.050)
Create-dominant		-0.071			-0.078
		(0.058)			(0.048)
Control-dominant			-0.313***		-0.323***
			(0.075)		(0.085)
Collaborate-dominant				0.017	0.015
				(0.031)	(0.032)
Ln(Total Income)	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fraction of female applicants	-0.095***	-0.095***	-0.095***	-0.095***	-0.095***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Fraction of minority applications	-0.222***	-0.222***	-0.222***	-0.222***	-0.222***
	(0.003	(0.003	(0.003	(0.003	(0.003
Bank size	-0.014***	-0.014***	-0.014***	-0.014***	-0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Bank charter value	0.015***	0.015***	0.015***	0.015***	0.015***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Bank leverage	-0.214***	-0.214***	-0.214***	-0.214***	-0.214***
	(0.049)	(0.049)	(0.049)	(0.049)	(0.049)
Bank ROA	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
County*year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	372,457	372,457	372,457	372,457	372,457
R^2	0.122	0.122	0.122	0.122	0.122

Table 6: Lender culture and other loan terms

This table reports the regression results of borrowers' financial covenants (columns 1-3) and loan spread (columns 4-6) on measures of lender's dominant corporate. Definitions of all variables are included in Appendix I. All models include year, borrower's sic-2 industry, and state fixed effects. Robust standard errors are clustered at the borrower-level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Dependent variables:	**Debt covenants**			**Loan spread**		
	All borrowers	Sub-investment grade	Investment grade	All borrowers	Sub-investment grade	Investment grade
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Compete-dominant	-0.034*	-0.043*	0.009	0.052***	0.046***	0.018
	(-1.900)	(-1.871)	(0.420)	(3.992)	(3.373)	(1.254)
Create-dominant	-0.097***	-0.106***	-0.014	0.060***	0.091***	0.001
	(-5.636)	(-5.003)	(-0.966)	(5.039)	(7.173)	(0.037)
Control-dominant	0.170**	0.134*	0.101*	0.026	0.130**	-0.126
	(2.574)	(1.662)	(1.903)	(0.517)	(2.492)	(-1.528)
Collaborate-dominant	0.050**	0.052**	-0.001	0.014	-0.011	0.043
	(2.438)	(2.166)	(-0.025)	(1.118)	(-0.818)	(1.584)
Bank size	0.003	-0.000	0.002	-0.014***	-0.017***	-0.004
	(0.821)	(-0.073)	(0.720)	(-5.776)	(-6.324)	(-1.353)
Bank charter value	0.008	0.015	-0.009	-0.047***	-0.039***	-0.016***
	(1.053)	(1.616)	(-1.372)	(-9.843)	(-7.426)	(-2.754)
Bank leverage	0.004**	0.008***	-0.004**	0.007***	0.009***	0.007***
	(2.366)	(3.807)	(-2.373)	(6.310)	(6.972)	(4.195)
Bank ROA	-1.156	-1.775**	1.502**	5.190***	4.865***	1.283
	(-1.535)	(-2.463)	(2.325)	(12.008)	(11.266)	(1.491)
Borrower size	-0.118***	-0.085***	-0.165***	-0.233***	-0.153***	-0.081***
	(-7.473)	(-9.373)	(-6.040)	(-17.840)	(-12.892)	(-6.798)
Borrower market-to-book	-0.002	-0.002**	-0.002	-0.002	-0.002	-0.004***
	(-1.434)	(-2.531)	(-1.047)	(-1.448)	(-1.338)	(-4.732)
Borrower leverage	0.001*	0.001***	0.009	0.001	0.001	0.010***
	(1.743)	(2.738)	(1.424)	(1.511)	(1.461)	(4.100)
Borrower ROA	0.337***	0.455***	-0.688***	-1.742***	-1.597***	-1.524***
	(2.676)	(6.620)	(-2.810)	(-16.827)	(-16.550)	(-6.338)
Ln (Loan amounts)	0.060***	0.064***	0.044*	0.024*	0.018	-0.005
	(3.720)	(6.618)	(1.812)	(1.788)	(1.547)	(-0.357)
Deal maturity	0.009***	0.009***	0.001	0.003***	0.001**	0.001*
	(12.020)	(23.841)	(1.316)	(5.092)	(2.362)	(1.975)
Ln (Spread)	0.513***	0.450***	0.360***	0.226***	0.146***	0.310***
	(21.710)	(35.603)	(8.967)	(22.113)	(16.424)	(26.626)
Covenants	-	-	-			
	-	-	-			
Relationship lending	0.025	0.023*	0.011	0.003	0.021*	0.009
	(1.607)	(1.771)	(0.583)	(0.277)	(1.885)	(0.691)
Same culture	-0.026	-0.031	0.011	-0.072***	-0.048**	-0.100**
	(-0.723)	(-1.014)	(0.279)	(-3.098)	(-2.147)	(-2.471)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower sic-2 fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower state fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	24,750	18,137	6,613	24,750	18,137	6,613
R^2	0.394	0.280	0.455	0.547	0.426	0.519

Table 7: Lender culture and loan outcomes

This table reports the regression results. The dependent variables are the percentage change in total assets relative to prior year (Panel A) and fraction of non-performing loans (Panel B). Definitions of all variables are included in Appendix I. All models include year fixed effects. Robust standard errors are clustered at the borrower-level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: Bank lending growth					
Dependent variable: Loan growth					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Compete-dominant	2.541***				2.562**
	(2.675)				(2.207)
Create-dominant		0.520			1.996
		(0.336)			(1.181)
Control-dominant			-1.487		0.417
			(-1.134)		(0.285)
Collaborate-dominant				0.347	0.891
				(0.433)	(1.031)
Bank size	0.240	0.034	0.010	0.092	-0.120
	(0.856)	(0.116)	(0.037)	(0.336)	(-0.342)
Bank leverage	-62.945*	-62.054	-58.257	-62.999*	0.588
	(-1.744)	(-1.637)	(-1.498)	(-1.672)	(0.324)
Bank ROA	-0.247	-0.052	-0.105	-0.050	-0.475
	(-0.221)	(-0.044)	(-0.089)	(-0.043)	(-0.669)
Bank capital	0.544*	0.553*	0.582**	0.560*	-65.758
	(1.936)	(1.906)	(1.997)	(1.914)	(-1.563)
Bank deposits	1.941	0.165	0.257	0.431	0.686
	(0.336)	(0.030)	(0.046)	(0.076)	(0.111)
Bank lending	-16.544***	-18.085***	-18.643***	-18.565***	-20.663***
	(-3.622)	(-3.489)	(-3.666)	(-3.544)	(-3.481)
Bank HHI	-1.622	-1.178	-1.307	-1.194	-2.161
	(-1.066)	(-0.775)	(-0.852)	(-0.784)	(-1.413)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	317	317	317	317	265
R-squared	0.240	0.221	0.224	0.221	0.282

Panel B: Bank nonperforming loans					
Dependent variable: Non-performing loans/Total assets					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Compete-dominant	0.927**				0.892**
	(2.344)				(2.058)
Create-dominant		1.436			1.775*
		(1.457)			(1.785)
Control-dominant			-1.560***		-1.234**
			(-3.244)		(-2.264)
Collaborate-dominant				0.329	0.523
				(0.712)	(1.118)
Bank size	0.801***	0.652***	0.653***	0.737***	0.660***
	(4.620)	(3.747)	(3.584)	(4.146)	(3.725)
Bank ROA	-1.441***	-1.429***	-1.442***	-1.440***	-1.459***
	(-2.908)	(-2.932)	(-3.006)	(-3.002)	(-2.929)
Bank capital	0.260	0.264	0.313*	0.267	0.308*
	(1.503)	(1.524)	(1.802)	(1.556)	(1.753)
Bank deposits	-1.522	-1.882	-2.413	-2.164	-0.629
	(-0.569)	(-0.705)	(-0.913)	(-0.808)	(-0.231)
Bank lending	12.443***	11.792***	11.362***	11.470***	11.926***
	(13.889)	(12.582)	(12.664)	(11.942)	(12.249)
Bank leverage	-12.752	-14.999	-8.936	-14.920	-7.947
	(-1.105)	(-1.307)	(-0.746)	(-1.276)	(-0.659)
Bank HHI	-1.101	-0.899	-1.000	-0.898	-0.902
	(-1.454)	(-1.172)	(-1.336)	(-1.183)	(-1.213)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	290	290	290	290	290
R-squared	0.437	0.435	0.436	0.429	0.451

Table 8: Distress vs. Non-distress Periods

This table reports the estimation results where we divide the sample into distress and non-distress period. Distress is defined as a dummy that equals 1 for years when the number of bank failures is greater than the sample median, and 0 otherwise. All variables are described in detail in Appendix I. The analysis is conducted at bank level. All models include year, borrower's sic-2 industry, and state fixed effects. Robust standard errors are clustered at the bank level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

	Sub-investment grade lending		Loan growth		Bad loans	
	Distress = 0	Distress = 1	Distress = 0	Distress = 1	Distress = 0	Distress = 1
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Compete-dominant	0.110***	0.054	2.415**	1.134	0.104	1.207*
	(2.839)	(1.541)	(1.988)	(0.750)	(0.173)	(1.749)
Create-dominant	0.037	0.000	-0.195	3.298	6.155***	0.130
	(1.238)	(0.011)	(-0.100)	(1.426)	(4.965)	(0.130)
Control-dominant	-0.081	-0.282***	-2.545	-0.257	-1.666**	-2.217***
	(-0.658)	(-2.664)	(-1.316)	(-0.142)	(-2.438)	(-2.790)
Collaborate-dominant	0.009	0.070	-0.016	1.336	0.460	1.037
	(0.218)	(1.253)	(-0.014)	(1.104)	(0.785)	(1.336)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Borrower sic-2 fixed effects	Yes	Yes	-	-	-	-
Borrower state fixed effects	Yes	Yes	-	-	-	-
Observations	25,897	28,158	179	153	151	139
R-squared	0.497	0.500	0.276	0.192	0.576	0.425

Table 9: Bank culture and systemic risk

This table reports the regression results. The dependent variables are Tier-1 Capital divided by total assets (Panel A) and ΔCoVaR (Panel B). ΔCoVaR is developed by Adrian and Brunnermeier's (2016), which is the difference between the CoVaR conditional on a bank being in distress and the CoVaR conditional on a bank operating in its median state. Definitions of all variables are included in Appendix I. All models include year, borrower's sic-2 industry, and state fixed effects. Robust standard errors are clustered at the borrower-level. *, **, and *** denote statistical significance at 10%, 5%, and 1% levels, respectively.

Panel A: Bank capital					
Dependent variable: Tier-1 Capital/Total assets					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Compete-dominant	-0.293**				-0.260*
	(-2.167)				(-1.771)
Create-dominant		0.028			-0.049
		(0.174)			(-0.274)
Control-dominant			0.588***		0.471***
			(3.813)		(2.816)
Collaborate-dominant				-0.207	-0.230
				(-1.181)	(-1.270)
Bank size	-0.366***	-0.349***	-0.332***	-0.353***	-0.355***
	(-5.867)	(-5.443)	(-5.239)	(-5.660)	(-5.576)
Bank leverage	-42.021***	-41.848***	-41.866***	-41.434***	-41.557***
	(-6.827)	(-6.824)	(-6.849)	(-6.830)	(-6.840)
Bank ROA	0.590**	0.596**	0.611**	0.610**	0.619**
	(2.304)	(2.364)	(2.446)	(2.405)	(2.407)
Bank deposits	0.779	0.855	0.706	0.712	0.510
	(0.803)	(0.859)	(0.713)	(0.717)	(0.513)
Bank lending	-0.801*	-0.590	-0.393	-0.462	-0.477
	(-1.758)	(-1.336)	(-0.884)	(-1.024)	(-0.976)
Bank HHI	-1.343***	-1.370***	-1.279***	-1.411***	-1.320***
	(-4.722)	(-4.775)	(-4.422)	(-4.905)	(-4.514)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	426	426	426	426	426
R-squared	0.491	0.487	0.493	0.488	0.498

Panel B: Systemic risk					
Dependent variable = ΔCoVar (x100)					
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Compete-dominant	-0.167**				-0.155**
	(-2.471)				(-2.236)
Create-dominant		0.000			-0.029
		(0.001)			(-0.342)
Control-dominant			0.200***		0.158**
			(3.352)		(2.411)
Collaborate-dominant				0.012	-0.003
				(0.271)	(-0.075)
VaR	3.853*	2.097	3.174	2.100	4.549**
	(1.903)	(1.059)	(1.510)	(1.063)	(2.175)
Bank size	0.022	0.036*	0.042**	0.036*	0.030
	(1.150)	(1.878)	(2.301)	(1.946)	(1.554)
Bank leverage	3.614***	3.688***	3.085**	3.673***	3.140**
	(2.628)	(2.628)	(2.116)	(2.604)	(2.166)
Bank ROA	0.218***	0.213***	0.219***	0.212***	0.223***
	(4.177)	(4.137)	(4.259)	(4.142)	(4.242)
Bank deposits	0.010	0.013	0.006	0.013	0.005
	(0.610)	(0.766)	(0.351)	(0.777)	(0.279)
Bank loans	-0.022	0.051	0.038	0.061	-0.039
	(-0.073)	(0.170)	(0.126)	(0.200)	(-0.127)
Bank capital	-0.667***	-0.565***	-0.503***	-0.573***	-0.618***
	(-4.540)	(-4.274)	(-3.703)	(-4.107)	(-3.759)
Bank HHI	0.256**	0.236**	0.236**	0.238**	0.250**
	(2.361)	(2.150)	(2.152)	(2.154)	(2.285)
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	378	378	378	378	378
R-squared	0.481	0.478	0.484	0.478	0.495

Appendix I: Definitions of variables

Variable	Definition	Source
Bank characteristics		
Compete-dominant	A dummy that equals to 1 if the frequency of words associated with compete culture is in the top quartile relative to other banks in more than half of the bank's sample observations	10K reports
Create-dominant	A dummy that equals to 1 if the frequency of words associated with create culture is in the top quartile relative to other banks in more than half of the bank's sample observations	10K reports
Control-dominant	A dummy that equals to 1 if the frequency of words associated with control culture is in the top quartile relative to other banks in more than half of the bank's sample observations	10K reports
Collaborate-dominant	A dummy that equals to 1 if the frequency of words associated with collaborate culture is in the top quartile relative to other banks in more than half of the bank's sample observations	10K reports
Bank size	Natural logarithm of total assets (BHCK2170)	FR Y-9C
Bank charter value	Market value of equity divided by the book value of equity	CRSP, FR Y-9C
Bank leverage	Book value of liabilities divided by book value of total assets	FR Y-9C
Bank ROA	Earnings before interest and taxes (EBIT) divided by book value of total assets (BHCK2170)	CRSP, FR Y9-C
Bank capital	Ratio of Tier-1 Capital (BHCK8274) divided by total assets	FR Y-9C
Bank deposits	Ratio of total deposits (BHDM6631+BHFN6631 + BHDM6636 + BHFN6636) divided by total assets	FR Y-9C
Bank loans	Ratio of total loans (BHCK2122) divided by total assets	FR Y-9C
Bank HHI	Index measuring the concentration of deposits at the state level	FR Y-9C
Bank lending growth	The percentage of change in total assets relative to prior year	FR Y-9C
Bank nonperforming loans	Ratio of loans past due day 90 days or more (BHCK5525) and nonaccrual loans (BHCK5526) divided by total assets	FR Y9-C
ΔCoVar	The estimated change in Value-at-Risk of all financial institutions when the bank's Value-at-Risk changes from its normal state to a distress state.	Adrian and Brunnermeier (2016)
CEO pay and characteristics		
Bonus/Salary	CEO bonus compensation divided by CEO salary	ExecuComp, DEF14A
Equity/(Bonus+Salary)	CEO equity compensation divided by the sum of bonus and salary compensation.	ExecuComp, DEF14A
CEO age	The age of the CEO, measured in years.	BoardEx
Ivy League	Equals 1 if the CEO has an Ivy League education	BoardEx
Experienced CEO	Equals 1 if the CEO with previous executive appointments	BoardEx
Borrower characteristics		
Borrower size	Natural logarithm of total assets (BHCK2170)	Compustat
Borrower market-to-book	Market value of equity divided by the book value of equity	Compustat
Borrower leverage	Book value of liabilities divided by book value of total assets	Compustat
Borrower ROA	Earnings before interest and taxes (EBIT) divided by book value of total assets (BHCK2170)	Compustat
Sub-investment grade	A dummy equals 1 if the borrower has a sub-investment credit rating grade (i.e., unrated or rated BBB and below)	Compustat
Syndicate loan characteristics		
Ln (Deal amount)	Natural logarithm of loan amount	Dealscan
Deal maturity	The number of calendar months between the loan origination date and loan maturity date	Dealscan
Covenants	The number of financial covenants	Dealscan
Ln(Spread)	Natural logarithm of the all-in-drawn loan spread	Dealscan

Relationship lending	A dummy variable that equals to one if a borrower has another loan from the same bank in the three years period prior to the loan origination.	Dealscan
Mortgage loan characteristics		
Loan approval ratio	The number of approved loans divided by the total number of loan applications.	HMDA
Ln(Total income)	The average borrower income for applications reviewed in each bank-county-year (excluded 1% tail)	HMDA
Fraction of female applicants	The ratio of the number of applications from female applicants to the total number of applications reviewed in each bank-county-year.	HMDA
Fraction of minority applicants	The ratio of the number of applications from minority applicants to the total number of applications reviewed in each bank-county-year. Minority applicants include all applicants whose reported race is other than white.	HMDA

Figure 1: Four cultural dimensions (Cameron et al., 2006)

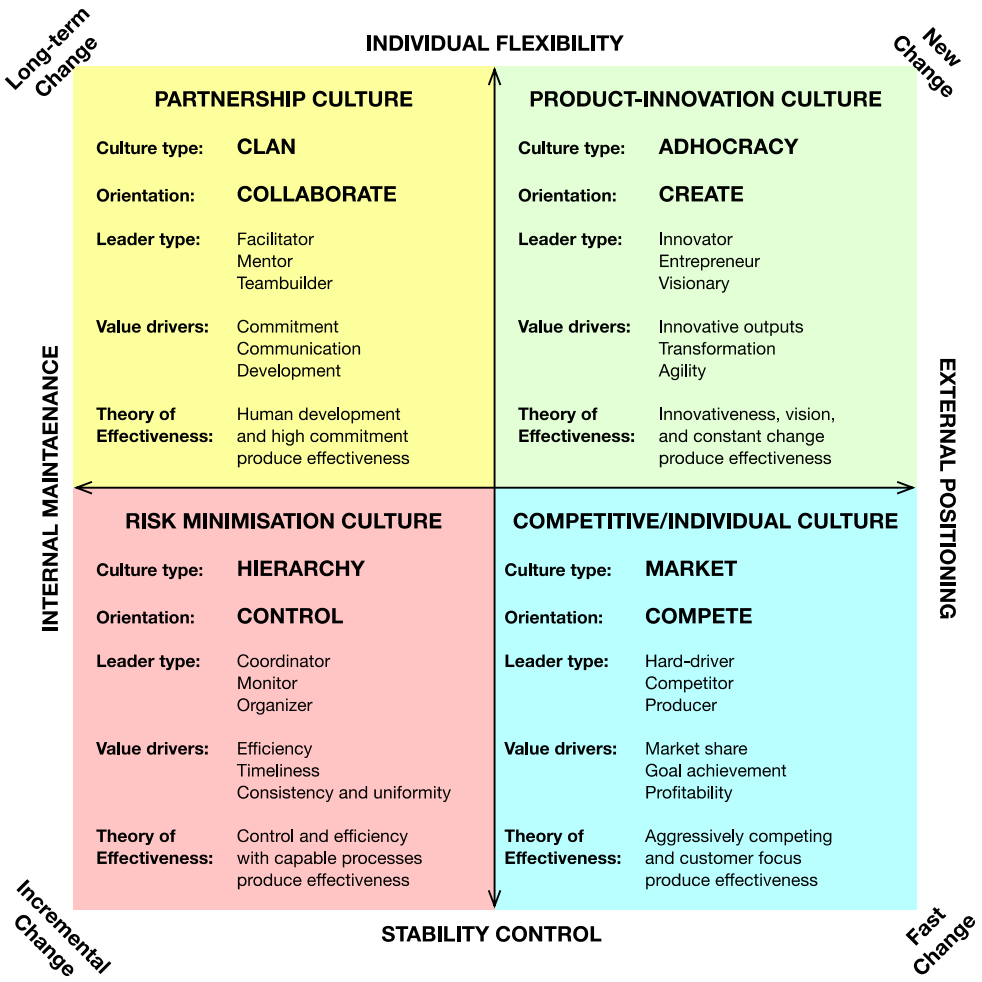

Figure 2: Bag of words (Fiordelisi & Ricci, 2014)

Culture type	Bag of words
Control	capab*, collectiv*, commit*, competenc*, conflict*, consens*, control*, coordin*, cultur*, decentr*, employ*, empower*, engag*, expectat*, facilitator*, hir*, interpers*, involv*, life*, long-term*, loyal*, mentor*, monit*, mutual*, norm*, parent*, partic*, procedur*, productiv*, retain*, reten*, skill*, social*,tension*, value*
Compete	achiev*, acqui*, aggress*, agreem*, attack*, budget*, challeng*, charg*, client*, compet*, customer*, deliver*, direct*, driv*, excellen*, expand*, fast*, goal*, growth*, hard*, invest*, market*, mov*, outsourc*, performanc*, position*, pressur*, profit*, rapid*, reputation, result*, revenue*, satisf*, scan*, succes* signal*, speed*, strong, superior, target*, win*
Collaborate	boss*, burocr*, cautio*, cohes*, certain*, chief*, collab*, conservat*, cooperat*, detail*, document*, efficien*, error*, fail*, help*, human*, inform*, logic*, method*, outcom*, partner*, people*, predictab*, relation*, qualit*, regular*, solv*, share*, standard*, team*, teamwork*, train*, uniform*, work group*
Create	adapt*, begin*, chang*, creat*, discontin*, dream*, elabor*, entrepre*, envis*, experim*, fantas*, freedom*, futur*, idea*, init*, innovat*, intellec*, learn*, new*, origin*, pioneer*, predict*, radic*, risk*, start*, thought*, trend*, unafra*, ventur*, vision*