# WORKING PAPERS IN RESPONSIBLE BANKING & FINANCE

## Organizational Culture, Competition and Bank Loan Loss Provisions

By *Hiep N. Luu, Linh H. Nguyen, John O.S. Wilson*

**Abstract:** This paper investigates how banks with different organizational cultures (defined as either control-dominant, collaborate-dominant, compete-dominant, create-dominant) manage their loan loss provisions (LLPs) in response to intensified industry competition. For identification, we utilise the change in state level competition that followed the passage of the US Interstate Banking and Branching Efficiency Act (IBBEA) of 1994 as a quasi-natural experiment. We find that banks with a collaborate-dominant organizational culture are less likely to exercise discretion over LLPs. In contrast, banks with compete- and create-dominant organizational cultures have higher discretionary LLPs when competition increases. Moreover, banks use discretionary LLPs to smooth income and signal private information to outsiders. This varies with organizational culture. Specifically, banks with collaborate-dominant organizational cultures exhibit less income smoothing, while counterparts with create-dominant use discretionary LLPs as an information signalling device to outside stakeholders. Finally, banks with a create-dominant organizational culture are more likely to be subject to formal regulatory enforcement actions.

University of St Andrews
Scotland's first university

600 YEARS
1413 – 2013

# Organizational Culture, Competition and Bank Loan Loss Provisioning

## Abstract

This paper investigates how banks with different organizational cultures (defined as either control-dominant, collaborate-dominant, compete-dominant, create-dominant) manage their loan loss provisions (LLPs) in response to intensified industry competition. For identification, we utilise the change in state level competition that followed the passage of the US Interstate Banking and Branching Efficiency Act (IBBEA) of 1994 as a quasi-natural experiment. We find that banks with a collaborate-dominant organizational culture are less likely to exercise discretion over LLPs. In contrast, banks with compete- and create-dominant organizational cultures have higher discretionary LLPs when competition increases. Moreover, banks use discretionary LLPs to smooth income and signal private information to outsiders. This varies with organizational culture. Specifically, banks with collaborate-dominant organizational cultures exhibit less income smoothing, while counterparts with create-dominant use discretionary LLPs as an information signalling device to outside stakeholders. Finally, banks with a create-dominant organizational culture are more likely to be subject to formal regulatory enforcement actions.

**JEL Codes:** G20; G21; G28; M14; M41

**Keywords:** Bank deregulation; Organizational culture; Competition; Discretionary loan loss provisions; Textual analysis

**1. Introduction**

Excessive competition and faulty organizational culture contributed to the numerous instances of accounting misreporting, price fixing, money laundering, mis-selling and fraud observed during the global financial crisis of 2007-2009 (Group of Thirty, 2015; Nguyen et al., 2016; Song and Thakor, 2019).[1] A subsequent decline in public trust led to calls for greater bank transparency including more accurate disclosure of accruals via loan loss provisions in order to achieve an accurate picture of the current and likely future financial condition of individual banks. Given the paucity of evidence, and the importance for individual bank and system wide risk, this paper investigates the importance of competition and organizational culture for the loan loss provisioning behaviour of banks.

Loan loss provisions constitute the most significant accrual facing banks and can be decomposed into non-discretionary and discretionary components (Jiang et al., 2016). Prior evidence suggests that banks can opportunistically exercise discretion over loan loss provisions to smooth earnings, manage capital, or signal private information to outsiders (Beatty and Liao, 2014; Curcio and Hasan, 2015). Such discretionary behaviour can lead to less accurate disclosure and increased bank opacity with resultant difficulties for outside stakeholders to accurately assess the current and future prospects of individual banks (Fonseca and González, 2008). Consequently, an understanding of the extent to which competition and organizational culture drive discretionary loan loss provisioning is of relevance to depositors, borrowers, shareholders, and government agencies with responsibility for supervising the behaviour of financial institutions.[2]

Prior evidence suggests that there is a link between organizational culture and behaviour of non-financial firms with respect to: CEO turnover (Fiordelisi and Ricci, 2014); innovation (Fiordelisi et al., 2019); risk (Hilary and Hui, 2009); and post-merger synergies (Doukas and Zhang, 2021). However, while this literature provides valuable insights into the impact of organizational culture, it has until recently, neglected the role of organizational culture in banks. In common with non-financials, bank behaviour is likely to be shaped by organizational culture. Banks operate in a competitive environment and take operational decisions to maximise value (Hoenig and Morris, 2012). Recent evidence suggests that organizational culture affects both the risk and returns of banks (Nguyen et al., 2019; Barth and

---

[1] Culture can be defined as a set of values that are shared across organizations (O'Reilly and Chatman, 1996), which, in turn, determine how organizations respond to changing circumstances (Murphy, 1989).

[2] An extensive evidence base (surveyed in Beatty and Liao, 2014) now exists which examines the underlying determinants of banks discretionary loan loss provisions.

Mansouri, 2021). In this study, we augment and complement these recent insights to investigate the role of organizational culture and the competitive environment in driving the loan loss provisioning decisions of banks.

There are significant inherent challenges to accurately assessing how organizational culture affects loan loss provisioning decisions under various competitive conditions. First, potential endogeneity issues could lead to bias in any observed relationships. For example, banks may choose the market in which to compete, and then make various operational decisions accordingly (Graham et al., 2005). Second, organizational culture is an abstract concept, which is difficult to measure. Even if organizational culture can be measured accurately, there are likely to be unobserved factors that are correlated with both organizational culture and bank-level outcome variables. This can make any estimation of the impact of organizational culture on bank behaviour (with respect to loan loss provisions and other outcome variables) difficult to establish and disentangle.

The research design adopted in this study allows us to overcome these challenges. We use a quasi-natural experimental research design to investigate how a change in state level competition (following deregulation) interacts with organizational culture to impact the discretionary loan loss provisioning decisions of banks. The basic intuition is that an industry level shock causes banks to respond strategically to adjust to changes in the industry environment. Any changes to bank behaviour are likely to be determined by the prevailing organizational culture. If organizational culture matters, then following changes to the industry environment arising from deregulation, we should observe systematic differences in discretionary loan loss provisions across banks with different organizational cultures.

The US banking industry and the Interstate Banking and Branching Efficiency Act (IBBEA) passed in 1994 serves as an ideal setting to assess the impact of competition and organizational culture on bank loan loss provisioning. The IBBEA removed interstate branching restrictions and barriers to entry, and thus intensified competition amongst banks. A unique feature of the IBBEA was that, while it removed the federal restrictions on the geographic expansion of banks, it also granted individual states the discretion to continue to regulate interstate branching (and thus competition). Thus, interstate banking deregulation was staggered across both space and time (Rice and Strahan, 2010; Goetz, 2018). More importantly, the decisions of individual states to regulate local banking markets was not related to bank loan loss provisioning, thus allowing us to reduce potential endogeneity concerns (Dou et al., 2018). As such, our research setting allows us to investigate if organizational culture affects banks' loan loss provisioning decisions under different competitive conditions. In other words, the use

of IBBEA as a setting in this study is based on the idea that a sudden change in competition caused by the enactment of IBBEA may lead to increased entry of new banks with subsequent pressure on the margins of industry incumbents. When facing increased competitive pressure, incumbent banks respond, with reactions varying by prevailing organizational culture (Schein, 1985). Without the IBBEA as an external exogenous event, it is difficult to establish causality between organizational culture and discretionary loan loss provisions. This setting also allows us to overcome a major identification challenge that unobserved factors could be correlated with both organizational culture and the loan loss provisioning of banks.

Our dataset comprises annual data from publicly listed US bank holding companies (BHCs) covering the period 1994 to 2006. The year of the IBBEA enactment is chosen as the start of the sample period. In order to measure and classify organizational culture, we utilise the Competing Value Framework (CVF) approach (Cameron et al., 2006). The CVF identifies four organizational cultures, comprising compete-, create-, collaborate-, and control-oriented. Each culture is associated with different beliefs and values with resultant implications for bank behaviour. Compete- and create-oriented cultures have an external focus and  focus on *growth*. However, while the create-oriented culture is associated with continuous change, entrepreneurship and vision, the compete-oriented culture aggressively responds to changes in external circumstances. In contrast, collaborate-, and control-oriented organizational cultures are both internally focussed with an emphasis on *safety*. The control-oriented organizational culture, nevertheless, is associated with capable processes, predictability, and control, while the collaborate-oriented culture prioritises employee development and empowerment (Cameron et al., 2006; Nguyen et al., 2019).

To measure organizational culture using the CVF, we follow prior literature and use textual analysis (Fiordelisi and Ricci, 2014; Nguyen et al., 2019; Fiordelisi and Ricci, 2021). This allows us to capture variations in organizational culture across a large sample of banks; an exercise that is likely to be infeasible using conventional soft information data collection methods (such as surveys, questionnaires, and interviews). Under this approach, several specific keywords associated with each organizational culture is chosen. The frequencies in which each of these keywords appear in official documents produced by banks to communicate with outside stakeholders are then calculated (Loughran and McDonald, 2011). In the empirical analysis presented in Section 4, we posit that banks with *control-* and *collaborate*-dominant organizational cultures (those focus on safety) are less likely to exercise discretion over loan loss provisions when there is an increase in competition. In contrast, banks with *create-* and

*compete*-dominant organizational cultures (with a growth focus) are more likely to exercise discretion over loan loss provisions when there is an increase in competition.

We follow common practice in the accounting literature and differentiate between discretionary and non-discretionary components of loan loss provisions (Hamadi et al., 2016). Specifically, we use the absolute value of residuals derived from estimating a model that allows us to disentangle the discretionary and non-discretionary components of loan loss provisions. The resultant discretionary loan loss provisions are used as our primary outcome variable of interest in our empirical analysis. In our baseline analysis, we regress discretionary loan loss provision on different organizational cultures. However, given that our key aim is to investigate how organizational culture affects discretionary loan loss provisions in response to a sudden increase in industry competition, we interact organizational culture with a competition index (derived from state-level regulatory restrictions on banking activities). This allows us to evaluate how organizational culture affects discretionary loan loss provisions when banks face a sudden change in industry competition following deregulation.

By way of preview, we find that banks with compete- and create-dominant organizational cultures (which encourage aggressive growth, competition and risk-taking) increase discretionary loan loss provisions when competition increases. By contrast, collaborate-dominant banks (with an organizational culture of compliance, cooperation, and safety) place less reliance on discretionary loan loss provisions following increases in competition. Overall, our results suggest that organizational culture influences the accounting choices of banks, and this varies by the extent of industry competition.

We conduct additional analyses to assess the underlying factors driving the increased use of discretionary loan loss provisions following increased competition. Prior evidence suggests that banks utilise discretion over loan loss provisions to smooth earnings, signal future performance and manage capital management We test these propositions and find that banks with a create-oriented organizational culture (which encourages risk-taking and rule-breaking) are more likely to use discretionary loan loss provisions to signal private information to outside investors when competition increases. Banks with a collaborate-dominant organizational culture (which embraces compliance with formal rules and legislation) are less likely to engage in earnings smoothing behaviour.

The manipulation of loan loss provisions can distort the quality of information produced regarding the current and likely future financial condition of banks. This could lead to misleading information conveyed to regulators, shareholders, and other market participants. Consequently, excessive use of discretionary loan loss provisions could attract regulatory

scrutiny, and in some cases lead to formal disciplinary sanction (Dechow et al., 1996). In order to test this proposition, we hand-collect data on formal enforcement actions imposed by the three US federal banking agencies (comprising the Federal Reserve Board, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency). We then investigate the likelihood of a bank following a particular organizational culture receiving formal regulatory sanctions. We find that banks with a create-dominant culture are more likely to be subject to regulatory sanctions when competition increases.

We conduct a series of robustness tests to verify the reliability of the findings. The first set are the parallel trend assumption test in which the dates of state deregulation and competition intensity are falsified. In one test, we randomly assign individual states into each of the deregulation years, while retaining corresponding competition values. In another, we randomly assign states to the competition values and keep the actual date of deregulation. The second set of tests seek to rule out other possibilities that may affect the main results including: changes in macroeconomic conditions (state trends, economic outputs, and crisis); confounding events; and alternative measures of key variables (discretionary LLP, culture) used in the empirical analysis. Our main findings remain valid and robust to all these tests.

We contribute to literature, which evaluates the role of organizational culture in banking. Fiordelisi and Ricci (2014) suggest that organizational culture mitigates the impact of corporate performance on CEO turnover because firms having different cultures react differently to poor performance and consequently experience different CEO turnover rate. Using granular loan-level data, Nguyen et al. (2019) find that organizational culture affects bank risk taking which, in turn increases systemic risk. Barth and Mansouri (2021) show that organizational culture affects compensation, stock performance and the probability of bank failure. We complement these studies by showing that organizational culture affects discretionary loan loss provisioning, which reduces bank transparency and the usefulness of accounting information produced by banks for external stakeholders (including shareholders and regulatory agencies tasked with supervising banks). Moreover, the results of this study establish an empirical link between organizational culture and supervisory enforcement actions. Given that organizational culture cannot be regulated ex-ante, this finding suggests that supervisory sanctions are an important disciplining mechanism in motivating banks to establish organizational cultures that are resilient to sudden changes in the industry environment.

Second, we contribute to the broad literature on earnings management and bank loan loss provisioning. This literature documents that while loan loss provisions should reflect

expected losses, they are often used opportunistically by banks to achieve managerial objectives such as: smoothing earnings (Kanagaretnam et al., 2004); signalling private information to outside stakeholders (Wahlen, 1994); and managing regulatory capital (Ahmed et al., 1999). We contribute to this literature by documenting that earnings management behaviour varies with organizational culture. In relation to counterparts with control- and collaborate-dominant cultures, banks with create- and compete-dominant organizational cultures are more likely to engage in discretionary loan loss provisioning to smooth earnings and signal private information to outsiders.

Finally, we contribute to the substantial literature which evaluates the impact of US banking deregulation on banks and the real economy.[3] Studies that investigate the impact of competition on loan loss provisions provide mixed results. Some show that banks exercise discretion over loan loss provisions in response to higher pressure imposed by their competitors when the competition increases (Dou et al., 2018; Tomy, 2019). In contrast, others suggest that competition disciplines managers from pursuing aggressive use of discretionary loan loss provisions (Jiang et al., 2016). We extend this literature by considering the role of organizational culture in the link between competition and loan loss provisions. We show that organizational culture is a mechanism through, which competition manifests itself to influence loan loss provisioning behaviour.

The rest of this study is structured as follows. Section 2 reviews related literature and presents testable hypotheses. In section 3, we discuss the data and methods. Section 4 presents the empirical results, while sections 5 and 6 provide additional analyses. Section 7 draws conclusions.

## 2. Theoretical concepts and related literature

*Organizational culture: conceptual foundations*

Organizational culture embodies a set of assumptions, beliefs, values, and norms that shape the ways in which a firm conducts its business (O'Reilly and Chatman, 1996). Within an organization, culture can be partitioned into three layers, comprising: underlying assumptions; espoused beliefs and values; and artefacts (Schein, 1985). Underlying assumptions are the core

---

[3] This line of research (as reviewed in Berger et al. 2020) suggests that bank deregulation leads to: state-level economic growth (Jayaratne and Strahan, 1996); increased access to finance and market entry by small firms (Cetorelli and Strahan, 2006); increased credit supply (Favara and Imbs, 2015); reduced cost of credit (Rice and Strahan, 2010; Levine et al., 2021); increased voluntary information disclosures (Burks et al., 2018); reduced bank failure; improved bank profitability (Goetz, 2018); increased wages for workers (Beck et al., 2010); increased corporate productivity (Krishnan et al., 2015), investment (Zarutskie 2006), and innovation (Cornaggia et al., 2015).

layer of organizational culture, which forms the basis for collective action. Values and beliefs represent a set of norms and operational rules such as strategies, goals, policies, and philosophies shared by members. While basic assumptions and beliefs tend to be more invisible, artefacts are comprised of visible, audible, and perceptible phenomena such as language and technology, which can be considered as a cultural artefact in which corporate values and basic assumptions are reflected.

The extent to which organizational culture evolves over time has been subject to debate, in large part stemming from conflicting perspectives regarding whether there is one overarching culture or various subcultures within an organization. The monolithic view suggests that organizational culture is harmonious and homogenous, and does not readily change (Martin, 1992). In contrast, the differentiation view believes that there are multiple sub-cultures that co-exist within an organization (Meyerson and Martin, 1987). In this paper, corporate culture is conceptualized from a differentiation perspective. Subcultures can compete with others and become dominant in the short term when organizations face significant industry change.

*Measuring organizational culture: The Competing Values Framework (CVF)*

Based on prior theoretical insights (Schein, 1985; Meyerson and Martin, 1987), the CVF (which is used in the present study) measures organizational culture by applying textual analysis to the annual reports of publicly listed banks (Cameron et al., 2006; Hartnell et al., 2011). Under the CVF, there are four organizational cultures, comprising create, compete, control, and collaborate (Figure 1).

[Insert Figure 1 around here]

*Control*-dominant culture value precise communication, formalisation, and routinisation. Organizations exhibiting a control-dominant culture perceive that an internal focus with a well-controlled mechanism (which clearly identifies roles, responsibilities, and procedures in accordance with formal rules and legislation) is crucial for value creation. Organizations with a *collaborate*-dominant culture perceive that a more flexible internal organizational structure, which encourages trust, collaboration, open communication, and decentralised decision-making, is more effective at driving values. In this regard, a collaborative culture can facilitate commitment incentives among internal members and create a sense of ownership and responsibility (Hartnell et al., 2011).

Organizations with a *compete*-dominant culture are focused on the external environment in pursuit of operational objectives (Hartnell et al., 2011; Fiordelisi et al., 2015). Such organizations focus on outperforming rivals and reward employees that contribute to this mission. However, this practice can accelerate distrust among employees, and lead to individualistic pursuit of self-serving goals (Hartnell et al., 2011). In a similar vein, organizations with *create*-dominant cultures focus on the external environment. The create-dominant culture encourages employees of the organization to react to changes in the external environment in an innovative and flexible manner (Hartnell et al., 2011; Cameron et al., 2006). Organizations with a create-dominant culture exhibit more willingness to reach beyond conventional norms and rules in pursuit of organizational goals (Fiordelisi et al., 2015). It is worth noting that, while these cultures have different assumptions, beliefs, values, behaviours, and effective criteria (Figure 2), they may co-exist and complement each other within an individual organization (Hartnell et al., 2011). Prior studies document a significant impact of organizational culture on corporate performance, CEO behaviour and bank risk (Hartnell et al., 2011; Fiordelisi and Ricci, 2014; Nguyen et al., 2019).

[Insert Figure 2 around here]

*Loan loss provisioning*

Bank loan loss provisioning has been studied extensively in the academic literature.[4] Evidence suggests that banks utilise loan loss provisions to manipulate capital, smooth earnings, and signal private information to the outsiders (Ahmed et al., 1999; Kanagaretnam et al., 2004; Leventis et al., 2011; Curcio and Hasan, 2015). Given that loan loss provisions are included in the calculation of regulatory capital, the capital management hypothesis predicts that banks with lower regulatory capital level can increase loan loss provisions to boost capital (Beatty et al., 1995). Kim and Kross (1998) and Ahmed et al. (1999) provide support for this proposition and document a negative association between bank capital and loan loss provisions.

---

[4] Results emanating from this evidence base suggest that: fluctuations in the business cycle (El Sood, 2012); institutional arrangements (Fonseca and González, 2008); prudential supervision (Osma et al., 2019); regulatory pressure (Ahmed et al., 1999; Hamadi et al., 2016); and product market competition (Jiang et al., 2016) all affect bank loan loss provisions. Moreover, evidence pertaining to the internal dynamics of banks suggests that: ownership concentration (Bouvatier et al., 2014) and equity incentives of bank managers (Alhadab and Al-Own, 2019) are positively associated with discretionary loan loss provisions. While this evidence base provides valuable insights into underlying factors in driving bank loan loss provisioning it neglects the role of organizational culture. This is surprising given the importance ascribed to organizational culture in various academic and regulatory discussions (Group of Thirty, 2015; Song and Thakor, 2019).

Nevertheless, capital management via loan loss provisioning appears to be prominent only in the period prior to the introduction of the 1988 Basel Capital Accord. Studies using data after the implementation of the Basel Capital Accord find little support for the capital management hypothesis (Leventis et al., 2011). This is partly because the Basel Accord excluded loan loss provisions from the computation of primary (Tier 1) capital, although some allowance towards Tier 2 capital up to the limit of 1.25% of risk-weighted-assets was permissible (Curcio and Hasan, 2015). To that extent, increased loan loss provisions could lower the Tier 1 capital via a reduction of reported earnings yet boost Tier 2 capital via higher loan loss reserves. Banks can also use loan loss provisions to smooth earnings reported to regulators and market participants (Collins et al., 1995). Specifically, banks can smooth earnings by understating loan loss provisions when future earnings are perceived to be low, and vice-versa (Kanagaretnam et al., 2004)

Banks may also use loan loss provisions to convey private information regarding future performance to outsider stakeholders (Curcio and Hasan, 2015). Given that loan loss provisions should reflect future credit losses, they are likely to have a positive association with market returns (Liu and Ryan, 1995; Kanagaretnam et al., 2009). From the point of view of market participants, an increase in loan loss provisions does not necessarily reflect a negative financial outlook with anticipated losses. Instead, a higher level of reported loan loss provisions may be construed as good news, implying that banks have made sufficient provision to cover future loan losses (Wahlen, 1994; Curcio and Hasan, 2015). Consistent with this proposition, evidence suggests that undercapitalised banks have more incentive to signal good news through loan loss provisions (Liu and Ryan, 1995; Liu et al., 1997; Kanagaretnam et al., 2009).

*Competition, culture, and loan loss provisioning*

A sudden change in competition may lead to increased entry of new firms with subsequent pressure on the margins of incumbent firms.[5] When facing increased competitive pressure, banks are likely to respond differently based upon their organizational culture (Schein, 1985, Murphy, 1989). For that reason, when competition increases, the impact on loan loss provisioning is dependent on the prevailing organizational culture at banks.

Prior evidence suggests that banks with compete- and create-oriented organizational cultures are more reactive to external shocks relative to counterparts with control and

---

[5] Prior evidence suggests that competition affects bank capital structure (Allen et al., 2011), customer orientation (Degryse and Ongena, 2007), and bank stability (Goetz, 2018). Dick and Hannan (2010) and Degryse et al. (2019) provide extensive reviews of the bank competition literature.

collaborate cultures (Fiordelisi et al., 2015). Given that the discretionary use of loan loss provisions can attract additional regulatory scrutiny, the way banks respond to changes in competition stems largely from attitudes to risk. Arguably, since compete- and create-dominant banks have a culture leaning towards aggressive attitudes and risk-taking, they may have an incentive to manipulate provisions aggressively to achieve organizational objectives (Nguyen et al., 2019). By contrast, banks with control- and collaborate-dominant organizational cultures share a focus on safety and compliance, and consequently embrace compliance with rules, and thus may be more reluctant to manipulate loan loss provisions. Based upon insights from the literature, we offer two hypotheses regarding the effect of organizational culture on bank loan loss provisions following increased competition as follows:

H1a: Banks with *control-* and *collaborate-dominant* organizational cultures are *less* likely to exercise discretion over loan loss provisions when there is an increase in competition.

H1b: Banks with *create-* and *compete-dominant* organizational cultures are *more* likely to exercise discretion over loan loss provisions when there is an increase in competition.

## 3. Variables and Data

*Sample*

We construct our sample using publicly listed US bank holding companies. The choice of this sample is motivated by the conventional view that organizational culture permeates an entity in a top-down fashion. We use the annual data of publicly listed BHCs over the period 1994 to 2006. This time window is chosen because 1994 was the year in which the IBBEA was enacted. Only publicly listed banks are considered, given that these are required by the US Securities and Exchange Commission to file 10-K reports that provide an overview of financial performance. We collect financial data from FRY-9C forms (Call reports) filed by banks at the consolidated level. Macroeconomic variables are collected from the Bureau of Economic Analysis. Given that the calculation of discretionary loan loss provisions requires both the lead and lags of selected variables, we only include banks with data spanning at least three consecutive years. In order to address any potential concerns that our results could be driven by outliers, we also winsorise continuous variables at the $1^{st}$ and $99^{th}$ percentiles of their respective distributions. The final sample comprises 370 BHCs with 2,625 bank-year observations.

*Measuring organizational culture*

In order to quantify the four cultures underpinning the CVF, we follow established practice (Fiordelisi and Ricci, 2014; Fiordelisi and Ricci, 2021; Nguyen et al., 2019). Accordingly, we apply textual analysis to the annual reports of individual banks to capture organizational culture. Compared to other methods used in prior studies of organizational culture, textual analysis has at least two advantages.[6] First, it can be applied systematically to a large dataset of organizations. Second, it can attenuate concerns associated with subjective judgements made by researchers and research subjects, which in turn can lead to measurement error and unreliable results.

To implement the textual analysis, we first identify a set of keywords that reflect each culture. We then calculate the frequency of keyword appearances in annual reports. To avoid subjectivity, we follow a procedure, which utilises a set of unique synonyms for each culture drawn from the Harvard-IV-4 Psycho-Social Dictionary (Fiordelisi and Ricci, 2014; Fiordelisi and Ricci, 2014; Fiordelisi et al., 2016; Nguyen et al., 2019). The Harvard-IV-4 Psycho-Social Dictionary is one of the most respected sources for word classification (Loughran and McDonald, 2011). The set of keywords used is provided in Figure 3.


[Insert Figure 3 here]


Once a set of keywords have been identified, we then manually retrieve all an individual bank's annual reports. In the US, the federal securities laws mandate publicly listed companies (including banks) to disclose financial information on an annual basis via a 10-K form to the Securities and Exchange Commission (SEC). We retrieve all 10-K reports from the SEC Edgar website over the period from 1994 to 2006. We identify the organizational cultures of each bank based upon the frequency that each set of synonyms associated with each culture appears in the text of a given 10-K report. The final score for each culture is computed as the number of times that keywords (or synonyms) appear in the 10-K, scaled by the total number of words in the document (excluding tables, exhibits and special characteristics). For example, if a bank has 324 control-related words, 675 collaborate-related words, 390 compete-related words and 251 create-related words, appearing in a 28,197-word 10-K report, then the raw scores for its

---

[6] Prior literature used several different approaches to quantify culture ranging from annual rankings of organizations, laboratory experiments, interviews, questionnaires to surveys (Guiso et al., 2015; Jones, 2005).

control, collaborate, compete, and create cultures will be 0.011, 0.024, 0.014 and 0.009, respectively. We follow the literature to include only one filing per bank per calendar year and exclude all 10-K filings with fewer than 2,000 words (Nguyen et al., 2019).

Prior studies employing the CVF to measure bank culture either use the raw culture score (absolute-raw-score approach) of an individual bank (Fiordelisi and Rici, 2014; Fiordelisi et al., 2015) or a bank culture score relative (relative-to-peer approach) to its peer group (Fiordelisi et al., 2016; Nguyen et al., 2019). The absolute-raw-score approach uses scores calculated each year from annual reports. The relative-to-peer approach identifies bank culture by comparing a bank's culture score to that of other banks (either in the same year or over several years). In the present study, we follow Fiordelisi et al. (2016) and use the latter approach given that raw culture scores tend to fluctuate depending on the length of an annual report each year. Raw scores can also be contaminated by random events specific to an individual bank (Nguyen et al., 2019).

The time-varying measure of organizational culture is motivated by the view that there are likely to be sub-cultures co-existing within an individual bank (Meyerson and Martin, 1987). These sub-cultures compete for dominance leading to an evolution in organizational culture, particularly when there are significant industry changes (Fiordelisi et al., 2016). This time-varying treatment of organizational culture allows us to include bank fixed effects (to capture unobservable bank characteristics) in our estimable models (Fiordelisi et al., 2015).[7] Specifically, the organizational culture of a bank each year is identified by comparing its scores in each of the four cultural orientations with all other banks in the same year. If an orientation lies in the top quartile of all banks in a given year, that cultural orientation is classified as dominant.

*Measuring bank competition*

We exploit the staggered deregulation of interstate bank branching, enabled when the US Congress passed the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) in 1994. The IBBEA legalised the state-wide branching and interstate that spread across the United States in the 1980s (Jiang et al., 2016; Burks et al., 2018). While the IBBEA eased federal restrictions on interstate banking (Section 101) and branching (Sections 102 and 103),

---

[7] This time-varying treatment of culture is also consistent with the data. Table A1 in the Appendix provides examples of the evolution of the organizational culture over the sample period from 1994 to 2006. Huntington Bancshares, for example, has create-dominant culture in 1994, but no dominant culture in 1995. This bank's culture changes to control-dominant in 1996, and then collaborate-dominant in 1998 before reverting back to control-dominant in 1999.

it also granted individual states the discretion to impose restriction(s) at any time between the enactment date in 1994 and the trigger date of 1997. Accordingly, individual states used discretion to block some or all out-of-state entries by imposing one or all of the following restrictions: setting the minimum age of three years on target institutions; imposing a maximum state-wide deposit cap of 30% on branch acquisitions; prohibiting de novo interstate branching; banning out-of-state banks from acquiring individual branches.[8] Moreover, US states could continue to amend regulations on interstate branching after the 1997 trigger date. Indeed, fifteen states revised requirements between 1997 and 2005.

As a result, the process of interstate banking deregulation was staggered across both states and time (Rice and Strahan, 2010). More importantly, the deregulatory changes were influenced by a political process, which was enacted at the state level and unanticipated by banks, and so should have no impact on banks' prior or intended future loan loss provisioning (Dou et al., 2018). These unique features of interstate branching deregulation under the IBBEA constitute a quasi-natural experiment, which allows us to explore the impact of organizational culture on bank behaviour.

Extant literature has exploited the variations in the timing and intensity of interstate deregulation across the US to construct a measure of bank competition. This literature starts with Rice and Strahan (2010) who create a competition (deregulatory) index that captures the staggered changes in interstate branching restrictiveness across states. The index has a value ranging from zero to four, with zero assigned to the most competitive states and four assigned to the least competitive states. The competitiveness of individual states is based on the number of restrictions imposed on bank branching. For example, if a state decided to impose none of the four restrictions, they are considered as a state that is most open for competition, and the competitive score for that state is zero. On the other hand, if the state decided to prohibit interstate branching completely by imposing all four of the restrictions, then the state is considered as being one of the least competitive states, and thus, the state's competitive index would take the value of four. To facilitate the interpretation, many subsequent studies re-scale the index so that zero indicates the least competitive states and four indicates the highest level of competition where all the four restrictions are removed.

Despite its widespread use in empirical banking research, this method is not free from concerns. The main concern is that, while banks cannot circumvent the restrictions on single branch acquisition and deposit caps, they can easily circumvent the restrictions on age and *de*

---

[8] See Johnson and Rice (2008), among others, for detailed discussions.

*novo* interstate branching (Johnson and Rice, 2008). The effect of branching deregulation can therefore be subsumed to those of single branch acquisitions and deposit caps. Johnson and Rice (2008) also provide support for this view and demonstrate that a requirement on the minimum age of the target institution and de novo interstate branching did not significantly lead to out-of-state branch expansion. For this reason, Nguyen et al. (2018) introduce a slightly modified version of Rice and Strahan's index to obtain a more accurate measure of the level of competition. They construct a Competitive State (*CS*) dummy that takes the value of one if a given state allows the acquisition of a single branch and does not impose a deposit cap of 30% or lower, and zero otherwise. We also apply the similar method in the present study. Thus, in our context, a zero value for the *CS* dummy would indicate the least competitive states, whereas a value of one indicates a highly competitive state. We also use the Rice and Strahan index as a robustness test and obtain similar results to our baseline estimates.[9]

*Measuring discretionary loan loss provisions*

We measure discretionary loan loss provisions applying a commonly used model in the accounting literature (Wahlen, 1994; Beatty and Liao, 2014). Specifically, discretionary loan loss provisions are estimated by decomposing total loan loss provisions into non-discretionary and discretionary components. Discretionary loan loss provisions are the absolute values of the residuals generated from Equation (1). In order to capture the effects of competition, we also incorporate a competition indicator and interact this competition indicator with all regressors, following Jiang, Levine and Lin (2016). This inclusion allows us to reduce the possibility that the residuals simply reflect a change in the accuracy of the model rather than a change in discretionary loan loss provisions.

$$LLP_{ijt} = \alpha_1 \Delta NPA_{ijt-1} + \alpha_2 \Delta NPA_{ijt} + \alpha_3 \Delta NPA_{ijt+1} + \alpha_4 \Delta Loan_{ijt} + \alpha_5 \Delta LCO_{ijt}$$
$$+ \alpha_6 Size_{ijt} + \alpha_7 CS_{jt} + \alpha_8 CS_{jt} * \Delta NPA_{ijt-1} + \alpha_9 CS_{jt} * \Delta NPA_{ijt} + \alpha_{10} C_{Sjt} * \Delta NPA_{ijt+1} +$$
$$\alpha_{11} CS_{jt} * \Delta Loan_{ijt} + \alpha_{12} CS_{jt} * \Delta LCO_{ijt} + \alpha_{13} CS_{jt} * Size_{ijt} + \gamma_t + \varepsilon_{ijt} \quad (1)$$

---

[9] Table A2 in the Appendix presents the timing of interstate branching deregulations from 1994 to 2004. The competition level (Nguyen et al., 2018) after deregulation in each state used in the main analysis, is included. The competition index constructed by Rice and Strahan (2010), used as an alternative measure of competition in the robustness test, is also included.

where $i$, $j$ and $t$ denote bank, state and year, respectively. $LLP_{ijt}$ is total loan loss provisions scaled by lagged total loans.[10] $\Delta NPA_{ijt}$ denotes the change in total non-performing assets between year $t$ and $t$-$1$ scaled by lagged total assets. We also include the last-period, $\Delta NPA_{ijt-1}$, and the next-period, $\Delta NPA_{ijt+1}$, the change in total non-performing assets in the model because banks might use historical and forward-looking information on non-performing assets to set loan loss provisions (Bushman and Williams, 2012). $\Delta Loan_{ijt}$ denotes the change in total loans between year $t$ and $t$-$1$ scaled by lagged total loans. $\Delta LCO_{ijt}$ denotes the change in total loan charge-offs between year $t$ and $t$-$1$ scaled by lagged total assets. $Size_{ijt}$ is the natural logarithm of total assets.

$CS_{jt}$ indicates competitive state and is a dummy that equals one if a state allows for the acquisition of a single branch and does not impose a deposit cap of 30% or lower in a given year, and zero otherwise. $CS_{jt}$ is interacted with all the other variables to allow for the competition to alter the entire discretionary loan loss provision model after a regulatory change in a given state in a given year. $\gamma_t$ is the time fixed effect. $\varepsilon_{ijt}$ is the residual and is the main variable of interest, which reflects discretionary loan loss provisions beyond those accounted for by the regressors included in Equation (1). Given that the residual can be positive or negative, we take the absolute value of the residual to capture the magnitude of discretionary loan loss provisions. In a series of robustness tests (discussed in section 4), we execute several alternative models, which verify the reliability of our main findings.

*Summary statistics*

Table 1, Panel A, presents summary statistics (after dropping observations with missing values) of variables used in the first stage of our empirical analysis. For discretionary loan loss provisions, the mean value is 2.199, indicating a tendency for banks to provisioning above and beyond that accounted for by the explanatory variables in Equation (1). The average change in total loans ($\Delta Loan$) scaled by lagged total assets is 0.144. An average bank has \$5.6 billion in total assets, which translates to 14.089 when taking the natural logarithm of total assets ($Size$) to smooth out the skewed distribution of bank size for analysis. The average staggered competitive state ($CS$) is 0.545.

---

[10] In order to avoid extremely small coefficients, we have rescaled the (loan-loss-provision-to-lagged-assets) dependent variable in the first stage regression in order to derive the (discretionary-loan-loss-provision) dependent variable in the second stage regression. Specifically, we follow Dou et al. (2018) and transform loan-loss-provision-to-lagged-assets (LLP) to loan-loss-provision multiplied by 1000 all divided by lagged assets for easier interpretation of the coefficients of the key variables of interest.

Table 1, Panel B, reports summary statistics of cultures and additional variables used in the second stage of the empirical analysis. The main variable in this stage is organizational culture. As shown in Panel B, the mean values of the four cultural variables (control-dominant, collaborate-dominant, compete-dominant, and create-dominant) are similar (0.253, 0.252, 0.265 and 0.249, respectively). This suggests that no organizational culture is dominating in the sample. A bank in the sample has an average of more than 13 years in operation up to 2006 (the last year of the sample period). The average ratio of non-performing to total assets is 0.005. The average bank profit before tax (EBTP) and after tax (ROA) is 1.63% and 1.19%, respectively. The yearly change in total deposits is 0.128 and, on average, a bank has a capital ratio of 9%.

[Insert Table 1 here]


Table 2 presents additional statistics. Panel A reports a statistical breakdown of the main variables of interest by organizational culture, while Panel B illustrates the evolution of culture values over time. Panel C provides examples of banks in each organizational culture category. As shown in Panel A, there are no significant differences in the characteristics of banks with different types of culture.


[Insert Table 2 here]


## 4. Organizational culture and bank use of discretionary loan loss provisions


*Model specification*

We exploit the staggered US bank branching deregulation as a quasi-natural experiment and construct a model which is similar in spirit to that of Rice and Strahan (2010) and Nguyen et al. (2018) to examine the impact of organizational culture on bank discretionary loan loss provisions. In order to do so, we compare the extent to which banks located in states with more competition exercise discretion over loan loss provisions relative to counterparts located in states with less competition. We estimate the following difference-in-differences model:


$$Discretionary\ LLP_{ijt} = \beta_1 Culture_{ijt} * CS_{jt} + \beta_2 Culture_{it} + \beta_3 CS_{jt} + X_{ijt} + \delta_i + \gamma_t + \varepsilon_{ijt} \quad (2)$$

where $i$, $j$ and $t$ denote bank, state, and year, respectively. $Discretionary\ LLP$ is discretionary loan loss provisions measured by the absolute value of the residual estimated from Equation (1) for bank $i$, headquartered in state $j$, in year $t$. $Culture_{ijt}$ is a dummy that equals one if the frequency of key words associated with each of the four cultures (control-dominant, collaborate-dominant, compete-dominant, and create-dominant) for a bank in a given year is in the top quantile among all banks, and zero otherwise. $CS_{jt}$ indicates competitive state and is a dummy variable that equals one if a state allows for the acquisition of a single branch and does not impose a deposit cap of 30% or lower, and zero otherwise.

$X_{ijt}$ denotes a set of bank-level and macro-level control variables widely used in the literature to explain bank discretionary loan loss provisions (Hamadi et al. 2006; Kanagaretnam et al., 2009; Bushman and Williams, 2012; Jiang et al., 2016; Dou et al., 2018). To control for variation in bank level characteristics, we include bank size, age, asset quality, profitability, capital, loan and deposit growth. To control for macro-level time-variant economic factors, we add state level GDP and population growth to Equation (2). We lag all control variables for one year to mitigate concerns regarding endogeneity. All regressions include bank fixed effects ($\delta_i$) and year fixed effects ($\gamma_t$). $\varepsilon_{i,t}$ is the error term clustered at the state level.

The coefficient, $\beta_1$, the interaction term between organizational culture and competitive state in Equation (2), is our main variable of interest. This coefficient captures the difference in discretionary loan loss provisions between banks with a dominant culture (control-, collaborate-, compete- and create-) and those without before and after state level deregulation. A positive and statistically significant $\beta_1$ would suggest that banks with a dominant organizational culture increase discretionary loan loss provisions following an increase in competition. A negative and statistically significant $\beta_1$ would suggest the opposite.

*Broad organizational culture orientation and discretionary LLP*

The CVF classifies four organizational cultures into two categories, comprising: internally focused (control- and collaborate-oriented) and externally focused (create- and compete-oriented). The two externally focused organizational cultures both focus on growth. Banks belonging to these two external cultures place an emphasis on risk-taking, adaptability and competitiveness. On the other hand, the two internally focused cultures both focus on safety. These banks place an emphasis on predictability, compliance, and safety (Hartnell et al., 2011; Nguyen et al., 2019). Given that the two internal (external) organizational cultures share important characteristics, we aggregate them to internal and external dimensions

(following Barth and Masouri, 2021 and Fiordelisi et al., 2015) in the initial stage of the empirical analysis. We expect that banks with an organizational culture within the same internal or external dimension should exhibit similar loan loss provisioning behaviour. Therefore, we commence our empirical analysis by first examining the two broader organizational cultures, comprising: *internally*-dominant (control and collaborate-) versus *externally*-dominant (create and compete).

A bank is considered as having an *internally*-dominant culture, which takes a value of 1 if both control and collaborate cultural scores are among the top quantile of all banks in a given year, and 0 otherwise. Meanwhile, a bank is classified as having an *externally*-dominant culture, which takes the value of 1 if both compete and create cultural scores fall in the top quantile of all banks in a given year, and 0 otherwise. We use this definition of culture and estimate the impact of organizational culture on discretionary loan loss provisions using Equation (2). Table 3 presents the regression results. Column (1) shows the impact of internally-dominant culture. Column (2) is the externally-dominant culture and Column (3) includes both internally-dominant and externally-dominant cultures in one regression.


[Insert Table 3 around here]


The results presented in Table 3 suggest that banks with an externally oriented organizational culture are more likely to utilize discretionary loan loss provisions when competition increases. In contrast, banks with an internally oriented organizational culture are less likely to utilize discretionary LLPs in response to an intensification of industry competition. The coefficients on the interactions between culture and competition are statistically and economically significant. For example, the coefficient on the internal-dominant and competition interaction variables in Column (1), indicates that banks with an internally oriented organizational culture reduce discretionary loan loss provision by 18% when competition increases.[11] The coefficient on the external-dominant and competition interaction variable in Column (2), on the other hand shows that banks with an externally focused culture increase discretionary loan loss provision by 29% compared to banks with other organizational cultures.

---

[11] 18% = -0.391 / 2.163 (the coefficient of the interaction term between culture and competition divided by the mean value of discretionary loan loss provision).

The contrasting loan loss provisioning behaviour of banks confirms the important role of organizational culture. Our results are consistent with prior evidence, which suggests that internally-dominant (control and collaborate) organizational cultures focus on internal dynamics and are less reactive to changes in the external environment (Hartnell et al., 2011; Fiordelisi et al., 2015). In contrast, externally-dominant organizational cultures (the compete- and create-culture) share a risky attitude and have a strong orientation towards growth (Fiordelisi et al., 2015; Nguyen et al., 2019). Banks with an externally-dominant organizational culture are more cognisant of changes in the external environment when formulating strategy (Cameron et al., 2006; Fiordelisi et al., 2015). Thus, these banks tend to engage in risk-taking behaviour in order to achieve short- and immediate-term growth (Fiordelisi et al., 2015).

*Baseline results: specific cultures and discretionary LLP*

In the main analysis, we separate the externally focused organizational culture into create- and compete-oriented, in order to capture the potential differences in discretionary loan loss provisioning. Despite a focus on growth, the create-oriented culture is associated with continuous change, entrepreneurship, and vision, while the compete-oriented culture is associated with aggressive and rapid responses to changing circumstances. These differences between the two externally focused organizational cultures could lead to one type of culture within the external dimension impacting bank behaviour to a greater extent than the other, which unfortunately is unobservable when the two cultures are aggregated. In similar fashion, there are differences between the two internally focused cultures despite a common focus on safety. The control-oriented culture is associated with capable processes, predictability, and control. In contrast, collaborate-oriented culture is associated with employee development and empowerment (Cameron et al., 2006; Nguyen et al., 2019).

The differences between the two external organizational culture (compete- and create-oriented) are expected to affect the magnitude of the impact of bank culture on loan loss provisioning behaviour. However, the direction of the impact induced by the two cultures should not differ due to a common growth focus. In other words, banks with compete- and create-oriented organizational cultures are more likely to take risk and utilize discretionary loan loss provisions. Consequently, the sign of the coefficients of the two interaction terms (compete-dominant*CS and create-dominant*CS) should be the same (positive). Accordingly, we run Equation (2) separately for each of the four dominant organizational cultures. The results are reported in Table 4.

Columns (1) to (4) of Table 4 represent the results of the impact of control-, collaborate-, compete- and create-dominant organizational cultures on discretionary loan loss provisioning. Column (5) of Table 4 shows the regression results when all four cultures are included. We find that collaborate-dominant banks (which value clearly identified roles, responsibilities, and procedures in accordance with formal rules and legislation) are less likely to utilise discretionary loan loss provisions. This finding confirms Hypothesis H1a. The coefficients of the interaction term, collaborate-dominant*CS, is negative and statistically significant, which suggests that banks with collaborate-dominant culture reduce discretionary loan loss provisions by 16.5% relative to other banks.

On the other hand, the coefficients of compete-dominant*CS (Column (3)) and create-dominant*CS (Column (4)) are positive and strongly significant. These results support Hypothesis H1b. The results in Column (5), in which all culture types are included in one estimation, allow us to compare (loosely) the extent to which each culture within the external dimension separately affects loan loss provisioning behaviour. The magnitude of the two relevant coefficients in Column (5) of Table (4) suggest that banks with compete-dominant culture increase discretionary loan loss provisions by 28.7%, while counterparts with a create-dominant culture increase discretionary loan loss provisions by 27.7%. This suggests that the compete-dominant culture is slightly more important in driving the effects within the external cultural dimension. This is consistent with the view that banks with a compete-dominant culture are more aggressive in pursuing growth relative to counterparts with a create-dominant culture (Cameron et al., 2006; Hartnell et al., 2011; Nguyen et al., 2019).

It is worth noting that in most of the results presented, the coefficients on the interactions between organizational culture and competition have opposite signs to the coefficients on the stand-alone organizational culture variables. For example, the coefficients on create- and compete-dominant organizational cultures are negative, while their respective interactions with competition are positive (presented in Table 4). These coefficients suggest that during normal market conditions, banks with create- and compete-dominant organizational cultures are less likely to utilize discretionary loan loss provisions. However, when competition increases, these banks become more likely to exercise discretion in loan loss provisioning. This reflects the moderating impact of competition on the link between culture and bank discretion in utilizing loan loss provisions and supports the use of IBBEA 1994 as a quasi-experimental research setting.

Regarding the control variables, non-performing assets (*NPA*) exhibit a positive relationship with discretionary loan loss provisions. This is consistent with the conjecture that banks with more non-performing assets are likely to utilise discretion over loan loss provisions to smooth earnings, given that non-performing assets are an early indication of loan defaults (Liu and Ryan, 2006). Loan growth (*ΔLoan*) exhibits a negative relationship with discretionary loan loss provisions. Incremental lending could increase loan defaults, leading to higher loan loss provisions. However, Keeton (1999) posits that loan growth being driven by demand side would reduce provisions. In contrast, deposit growth (*ΔDeposit*) shows a positive relationship with discretionary loan loss provisions. This is consistent with the view that deposit growth allows banks to lend more and could subsequently increase credit risk, leading to higher loan loss provisions (Allen et al., 2014). GDP growth reflects pro-cyclicality in discretionary behaviour (Leventis et al., 2011). Population growth implies that an increase in year-end market size could increase bank discretionary loan loss provisions (Dou et al., 2018). However, neither of these macroeconomic variables are significant.

*Robustness tests*

*Parallel trend assumption*

One critical prerequisite to ensure the validity of difference-in-differences estimation is that, in the absence of the treatment, the changes in the outcome variables for both treated and control groups exhibit a parallel trend. This is because the role of the control group is to provide the appropriate counterfactual of the trend that the treated group would have followed in the absence of treatment. Thus, the violation of this parallel trend assumption could lead to estimation bias because the estimated results are driven by permanent differences between two groups or other omitted factors. In the present setting, prior to the sudden increase in competition following deregulation, the discretionary loan loss provisions of treated and control banks exhibit a similar trend. The observation of such a similar trend in the period prior to the competitive shock (arising from deregulation) allows us to evaluate (the true counterfactual) what would have happened to banks' provisioning practices if deregulation (treatment) had never been increased.

To complement the parallel trend assumption, and to alleviate concerns that our results would be driven by omitted factors other than the state deregulation that occurred during the sample period, we follow Berger et al. (2017) and conduct two falsification tests - one with false event years and another with a false level of competitive intensity. Thus, if the estimated

treatment effect are statistically significant, our difference-in-difference estimates reported earlier are biased because of unobservable factors other than the deregulation.

[Insert Table 5 around here]

For the first falsification test, we randomly assign individual states into each of the deregulation years but keep their corresponding competitive values unchanged. For the second falsification test, we randomly assign states to the competitive values (ranging from zero to one) but keep the year of deregulation unchanged. The results of the first and second falsification tests are reported in Columns (1) and (2) of Table 5, respectively. Overall, none of the estimated treatment effects are statistically significant, thus adding further confidence in the parallel trend assumptions and the creditability of our original difference-in-difference results.

*Macroeconomic fluctuations*

To test the sensitivity of our main results regarding the impact of organizational culture and competition on banks' discretionary loan loss provisions, we conduct several robustness checks. The results of these tests are presented in Table 6. In order to control for pre-trends in the data, we retain bank fixed effects and replace year fixed effects with state-year trend fixed effects in the estimation and report the results in Column (1). Column (2) presents the results in which economic crisis years following the bursting of the dot com bubble (2000-2002) are excluded from the sample period to mitigate the concerns that changes in discretionary loan loss provisions we find are driven by the crisis. In Column (3), we incorporate additional time-varying variables that capture state-level economic conditions (income per capita and employment).

[Insert Table 6 around here]

*Alternative discretionary LLP and confounding events*

Next, we use an alternative specification to estimate discretionary loan loss provisions (DLLP) by adding state level GDP, employment, and population growth as well as their respective interaction with competition to Equation (1). This is to control for the impacts of the macroeconomic environment on loan quality (Jiang et al., 2016; Dou et al., 2018). We then use

this alternative DLLP as the dependent variable in Equation (2). The results are presented in Column (4), and consistent with the baseline findings.

Another potential problem is that the results might be driven by the state-level takeover laws enacted at the same time as the passage of branching deregulation. Therefore, we exclude banks incorporated in two states (Texas and Iowa) that enacted takeover laws, and report results that are consistent with the baseline findings   in Column (5) of Table 6.

*Reverse causality*

One may argue that DLLP at banks in a state could drive the state's decisions to deregulate the banking market. To mitigate this concern, we follow prior literature (Krishnan et al., 2015; Berger et al., 2017) and include *Pre1 (Pre2)* dummy variables in the model, which take the value of one for one (two) year prior deregulation in a given state. If reverse causality exists, the *Pre1* and *Pre2* coefficients should be statistically significant. However, this is not the case as shown in Column (6). Next, we use an alternative measure of bank competition using an index constructed by Rice and Strahan (2010), with values ranging from zero (least competitive state) to four (most competitive state). The results presented in Column (7) are consistent with the main findings.

*Augmented bag of words*

Another concern is that the keywords to capture organizational culture do not necessarily capture the specificities of the banking industry. In order to address this possibility, we follow Nguyen et al. (2019) and augment the bag of words to include potentially omitted words reflecting bank culture. These words (selected from the 2014 Financial Stability Board Guidance on Supervisory Interaction with Financial Institutions on Risk Culture)  include: sceptic*, skeptic*, whistleblow, compliance, risk culture, risk management, risk appetite, risk information, risk limit and control functions. Bianchi et al. (2016) suggest that banks which frequently mention these words in annual reports tend to lean toward a control-based organizational culture, and consequently have higher loan quality and less discretionary loan loss provisions. Therefore, we add these extra key words to the control-oriented bag and re-estimate the baseline model. The results (reported in Column 8 of Table 6) are consistent with the main findings.

*Aggressive lending*

It might be the case that following the Interstate Banking and Branching Efficiency Act 1994 (IBBEA), banks may choose to expand to other markets via aggressive lending. This could lead to changes in loan-loss provisioning behaviour and risk. In order to rule out this possibility, we explore the impact of the IBBEA on loan loss provisions (LLP) and non-performing loan (NPL). We re-estimate the baseline regression in Equation (2) with LLP and NPL as a dependent. If banks expand lending aggressively and consequently have to provision more for loan losses and incur higher non-performing loans, the coefficient on IBBEA*Post interaction should be positive and statistically significant. However, the reported results in Column (1) and (2) of Table A3 are not significant.

## 5. Organizational culture and incentives to utilise discretionary LLP

The results presented do suggest that organizational culture affects discretionary loan loss provisioning. In this section, we examine the motivations for utilising discretion over loan loss provisions by banks with different cultures when banks face more competitive pressure. Extant literature documents that banks can exercise loan loss provisions to smooth earnings, communicate private information regarding future earnings to outsiders and boost regulatory capital (Liu and Ryan, 1995; Collins et al., 1995; Liu et al., 1997; Kanagaretnam et al., 2004; Kanagaretnam et al., 2009; Curcio and Hasan, 2015).[12]

*Organizational culture and income smoothing*

As discussed previously, banks can use loan loss provisions to smooth incomes in order to meet expectations of shareholders and equity analysts (Collins et al., 1995; Kanagaretnam et al., 2004). They can also manage n overstate (understate) loan loss provisions in the periods of high (low) income, in order to smooth profitability, and improve market participants' risk perceptions.

In order to examine bank income smoothing behaviour via discretionary loan loss provisions, we amend the baseline model in Equation (2) and incorporate EBTP, measured as the ratio of earnings before tax and provisions to total assets, and its interaction with organizational culture and competitive state. A positive and significant coefficient on the interaction term would suggest income smoothing behaviour given that that banks overstate

---

[12] Earlier studies also suggest that banks can use loan loss provisions for capital manipulation purposes. However, after the Basel II took effect, researchers find no evidence of capital manipulation via loan loss provisioning. We tested the capital management hypothesis and found no evidence of capital management in the sample. The results are available upon request.

loan loss provisions when incomes are high and understate loan loss provisions when incomes are low. Specifically, Equation (2) is modified as follows:

$$Discretionary\ LLP_{i,t} = \beta_1 Culture_{i,t} * CS_{j,t} * EBTP_{i,t} + \beta_2 Culture_{i,t} +$$
$$+ \beta_3 CS_{j,t} + \beta_4 EBTP_{i,t} + X_{i,t} + \delta_i + \gamma_t + \varepsilon_{i,t} \quad (3)$$

Column (1) of Table 7 reports the regression results of the modified model in Equation (3). The estimated coefficient on *Collaborate-dominant\*CS\*EBTP* is negative and statistically significant. This suggests that following deregulation, banks with collaborate-dominant organizational cultures exhibit less income smoothing. We do not observe any significant evidence of income smoothing behaviour for banks with control-, compete- and create-dominant banks.

[Insert Table 7 around here]

*Organizational culture and signalling*

Prior literature documents a positive association between loan loss provisions and market returns even though loan loss provisions are expenses that should reflect future credit losses (Liu and Ryan, 1995; Kanagaretnam et al., 2004; Kanagaretnam et al., 2009). This is partly because market participants infer that banks convey good news when they increase discretionary provisions (Wahlen, 1994). To that extent, banks can manipulate loan loss provisions in order to alter market expectations regarding future income. Specifically, banks with undervalued equity may have a high incentive to overstate loan loss provisions in order to signal the positive future earnings prospects to the market.

In order to test for bank signalling behaviour through discretionary loan loss provisions, we amend the baseline model (2), and incorporate a variable reflecting the change in future earnings before tax and provisions (scaled by total assets) ($\Delta EBTP_{i,t+1}$), and its interaction term with organizational culture and competitive state one-year ahead. A positive and significant coefficient of the interaction term would indicate signalling behaviour. Specifically, model (2) is modified as follows:

$$Discretionary\ LLP_{i,t} = \beta_1 Culture_{i,t} * CS_{j,t} * \Delta EBTP_{i,t+1} + \beta_2 Culture_{i,t} + \beta_3 CS_{j,t}$$
$$+ \beta_4 \Delta EBTP_{i,t+1} + X_{i,t} + \delta_i + \gamma_t + \varepsilon_{i,t} \quad (4)$$

Column (2) of Table 7 reports the results. The estimated coefficient on *Create-dominant\*CS\*ΔEBTP$_{t+1}$* is positive and significant, thus indicating signalling behaviour. The positive coefficients in the case of create-dominant culture may imply that following shocks to industry competition, create-dominant banks have a greater incentive to exercise discretion over loan loss provisions in order to signal private information. The feasible explanation is that, since create culture tends to focus more on the external environment, these banks have a tendency to reach beyond the barriers to signal private information to the outsiders when they are under competitive pressure.

## 6. Organizational culture and supervisory enforcement

The results thus far illustrate that organizational culture exerts a significant impact on bank provisioning practices when banks operate under different competitive conditions. However, when banks manipulate accounting figures to distort economic performance and modify shareholder beliefs, they are likely to receive formal enforcement actions imposed by the industry regulators and supervisors (Dechow et al., 1996).

Given that organizational culture determines both the risk attitude and the morality of banks, we expect that banks with an organizational culture leaning toward compliance, cooperation, and safety (i.e. control- and collaborate-organizational cultures) are less likely to be subject to formal enforcement actions. On the other hand, banks with an organizational culture which encourages aggressive attitudes, competition and risk-taking are more likely to be subject to formal sanctions. To test these propositions, we utilise the following logit model:

$$\Pr(Enforecement_{i,t}) = \beta_1 Culture_{i,t} * CS_{j,t} + \beta_2 Culture_{i,t} + \beta_3 CS_{j,t} + X_{i,t} + \varepsilon_{i,t} \quad (5)$$

The dependent variable, $Enforcement$ is a dummy variable that equals one if a bank receives any of the formal enforcement actions imposed by three federal banking agencies: the Federal Reserve Board (FRB), the Federal Deposit Insurance Corporation (FDIC) and the Office of the Comptroller of the Currency (OCC) in a given year, and zero otherwise. Most notable formal enforcement actions include: cease-and-desist orders; written agreements; suspension, removal, and prohibition orders; civil money penalties; prompt corrective action directives; safety and soundness orders; and capital directives (Delis et al., 2019).

We follow the previous literature (Fiordelisi et al., 2015; Delis et al., 2019) and hand-collect data on supervisory enforcement actions from the FRB, FDIC, and OCC websites.[13] We can identify 344 bank-year observations that received at least one formal enforcement action over the period from 1994 to 2005. Other variables are defined as in Equation (2). The results of the model in Equation (5) are reported in Table 8.

[Insert Table 8 around here]

We find the evidence from banks having a create-dominant organizational culture are more likely to be punished by supervisors when they operate under an increasingly competitive environment, evidenced by the positive coefficients on *Create-dominant\*CS* in Columns (4) and (5). This result is in line with the proposition that create-dominant banks tend to break rules (Fiordelisi et al., 2015), and are therefore subject to more supervisory scrutiny and sanction.

## 7. Conclusion

In the aftermath of the 2007-2009 financial crisis, organizational culture and excessive competition were perceived as playing a significant role in the ethical failures, misconduct and instability observed across the banking industry. Despite this, there remains a paucity of research evidence regarding the impact of organizational culture on bank behaviour. In this study, we go some way to augmenting the evidence base, by investigating the impact of organizational culture on bank behaviour following a change in the competitive environment (brought about by the geographic deregulation of the banking industry).

We define organizational culture based upon the CVF and measure specific cultural values using textual analysis. Textual analysis captures the tone and sentiment of organizational culture embedded in the documents that banks use to communicate with outside stakeholders. Using textual analysis allows us to classify banks as having either a control-dominant, collaborate-dominant, compete-dominant, or create-dominant culture. To place our empirical investigation in context, we exploit a shock to industry competition (following US interstate bank branching deregulation) to investigate how different organizational cultures interact with changes in the external environment to influence the discretionary loan loss provisioning of banks

---

[13] Enforcement actions from FRB can be found at: https://www.federalreserve.gov/supervisionreg/legal-developments.htm ; FDIC: https://orders.fdic.gov/s/searchform; and OCC: https://www.occ.gov/topics/laws-and-regulations/enforcement-actions/index-enforcement-actions.html.

The results from an extensive difference-in-difference analysis suggest that organizational culture is important in shaping of loan loss provisioning at banks. As competition increases, banks with an organizational culture oriented toward safety, cooperation and compliance are less likely to exercise discretion over loan loss provisions. On the other hand, banks with an organizational culture which promotes aggressive rivalry and risk-taking are more likely to have the greater use of discretionary loan loss provisions.

Additional analyses of the incentives for banks to use discretionary loan loss provisions also reveal important insights. We find that collaborate-dominant banks are less likely to smooth earnings when competition increases. This is consistent with theory suggesting that collaborate-culture is centred around formal rules and legislation. We also find that create-dominant banks manipulate reports to signal private information to outsiders when they experience increased competitive pressure. Our results support the view that banks which have a create-dominant organizational culture have more incentives to participate in risk-taking and rule-breaking activities. This also partly explains why create-dominant banks are more likely to be punished by bank supervisors for misbehaviour when the competition increases. Overall, we offer a novel cultural-based explanation for variations in bank (loan loss provisioning) behaviour following industry deregulation and an intensification of competition. Our findings are thus of interest to regulators tasked with reforming and monitoring culture and behaviour at banks. Moreover, given that discretionary loan loss provisioning can increase bank opacity and present challenges to outsiders in accurately assessing the current and future financial condition of banks, our findings are also relevant for government agencies such as the FRB, the FDIC and the OCC) responsible for supervising bank behaviour.

**References**

Ahmed, A.S., Takeda, C. and Thomas, S., 1999. Bank loan loss provisions: a re-examination of capital management, earnings management and signalling effects. *Journal of Accounting and Economics.* 28(1), 1-25.

Alhadab, M. and Al-Own, B., 2019. Earnings management and equity incentives: evidence from the European banking industry. *International Journal of Accounting and Information Management.* 27(2), 244-261.

Allen, F., Hryckiewicz, A., Kowalewski, O. and Tümer-Alkan, G., 2014. Transmission of bank liquidity shocks in loan and deposit markets: The role of interbank borrowing and market monitoring. *Journal of Financial Stability.* 15, 112–126.

Allen, K. Carletti, E. and Marquez, R., 2011. Credit market competition and capital regulation. *Review of Financial Studies*. 24(4), 983–1018.

Barth, A. and Mansouri, S., 2021. Corporate culture and banking. *Journal of Economic Behavior and Organization*. 186, 46-75.

Beatty, A. and Liao, S., 2014. Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics*. 58(2-3), 339-383.

Beatty, A., Chamberlain, S.L. and Magliolo, J., 1995. Managing financial reports of commercial banks: The influence of taxes, regulatory capital, and earnings. *Journal of Accounting Research*. 33(2), 231-261.

Beck, T., Levine, R. and Levkov, A., 2010. Big bad banks? The winners and losers from bank deregulation in the United States. *Journal of Finance*. 65(5), 1637-1667.

Berger, A.N., Molyneux, P., and Wilson, J.O.S., 2020. Banks and the real economy: An assessment of the research. *Journal of Corporate Finance.* 62, 101513.

Berger, A.N., Öztekin, Ö. and Roman, R.A., 2017. How does competition affect bank capital structure? Evidence from a natural experiment. *Working Paper*.

Bianchi, N. Farina, V. and Fiordelisi, F., 2016. Risk culture in banks: just words? *Working Paper*.

Bouvatier, V. Lepetit, L. and Strobel, F., 2014. Bank income smoothing, ownership concentration and the regulatory environment. *Journal of Banking and Finance.* 41(2014), 253-270.

Burks, J.J., Cuny, C., Gerakos, J. and Granja, J., 2018. Competition and voluntary disclosure: evidence from deregulation in the banking industry. *Review of Accounting Studies*. 23, 1471–1511

Bushman, R.M. and Williams, C.D., 2012. Accounting discretion, loan loss provisioning and discipline of banks' risk-taking. *Journal of Accounting and Economics*. 54(1), 1-18.

Cameron, K.S., De Graff, J., Quinn, R.E. and Thakor, A., 2006. *Competing values leadership: creating value in organizations*. Cheltenham: Edward Elgar.

Cetorelli, N. and Strahan, P.E., 2006. Finance as a barrier to entry: Bank competition and industry structure in local U.S. markets. *Journal of Finance*. 61(1), 437-461.

Collins, J.H., Shackelford, D.A. and Wahlen, J.M., 1995. Bank differences in the coordination of regulatory capital, earnings, and taxes. *Journal of Accounting Research*. 33(2), 263-291.

Cornaggia, J., Mao, Y., Tian, X., Wolfe, B. 2015. Does banking competition affect innovation? *Journal of Financial Economics.* 115, 189-209.

Curcio, D. and Hasan, I., 2015. Earnings and capital management and signaling: the use of loan-loss provisions by European banks. *European Journal of Finance*. 21(1), 26-50.

Dechow, P.M. Sloan, R.G. and Sweeney, A.P., 1996. Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research*. 13(1), 1-36.

Degryse, H. Acevedo, P.M., and Ongena, S., 2019. Competition in the banking sector, in Berger, A.N., Molyneux, P., Wilson, J.O.S. (eds.), *Oxford Handbook of Banking*, 3rd ed. Oxford: Oxford University Press.

Degryse, H. and Ongena, S., 2007. The impact of competition on bank orientation. *Journal of Financial Intermediation*. 16(3), 399-424.

Delis, M.D. Staikouras, P.K. and Tsoumas, C., 2019. Supervisory enforcement actions and bank deposits. *Journal of Banking and Finance*. 106, 110–123.

Dick, A.A., and Hannan, T.H., 2010. Competition and antitrust in banking, in Berger, A.N., Molyneux, P., Wilson, J.O.S. (eds.). *Oxford Handbook of Banking*, 3rd ed. Oxford: Oxford University Press.

Dou, Y., Ryan, S.G. and Zou, Y., 2018. The effect of credit competition on banks' loan-loss provisions. *Journal of Financial and Quantitative Analysis*. 53(3), 1195-1226.

Doukas, J.A. and Zhang, R., 2021. Managerial ability, corporate social culture, and M&As. *Journal of Corporate Finance.* 68, 101942.

El Sood, H.A., 2012. Loan loss provisioning and income smoothing in US banks pre and post the financial crisis. *International Review of Financial Analysis*. 25, 64-72.

Favara, G. and Imbs, J., 2015. Credit supply and the price of housing. *American Economic Review*. 105(3), 958-992.

Fiordelisi, F. and Ricci, O., 2014. Corporate culture and CEO turnover. *Journal of Corporate Finance*. 28(C), 66-82.

Fiordelisi, F. and Ricci, O., 2021. Corrigendum to "Corporate culture and CEO turnover". *Journal of Corporate Finance.*

Fiordelisi, F., Li, K., Stentella-Lopes, S. and Ricci, O., 2016. Corporate culture and mergers and acquisitions. *Working paper*.

Fiordelisi, F., Renneboog, L., Ricci, O. and Lopes, S.S., 2019. Creative corporate culture and innovation. *Journal of International Financial Markets, Institutions and Money*. 63, 101137.

Fiordelisi. F., Raponi, J. and Rau, P.R., 2015. Corporate culture and enforcement actions in banking. *Working paper.*

Fonseca, A.R. and González, F., 2008. Cross-country determinants of bank income smoothing by managing loan-loss provisions. *Journal of Banking and Finance*. 32(2), 217-228.

Goetz, M.R., 2018. Competition and bank stability. *Journal of Financial Intermediation*. 35(A), 57-69.

Graham, J.R., Harvey, C.R. and Rajgopal, S., 2005. The economic implications of corporate financial reporting. *Journal of Accounting and Economics.* 40(1-3), 3-73.

Group of Thirty, 2015. *Banking Conduct and Culture: A Call for Sustained and Comprehensive Reform.* Monograph, Washington, D.C. (July).

Guiso, L. Sapienza, P. and Zingales, L., 2015. The value of corporate culture. *Journal of Financial Economics*. 117(1), 60-76.

Hamadi, M., Heinen, A., Linder, S. and Porumb, V., 2016. Does Basel II affect the market valuation of discretionary loan loss provisions? *Journal of Banking and Finance*. 70(2016), 177-192.

Hartnell, C.A., Ou, A.Y. and Kinicki, A., 2011. Organizational culture and organizational effectiveness: a meta-analytic investigation of the competing values framework's theoretical suppositions. *Journal of Applied Psychology*. 96(4), 677– 694.

Hoenig, T. and Morris, C., 2012. Restructuring the banking system to improve safety and soundness. *Working Paper.* FDIC and Federal Reserve Bank of Kansas City.

Jayaratne, J. and Strahan, P.E., 1996. The finance-growth Nexus: evidence from bank branch bderegulation. *Quarterly Journal of Economics*. 111(3), 639-670.

Jiang, L., Levine, R. and Lin, C., 2016. Competition and bank opacity. *Review of Financial Studies*. 29(7), 1911–1942.

Johnson, C. and Rice, T., 2008. Assessing a decade of interstate bank branching. *Washington and Lee Law Review*. 65, 73-127.

Jones, A.M., 2005. The anthropology of leadership: culture and corporate leadership in the American South. *Leadership*. 1(3), 259–278.

Kanagaretnam, K., Krishnan, G. and Lobo, G.J., 2009. Is the market valuation of banks' loan loss provision conditional on auditor reputation? *Journal of Banking and Finance.* 33(6), 1039-1047.

Kanagaretnam, K., Lobo, G.J. and Yang, D., 2004. Joint tests of signaling and income smoothing through bank loan loss provisions. *Contemporary Accounting Research.* 21(4), 843–884.

Keeton, W.R., 1999. Does faster loan growth lead to higher loan losses? *Economic Review.* Federal Reserve Bank of Kansas City. 84(Q II), 57-76.

Kim, M. and Kross, W., 1998. The impact of the 1989 change in bank capital standards on loan loss provisions and loan write-offs. *Journal of Accounting and Economics*. 25(1), 69-99.

Krishnan, K., Nandy, D.K. and Puri, M., 2015. Does financing spur small business productivity? Evidence from a Natural Experiment. *Review of Financial Studies*. 28(6). 1768–1809.

Leventis, S., Dimitropoulos, P.E. and Anandarajan, A., 2011. Loan loss provisions, earnings management and capital management under IFRS: The case of EU commercial banks. *Journal of Financial Services Research*. 40(1-2). 103–122

Levine, R., Lin, C. and Xie, W., 2021. Geographic diversification and banks' funding costs. *Management Science*. 67(5), 2657-3320.

Liu, C. and Ryan, S.G., 1995. The effect of bank loan portfolio composition on the market reaction to and anticipation of loan loss provisions. *Journal of Accounting Research*. 33(1), 77-94.

Liu, C., Ryan, S.G. and Wahlen, J.M., 1997. Differential valuation implications of loan loss provisions across banks and fiscal agents. *Accounting Review*. 77(1), 133-146.

Liu, C.C. and Ryan, S.G., 2006. Income smoothing over the business cycle: changes in banks' coordinated management of provisions for loan losses and loan charge-offs from the pre-1990 bust to the 1990s boom. *Accounting Review*. 81(2), 421-441.

Loughran, T. and McDonald, B., 2011. When is a liability not a liability? Textual analysis, dictionaries, and 10-Ks. *Journal of Finance*. 66(1), 35-65.

Martin, J., 1992. *Culture in Organizations: Three Perspectives*. New York: Oxford University Press.

Meyerson, D. and Martin, J., 1987. Cultural change: an integration of three different views. *Journal of Management Studies.* 24, 623–647.

Murphy, P.E., 1989. Creating ethical corporate structure. *Sloan Management Review*. 30(2), 81–87.

Nguyen, D.D., Hagendorff, J. and Eshraghi, A., 2016. Can bank boards prevent misconduct? *Review of Finance*. 20(1), 1-36.

Nguyen, D.D., Hagendorff, J. and Eshraghi, A., 2018. Does a CEO's cultural heritage affect performance under competitive pressure? *Review of Financial Studies*. 31(1), 97-141.

Nguyen, D.D., Nguyen, L. and Sila, V., 2019. Does corporate culture affect bank risk-taking? Evidence from Loan-Level Data. *British Journal of Management*. 30(1), 106–133.

O'Reilly, C.A. and Chatman, J.A., 1996. Culture as social control: Corporations, cults, and commitment. *Research in Organizational Behavior*. 18, 157-200.

Osma, B.G., Mora, A. and Porcuna-Enguix, L., 2019. Prudential supervisors' independence and income smoothing in European banks. *Journal of Banking and Finance*. 102, 156-176.

Rice, T. and Strahan, P.E., 2010. Does credit competition affect small-firm finance? *Journal of Finance*. 65(3), 861-889.

Schein, E.H., 1985. *Organizational Culture and Leadership: A Dynamic View*. San Francisco, CA: Jossey-Bass.

Song, F. and Thakor, A.V., 2019. Bank culture. *Journal of Financial Intermediation*. 39, 59-79.

Tomy, R.E., 2019. Threat of entry and the use of discretion in banks' financial reporting. *Journal of Accounting and Economics.* 67(1), 1-35.

Wahlen, J.M., 1994. The nature of information in commercial bank loan loss disclosures. *Accounting Review*. 69(3), 455-478.

Zarutskie, R. 2006. Evidence on the effects of bank competition on firm borrowing and investment. *Journal of Financial Economics,* 81, 503-537.

**Figure 1. The Competing Value Framework (CVF)**
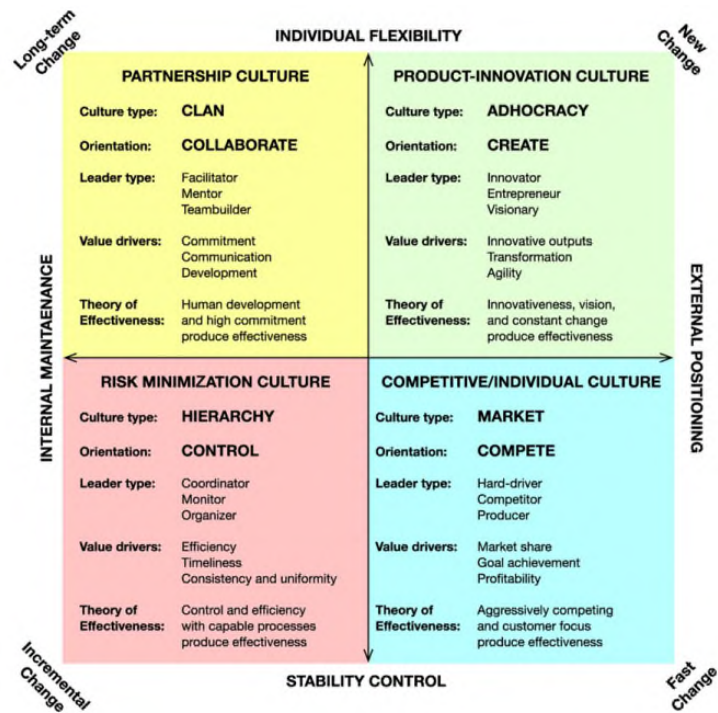


Note: This figure shows four types of organizational culture under the Competing Value Framework: Control, Collaborate, Create and Compete. Control and Collaborate belong to internal dimension while Compete and Create belong to external dimension. Source: Cameron et al. (2006).

**Figure 2. The CVF's four cultural types and organizational cultural layers**

| Culture | Assumptions | Beliefs | Values | Artefacts (behaviours) | Effectiveness Criteria |
|---|---|---|---|---|---|
| **Collaborate** (Clan) | Human affiliation | People behave appropriately when they have trust in, and are loyal to, the membership in the organization. | Attachment, affiliation, collaboration, trust and support | Teamwork, participation, employee involvement and open communication | Employee satisfaction and commitment |
| **Create** (Adhocracy) | Change | People behave appropriately when they understand the importance and the impact of the task. | Growth, stimulation, variety, autonomy and attention to detail | Gathering customer and competitor information, goal-setting, planning, task focus, competitiveness and aggressiveness | Increased market share, profit, product quality and productivity |
| **Competition** (Market) | Achievement | People behave appropriately when they have clear objectives and are rewarded based on their achievements. | Communication, competition, competence and achievement | Gathering customer and competitor information, goal-setting, planning, task focus, competitiveness and aggressiveness | Increased market share, profit, product quality and productivity |
| **Control** (Hierarchy) | Stability | People behave appropriately when they have clear roles and procedures are formally defined by rules and regulations. | Communication, routinisation, formalisation and consistency | Conformity and predictability | Efficiency, timeliness and smooth functioning |

Note: This figure presents the three layers of organizational culture (assumptions, values and beliefs, and artefacts) related to four types of cultures under the Competing Value Framework. Source: Hartnell et al. (2011, p.679).

**Figure 3. Bag of Words**

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

Note: This table presents the bag of key words used to measure bank culture. The final score for each cultural orientation (Control; Compete, Collaborate; Create) is computed as the number of times these keywords (or synonyms) appear scaled by the total number of words in bank annual reports. Source: Fiordelisi and Ricci (2021).

**Table 1: Summary statistics**

**Panel A. Variables used for the calculation of discretionary loan loss provisions**

| Variables | Definition | N | Mean | Std. | p25 | p50 | p75 |
|---|---|---|---|---|---|---|---|
| Discretionary LLP | The absolute value of the residual obtained from the equation modelling total loan loss provisions on its normal determinants shown in Equation (1) | 2594 | 2.1993 | 2.3310 | 0.7833 | 1.6657 | 2.7806 |
| LLP | The ratio of total loan loss provisions multiplied by 1000 to lagged total loans | 2594 | 3.9958 | 4.2349 | 1.8323 | 3.0762 | 4.8848 |
| ΔNPA | The change in total non-performing assets between year t and (t-1) to lagged total assets | 2594 | 0.0003 | 0.0225 | -0.0009 | 0.0000 | 0.0014 |
| ΔLoan | The change in total loans between year t and (t-1) to lagged total loans | 2594 | 0.1439 | 0.1605 | 0.0526 | 0.1113 | 0.1911 |
| ΔLCO | The change in total loan charge-offs between year t and (t-1) to lagged total assets | 2594 | 0.0002 | 0.0024 | -0.0003 | 0.0001 | 0.0007 |
| Size | The natural log of total assets | 2594 | 14.0888 | 1.5019 | 13.0566 | 13.6501 | 14.6988 |
| CS | A dummy variable indicating a competitive state that allows for the acquisition of a single branch and does not impose a deposit cap of 30% or lower | 2594 | 0.5455 | 0.4980 | 0.0000 | 1.0000 | 1.0000 |

**Table 1: Summary statistics (cont.)**

**Panel B. Main control variables**

| Variables | Definition | N | Mean | Std. | p25 | p50 | p75 |
|---|---|---|---|---|---|---|---|
| Control-dominant | A dummy variable indicating banks having a control dominant culture | 2594 | 0.2533 | 0.4350 | 0.0000 | 0.0000 | 1.0000 |
| Collaborate-dominant | A dummy variable indicating banks having a collaborate dominant culture | 2594 | 0.2521 | 0.4343 | 0.0000 | 0.0000 | 1.0000 |
| Compete-dominant | A dummy variable indicating banks having a complete dominant culture | 2594 | 0.2652 | 0.4415 | 0.0000 | 0.0000 | 1.0000 |
| Create-dominant | A dummy variable indicating banks having a create dominant culture | 2594 | 0.2490 | 0.4325 | 0.0000 | 0.0000 | 0.0000 |
| Size | The natural log of total assets | 2594 | 14.0888 | 1.5019 | 13.0566 | 13.6501 | 14.6988 |
| Age | The natural log of years in operation | 2589 | 2.7119 | 0.6123 | 2.4849 | 2.8332 | 3.0445 |
| NPA | The ratio of nonperforming assets to total assets | 2594 | 0.0047 | 0.0045 | 0.0018 | 0.0035 | 0.0060 |
| ROA | Return on average assets which is net income divided by average total assets | 2593 | 0.0119 | 0.0040 | 0.0097 | 0.0119 | 0.0143 |
| ΔLoan | The change in total loans between year t and (t-1) to lagged total loans | 2594 | 0.1439 | 0.1605 | 0.0526 | 0.1113 | 0.1911 |
| ΔDeposit | The change in total deposits between year t and (t-1) to lagged total deposits | 2594 | 0.1276 | 0.1580 | 0.0348 | 0.0864 | 0.1665 |
| EBTP | The ratio of earnings before tax and provisions multiplied by 1000 to total assets | 2594 | 16.3287 | 5.8303 | 12.9522 | 16.1543 | 19.6926 |
| Capital | The ratio of total equity capital to total assets | 2594 | 0.0904 | 0.0208 | 0.0759 | 0.0888 | 0.1012 |
| GDP growth | The State's GDP growth between year t and (t-1) | 2594 | 0.0541 | 0.0237 | 0.0398 | 0.0515 | 0.0687 |
| Population growth | The State's population growth between year t and (t-1) | 2594 | 0.0076 | 0.0059 | 0.0030 | 0.0070 | 0.0110 |

Note: This table provides the summary statistics of the variables used to estimate DLLPs (Panel A) as well as the summary statistics of all main control variables used in the study (Panel B). Data was retrieved from three sources. We apply textual analysis based on Competing Value Framework to the annual reports (forms 10-K) of individual banks to capture organizational culture. Financial information was retrieved from Call reports (forms FR Y-9C) filed by banks at the consolidated level. Macroeconomic variables were retrieved from the Bureau of Economic Analysis. The number of observations (N), means (Mean), standard deviations (Std.), 25th percentiles (p25), medians (p50) and 75th percentiles (p75) are reported.

**Table 2: Statistics by bank dominant culture**

**Panel A: Sample means by dominant culture**

|  | Control | Collaborate | Compete | Create | Unclassified |
|---|---|---|---|---|---|
| Discretionary LLP | 2.061 | 2.197 | 2.169 | 2.385 | 2.175 |
| CS | 0.588 | 0.589 | 0.523 | 0.584 | 0.502 |
| Size | 13.761 | 14.484 | 14.488 | 14.305 | 13.922 |
| Age | 2.679 | 2.817 | 2.814 | 2.748 | 2.669 |
| NPA | 0.005 | 0.005 | 0.004 | 0.005 | 0.005 |
| ROA | 0.052 | 0.038 | 0.034 | 0.044 | 0.045 |
| $\Delta$Loan | 0.127 | 0.136 | 0.152 | 0.134 | 0.151 |
| $\Delta$Deposit | 0.107 | 0.124 | 0.143 | 0.124 | 0.132 |
| Capital | 0.092 | 0.090 | 0.090 | 0.091 | 0.090 |
| EBTP | 16.472 | 16.383 | 16.396 | 16.742 | 16.066 |
|  | 657 | 654 | 688 | 646 | 817 |

**Panel B: Culture values overtime**

| Year | Control | Collaborate | Compete | Create |
|---|---|---|---|---|
| 1994 | 0.254 | 0.254 | 0.254 | 0.254 |
| 1995 | 0.248 | 0.248 | 0.255 | 0.248 |
| 1996 | 0.250 | 0.250 | 0.255 | 0.255 |
| 1997 | 0.255 | 0.251 | 0.243 | 0.251 |
| 1998 | 0.252 | 0.248 | 0.241 | 0.252 |
| 1999 | 0.244 | 0.251 | 0.244 | 0.251 |
| 2000 | 0.249 | 0.256 | 0.249 | 0.252 |
| 2001 | 0.248 | 0.248 | 0.248 | 0.255 |
| 2002 | 0.251 | 0.248 | 0.251 | 0.254 |
| 2003 | 0.250 | 0.253 | 0.253 | 0.253 |
| 2004 | 0.254 | 0.254 | 0.254 | 0.254 |
| 2005 | 0.252 | 0.252 | 0.252 | 0.252 |

**Panel C: Examples of banks in each dominant culture category**

| Control | Collaborate | Compete | Create |
|---|---|---|---|
| Bank of American Corporation | F.N.B. Corporation | State Street Corporation | JPMorgan Chase & Co. |
| Regions Financial Corporation | International Bancshares Corporation | Colonial BancGroup, Inc. | Community Bank System, Inc. |
| Fifth Third Bancorp | First Horizon National Corporation | Commerce Bancshares, Inc. | Commerce Bancorp, Inc. |

Note: This table presents additional statistics. Panel A shows the sample mean of the main variables for different subsets based on bank dominant culture. Panel B presents the average raw cultural scores for each type of culture across all banks in the same year for each year in the sample period (1994-2006). A raw score is computed as the number of times the keywords (or synonyms) appear scaled by the total number of words in bank annual reports. Panel C provides examples of banks in each dominant culture category. Full variable definitions are presented in Table 1.

**Table 3. Culture and Discretionary LLPs: Internal- vs. External-dominant culture**

| | Internal-dominant (1) | External-dominant (2) | Both dimensions (3) |
|---|---|---|---|
| Internal-dominant | 0.226 | | 0.238 |
| | (0.188) | | (0.159) |
| Internal-dominant*CS | -0.391* | | -0.405** |
| | (0.213) | | (0.187) |
| External-dominant | | -0.445** | -0.452*** |
| | | (0.199) | (0.149) |
| External-dominant*CS | | 0.631*** | 0.639*** |
| | | (0.226) | (0.179) |
| CS | 0.418 | -0.021 | 0.148 |
| | (0.267) | (0.248) | (0.239) |
| Size | -0.113 | -0.167 | -0.146 |
| | (0.366) | (0.364) | (0.243) |
| Age | -0.582 | -0.571 | -0.610* |
| | (0.470) | (0.470) | (0.333) |
| NPA | 83.385*** | 86.303*** | 86.392*** |
| | (24.010) | (24.125) | (20.320) |
| ROA | -0.929 | -1.867 | -1.814 |
| | (7.039) | (6.981) | (5.828) |
| ΔLoan | -1.456** | -1.483** | -1.469*** |
| | (0.606) | (0.598) | (0.562) |
| ΔDeposit | 1.500*** | 1.507*** | 1.505*** |
| | (0.572) | (0.559) | (0.523) |
| Capital | 3.007 | 4.133 | 4.051 |
| | (5.263) | (5.172) | (4.399) |
| GDP Growth | 0.536 | 0.349 | 0.198 |
| | (3.389) | (3.368) | (2.949) |
| Population Growth | 0.556** | 0.527** | 0.543*** |
| | (0.266) | (0.267) | (0.209) |
| Constant | 3.955 | 4.929 | 4.639 |
| | (5.278) | (5.228) | (3.518) |
| Bank FE | YES | YES | YES |
| Year FE | YES | YES | YES |
| R-squared | 0.476 | 0.478 | 0.479 |
| Observations | 2,559 | 2,559 | 2,559 |

Note: This table reports the results on the impact of bank culture on discretionary loan loss provisioning (DLLP) from Equation (2). The dependent variable (DLLP) is the absolute value of the residual obtained from the regression specified in Equation (1). Internal-dominant and External-dominant are dummy variables indicating banks having an internally and externally focused culture, respectively. Cultures are estimated based on Competing Value Framework using textual analysis of bank annual reports. CS is a dummy variable indicating banking market competition level in a U.S. state, which takes the value of 1 if a state allows for the acquisition of a single branch and does not impose a deposit cap of 30% or lower, and 0 otherwise. Full variable definitions are provided in Table 1. Standard errors clustered at State level are in parentheses. ***, ** and * denote statistically significant at the 1%, 5% and 10% levels, respectively.

**Table 4. Culture and Discretionary LLPs: Specific dominant culture**

| | Control dominant (1) | Collaborate dominant (2) | Compete dominant (3) | Create dominant (4) | All culture types (5) |
|---|---|---|---|---|---|
| Control-dominant | 0.161 | | | | 0.201 |
| | (0.218) | | | | (0.221) |
| Control-dominant*CS | -0.342 | | | | -0.398 |
| | (0.255) | | | | (0.258) |
| Collaborate-dominant | | 0.308* | | | 0.294* |
| | | (0.184) | | | (0.176) |
| Collaborate-dominant*CS | | -0.359* | | | -0.351* |
| | | (0.201) | | | (0.198) |
| Compete-dominant | | | -0.369* | | -0.398* |
| | | | (0.215) | | (0.224) |
| Compete-dominant*CS | | | 0.563** | | 0.621** |
| | | | (0.253) | | (0.258) |
| Create-dominant | | | | -0.486** | -0.448** |
| | | | | (0.201) | (0.203) |
| Create-dominant*CS | | | | 0.636** | 0.601** |
| | | | | (0.251) | (0.257) |
| CS | 0.311 | 0.379 | 0.091 | 0.120 | 0.141 |
| | (0.245) | (0.261) | (0.245) | (0.241) | (0.272) |
| Size | -0.114 | -0.138 | -0.146 | -0.162 | -0.156 |
| | (0.365) | (0.370) | (0.368) | (0.369) | (0.362) |
| Age | -0.561 | -0.561 | -0.540 | -0.604 | -0.629 |
| | (0.469) | (0.474) | (0.475) | (0.469) | (0.464) |
| NPA | 83.565*** | 83.725*** | 84.557*** | 85.483*** | 87.239*** |
| | (24.044) | (23.874) | (24.151) | (23.854) | (24.098) |
| ROA | -1.109 | -0.873 | -1.363 | -1.767 | -2.132 |
| | (6.990) | (7.041) | (7.015) | (6.939) | (6.981) |
| ΔLoan | -1.477** | -1.457** | -1.475** | -1.497** | -1.494** |
| | (0.601) | (0.609) | (0.602) | (0.600) | (0.600) |
| ΔDeposit | 1.509*** | 1.515*** | 1.503*** | 1.538*** | 1.558*** |
| | (0.566) | (0.570) | (0.564) | (0.557) | (0.559) |
| Capital | 3.199 | 3.150 | 3.655 | 3.688 | 4.386 |
| | (5.272) | (5.341) | (5.241) | (5.240) | (5.180) |
| GDP Growth | 0.604 | 0.521 | 0.444 | 0.617 | 0.146 |
| | (3.389) | (3.407) | (3.393) | (3.381) | (3.384) |
| Population Growth | 0.558** | 0.544** | 0.539** | 0.521* | 0.540** |
| | (0.267) | (0.266) | (0.268) | (0.269) | (0.267) |
| Constant | 3.977 | 4.239 | 4.488 | 4.889 | 4.807 |
| | (5.281) | (5.312) | (5.291) | (5.308) | (5.210) |
| Bank FE | YES | YES | YES | YES | YES |
| Year FE | YES | YES | YES | YES | YES |
| R-squared | 0.475 | 0.476 | 0.476 | 0.477 | 0.480 |
| Observations | 2,559 | 2,559 | 2,559 | 2,559 | 2,559 |

Note: This table reports the results on the impact of bank culture on discretionary loan loss provisioning (DLLP) from Equation (2). The dependent variable (DLLP) is the absolute value of the residual obtained from the regression specified in Equation (1). Control-dominant, Collaborate-dominant, Compete-dominant and Create-dominant are dummy variables indicating banks having a control-, collaborate-, compete- and create-dominant cultures, respectively. Cultures are estimated based on Competing Value Framework using textual analysis of bank annual reports. CS is a dummy variable indicating banking market competition level in a U.S. state, which takes the value of 1 if a state allows for the acquisition of a single branch and does not impose a deposit cap of 30% or lower, and 0 otherwise. Full variable definitions are provided in Table 1. Standard errors clustered at State level are in parentheses. ***, ** and * denote statistically significant at the 1%, 5% and 10% levels, respectively.

Table 5. Falsification tests

| | Placebo deregulation date (1) | Placebo competitive state (2) |
|---|---|---|
| Control-dominant | 0.097 | -0.146 |
| | (0.150) | (0.142) |
| Control-dominant*CS | -0.277 | 0.241 |
| | (0.183) | (0.219) |
| Collaborate-dominant | 0.231* | 0.136 |
| | (0.133) | (0.134) |
| Collaborate-dominant*CS | -0.286 | -0.092 |
| | (0.181) | (0.217) |
| Compete-dominant | -0.204 | -0.040 |
| | (0.181) | (0.144) |
| Compete-dominant*CS | 0.298 | -0.060 |
| | (0.195) | (0.188) |
| Create-dominant | -0.148 | -0.124 |
| | (0.165) | (0.157) |
| Create-dominant*CS | 0.084 | 0.035 |
| | (0.164) | (0.174) |
| CS | 0.047 | -0.006 |
| | (0.115) | (0.120) |
| Size | -0.146 | -0.130 |
| | (0.370) | (0.371) |
| Age | -0.548 | -0.555 |
| | (0.468) | (0.470) |
| NPA | 85.416*** | 84.557*** |
| | (24.106) | (24.115) |
| ROA | -0.507 | -0.755 |
| | (6.900) | (6.934) |
| ΔLoan | -1.531** | -1.465** |
| | (0.604) | (0.599) |
| ΔDeposit | 1.558*** | 1.503*** |
| | (0.569) | (0.559) |
| Capital | 3.097 | 3.066 |
| | (5.288) | (5.337) |
| GDP Growth | 0.668 | 0.582 |
| | (3.384) | (3.391) |
| Population Growth | 0.566** | 0.554** |
| | (0.268) | (0.271) |
| Constant | 4.516 | 4.365 |
| | (5.337) | (5.349) |
| Bank FE | YES | YES |
| Year FE | YES | YES |
| R-squared | 0.477 | 0.476 |
| Observations | 2,559 | 2,559 |

Note: This table presents the results for our placebo tests for parallel trend assumption in the difference-in-differences estimator. In Column (1), we randomly assign individual states into each of the deregulation years and keep their corresponding competitive values unchanged. In Column (2), we randomly assign states to the competitive values (ranging from zero to one) and keep their regulation years unchanged. The dependent variable (DLLP) is the absolute value of the residual obtained from the regression specified in Equation (1). Control-dominant, Collaborate-dominant, Compete-dominant and Create-dominant are dummy variables indicating banks having a control-, collaborate-, compete- and create-dominant cultures, respectively. Cultures are estimated based on Competing Value Framework using textual analysis of bank annual reports. CS is a dummy variable indicating banking market competition level in a U.S. state, which takes the value of 1 if a state allows for the acquisition of a single branch and does not impose a deposit cap of 30% or lower, and 0 otherwise. Full variable definitions are provided in Table 1. Standard errors clustered at State level are in parentheses. ***, ** and * denote statistically significant at the 1%, 5% and 10% levels, respectively.

**Table 6. Additional robustness tests**

| | Trend FEs (1) | Crisis (2) | Economic variables (3) | Alternative DLLP (4) | Texas and Iowa (5) | Reverse causality (6) | Alternative competition (7) | Augmented keywords (8) |
|---|---|---|---|---|---|---|---|---|
| Control-dominant | 0.168 | 0.353 | 0.196 | 0.224 | 0.138 | 0.196 | 0.225 | 0.208 |
| | (0.228) | (0.291) | (0.221) | (0.217) | (0.249) | (0.221) | (0.222) | (0.219) |
| Control-dominant*CS | -0.353 | -0.636* | -0.386 | -0.383 | -0.342 | -0.394 | -0.103 | -0.388 |
| | (0.261) | (0.329) | (0.257) | (0.253) | (0.283) | (0.258) | (0.066) | (0.255) |
| Collaborate-dominant | 0.270 | 0.582*** | 0.302* | 0.309* | 0.286 | 0.290 | 0.356* | 0.294* |
| | (0.180) | (0.191) | (0.176) | (0.169) | (0.195) | (0.176) | (0.195) | (0.176) |
| Collaborate-dominant*CS | -0.370* | -0.798*** | -0.358* | -0.369* | -0.338 | -0.348* | -0.113* | -0.352* |
| | (0.213) | (0.226) | (0.198) | (0.189) | (0.212) | (0.199) | (0.063) | (0.198) |
| Compete-dominant | -0.393** | -0.694** | -0.401* | -0.430* | -0.376 | -0.397* | -0.415** | -0.398* |
| | (0.192) | (0.271) | (0.224) | (0.225) | (0.240) | (0.224) | (0.201) | (0.223) |
| Compete-dominant*CS | 0.630** | 1.024*** | 0.616** | 0.699*** | 0.602** | 0.624** | 0.157** | 0.620** |
| | (0.245) | (0.319) | (0.257) | (0.259) | (0.272) | (0.259) | (0.063) | (0.258) |
| Create-dominant | -0.468** | -0.584** | -0.460** | -0.456** | -0.516** | -0.441** | -0.472** | -0.448** |
| | (0.202) | (0.253) | (0.201) | (0.206) | (0.219) | (0.203) | (0.192) | (0.203) |
| Create-dominant*CS | 0.607** | 0.724** | 0.618** | 0.625** | 0.671** | 0.588** | 0.153** | 0.599** |
| | (0.260) | (0.299) | (0.255) | (0.258) | (0.270) | (0.258) | (0.071) | (0.257) |
| CS | -0.111 | 0.175 | 0.065 | -0.053 | 0.131 | 0.031 | 0.026 | 0.143 |
| | (0.219) | (0.290) | (0.260) | (0.251) | (0.280) | (0.274) | (0.072) | (0.272) |
| Pre1 | | | | | | -0.115 | | |
| | | | | | | (0.418) | | |
| Pre2 | | | | | | -0.188 | | |
| | | | | | | (0.322) | | |
| Constant | 1.326 | 1.113 | 43.648 | 6.028 | 5.321 | 4.952 | 4.986 | 6.082 |
| | (4.771) | (5.776) | (42.477) | (5.744) | (5.374) | (5.218) | (3.559) | (5.462) |
| Controls | YES | YES | YES | YES | YES | YES | YES | YES |
| State-Year Trend FEs | YES | NO | NO | NO | NO | NO | NO | NO |
| Bank FE | YES | YES | YES | YES | YES | YES | YES | YES |
| Year FE | NO | YES | YES | YES | YES | YES | YES | YES |
| R-squared | 0.495 | 0.509 | 0.481 | 0.470 | 0.485 | 0.481 | 0.478 | 0.480 |
| Observations | 2,559 | 1,729 | 2,559 | 2,559 | 2,426 | 2,559 | 2,559 | 2,559 |

Note: This table presents the results of the robustness tests of our baseline specification. In Column 1, we control for both state-year trend fixed effects and bank fixed effects. In Column 2, we exclude the crisis period (2000-2002). Column 3 incorporates three additional macroeconomic variables to account for the possible omitted variables. Column 4 reports the estimation result using an alternative measure of discretionary LLPs. In Column 5, we exclude banks incorporated in Texas and Iowa. Column 6 is a check for reverse causality. In Column 7, we use Rice and Strahan (2010) index as an alternative measure of bank competition. In Column 8, we use the augmented bag of worlds including keywords reflecting bank characteristics. Controls are included but not reported for brevity. Full variable definitions are provided in Table 1. Standard errors clustered at the State level (except Column 1) are in parentheses. ***, ** and * denote statistically significant at the 1%, 5% and 10% levels, respectively.

### Table 7. Culture and motivation to use discretionary LLPs

| | Income Smoothing (1) | Signalling Behaviour (2) |
|---|---|---|
| Control-dominant | 0.176 | 0.326 |
| | (0.223) | (0.238) |
| Control-dominant*CS | -1.327** | -0.672** |
| | (0.554) | (0.273) |
| Collaborate-dominant | 0.288 | 0.135 |
| | (0.235) | (0.280) |
| Collaborate-dominant*CS | 0.953 | -0.136 |
| | (0.650) | (0.398) |
| Compete-dominant | -0.391 | -0.309 |
| | (0.262) | (0.224) |
| Compete-dominant*CS | 0.169 | 0.579 |
| | (0.493) | (0.316) |
| Create-dominant | -0.378 | -0.102 |
| | (0.216) | (0.255) |
| Create-dominant*CS | 0.260 | 0.408 |
| | (0.508) | (0.268) |
| Control-dominant*CS*EBTP | 0.055 | |
| | (0.032) | |
| Collaborate-dominant*CS*EBTP | -0.084** | |
| | (0.037) | |
| Create-dominant*CS*EBTP | 0.029 | |
| | (0.026) | |
| Compete-dominant*CS*EBTP | 0.021 | |
| | (0.032) | |
| Control-dominant*CS*$\Delta$EBTP$_{t+1}$ | | 0.490 |
| | | (0.272) |
| Collaborate-dominant*CS*$\Delta$EBTP$_{t+1}$ | | -0.391 |
| | | (0.263) |
| Compete-dominant*CS*$\Delta$EBTP$_{t+1}$ | | -0.056 |
| | | (0.046) |
| Create-dominant*CS*$\Delta$EBTP$_{t+1}$ | | 0.731** |
| | | (0.257) |
| CS | 0.094 | 0.238 |
| | (0.336) | (0.285) |
| EBTP | -0.116*** | |
| | (0.020) | |
| $\Delta$EBTP$_{t+1}$ | | 0.035 |
| | | (0.035) |
| Constant | 1.642 | -1.046 |
| | (4.405) | (1.281) |
| Controls | YES | YES |
| Bank FE | YES | YES |
| Year FE | YES | YES |
| R-squared | 0.522 | 0.152 |
| Observations | 2,559 | 2,559 |

Note: This table reports the impact of corporate culture on bank motives to use discretionary LLPs. Column (1) shows the result of Model (3) which tests income smoothing behaviour, while Column (2) tests for signalling behaviour. The dependent variable (Discretionary LLP) is the absolute value of the residual obtained from Equation (1). Control variables are included but not reported for brevity. Full variable definitions are provided in Table 1. Standard errors clustered at State level are in parentheses. ***, ** and * denote statistically significant at the 1%, 5% and 10% levels, respectively.

**Table 8. Culture and enforcement actions**

| | Control dominant (1) | Collaborate dominant (2) | Compete dominant (3) | Create dominant (4) | All culture types (5) |
|---|---|---|---|---|---|
| Control-dominant | 0.001 | | | | 0.002 |
| | (0.027) | | | | (0.027) |
| Control-dominant*CS | 0.005 | | | | 0.004 |
| | (0.031) | | | | (0.031) |
| Collaborate-dominant | | 0.002 | | | -0.005 |
| | | (0.024) | | | (0.024) |
| Collaborate-dominant*CS | | -0.007 | | | 0.003 |
| | | (0.028) | | | (0.029) |
| Compete-dominant | | | 0.009 | | 0.012 |
| | | | (0.029) | | (0.029) |
| Compete-dominant*CS | | | -0.021 | | -0.022 |
| | | | (0.034) | | (0.034) |
| Create-dominant | | | | -0.060** | -0.061** |
| | | | | (0.025) | (0.025) |
| Create-dominant*CS | | | | 0.066** | 0.066** |
| | | | | (0.031) | (0.030) |
| CS | 0.030 | 0.033 | 0.037 | 0.019 | 0.023 |
| | (0.029) | (0.031) | (0.030) | (0.031) | (0.034) |
| Size | 0.053 | 0.053 | 0.054 | 0.049 | 0.050 |
| | (0.039) | (0.039) | (0.039) | (0.039) | (0.039) |
| Age | -0.101*** | -0.101*** | -0.101*** | -0.107*** | -0.108*** |
| | (0.037) | (0.037) | (0.037) | (0.036) | (0.037) |
| NPA | 2.703* | 2.736* | 2.686* | 2.934* | 2.848* |
| | (1.579) | (1.582) | (1.581) | (1.587) | (1.598) |
| ROA | 0.567 | 0.564 | 0.573 | 0.474 | 0.489 |
| | (0.661) | (0.661) | (0.661) | (0.659) | (0.663) |
| ΔLoan | 0.001 | 0.001 | 0.001 | -0.002 | -0.001 |
| | (0.062) | (0.062) | (0.062) | (0.062) | (0.062) |
| ΔDeposit | 0.014 | 0.013 | 0.012 | 0.017 | 0.016 |
| | (0.063) | (0.063) | (0.063) | (0.063) | (0.063) |
| Capital | -0.277 | -0.277 | -0.282 | -0.242 | -0.256 |
| | (0.487) | (0.490) | (0.487) | (0.484) | (0.486) |
| GDP Growth | 0.746** | 0.744** | 0.747** | 0.734** | 0.741** |
| | (0.366) | (0.368) | (0.367) | (0.363) | (0.364) |
| Population Growth | 0.007 | 0.008 | 0.008 | 0.006 | 0.006 |
| | (0.029) | (0.029) | (0.029) | (0.029) | (0.029) |
| Constant | -0.441 | -0.443 | -0.457 | -0.352 | -0.365 |
| | (0.589) | (0.587) | (0.587) | (0.584) | (0.587) |
| Bank FE | YES | YES | YES | YES | YES |
| Year FE | YES | YES | YES | YES | YES |
| R-squared | 0.355 | 0.355 | 0.355 | 0.357 | 0.357 |
| Observations | 3,003 | 3,003 | 3,003 | 3,003 | 3,003 |

Note: This table reports the results on the impact of bank culture on the likelihood of a severe enforcement action being received. The dependent variable (Sanction) is a dummy variable that takes the value of 1 if a given bank receives a formal enforcement action in any given year, and 0 otherwise. Control-dominant, Collaborate-dominant, Compete-dominant and Create-dominant are dummy variables indicating banks having a control-, collaborate-, compete- and create-dominant cultures, respectively. Cultures are estimated based on Competing Value Framework using textual analysis of bank annual reports. CS is a dummy variable indicating banking market competition level in a U.S. state, which takes the value of 1 if a state allows for the acquisition of a single branch and does not impose a deposit cap of 30% or lower, and 0 otherwise. Full variable definitions are provided in Table 1. Standard errors clustered at State level are in parentheses. ***, ** and * denote statistically significant at the 1%, 5% and 10% levels, respectively.

# Appendix

## Appendix 1

### Table A1. Examples of bank cultures in the sample period 1994-2006

| Year | CVB Financial Corporation (1) | Huntington Bancshares Incorporated (2) | JP Morgan (3) | U.S. Bancorp (4) |
|------|------|------|------|------|
| 1994 | 0 | 4 | 4 | 1 |
| 1995 | 0 | 0 | 4 | 1 |
| 1996 | 1 | 1 | 4 | 3 |
| 1997 | 1 | 0 | 4 | 2 |
| 1998 | 0 | 2 | 4 | 3 |
| 1999 | 1 | 1 | 4 | 3 |
| 2000 | 3 | 1 | 3 | 0 |
| 2001 | 3 | 4 | 4 | 3 |
| 2002 | 3 | 4 | 4 | 2 |
| 2003 | 0 | 0 | 4 | 2 |
| 2004 | 0 | 4 | 4 | 4 |
| 2005 | 0 | 0 | 4 | 4 |
| 2006 | 2 | 0 | 3 | 0 |

Note: This tables reports the dominant culture of individual banks over time. Dominant culture is identified by comparing the culture value of each bank relative to its peers in the same cultural orientation in a given year. If a bank culture value lies in the top quartile of all bank in the same year, the relevant culture is dominant. Control-dominant is coded 1; Collaborate-dominant 2; Compete-dominant 3; Create-dominant 4 and No dominant culture 0. Cultures are estimated based on Competing Value Framework using textual analysis of bank annual reports from 1994-2006.

**Table A2. Interstate Branching Deregulation 1994-2006**

| State | Effective Year (1) | Minimum Age (2) | Allow De novo Interstate Branching (3) | Allow Acquisition of Single Branch (4) | Deposit Cap (5) | Rice and Strahan (2010) Index (6) | Nguyen et al. (2018) Index (7) |
|---|---|---|---|---|---|---|---|
| Alabama | 1997 | 5 years | No | No | 30% | 1 | 0 |
| Alaska | 1994 | 4 years | No | Yes | 50% | 2 | 1 |
| Arizona | 2001 | 5 years | No | Yes | 30% | 2 | 1 |
| Arizona | 1996 | 5 years | No | No | 30% | 1 | 0 |
| Arkansas | 1997 | 5 years | No | No | 25% | 0 | 0 |
| California | 1995 | 5 years | No | No | 30% | 1 | 0 |
| Colorado | 1997 | 5 years | No | No | 25% | 0 | 0 |
| Connecticut | 1995 | 5 years | Yes | Yes | 30% | 3 | 1 |
| Delaware | 1995 | 5 years | No | No | 30% | 1 | 0 |
| DC | 1996 | No | Yes | Yes | 30% | 4 | 1 |
| Florida | 1997 | 3 years | No | No | 30% | 1 | 0 |
| Georgia | 2002 | 3 years | No | No | 30% | 1 | 0 |
| Georgia | 1997 | 5 years | No | No | 30% | 1 | 0 |
| Hawaii | 2001 | No | Yes | Yes | 30% | 4 | 1 |
| Hawaii | 1997 | 5 years | No | No | 30% | 1 | 0 |
| Idaho | 1995 | 5 years | No | No | None | 1 | 0 |
| Illinois | 2004 | 5 years | No | No | 30% | 1 | 0 |
| Indiana | 1998 | 5 years | Yes | Yes | 30% | 3 | 1 |
| Indiana | 1997 | No | Yes | Yes | 30% | 4 | 1 |
| Iowa | 1996 | 5 years | No | No | 15% | 0 | 0 |
| Kansas | 1995 | 5 years | No | No | 15% | 0 | 0 |
| Kentucky | 2004 | No | No | No | 15% | 1 | 0 |
| Kentucky | 2000 | No | No | No | 15% | 1 | 0 |
| Kentucky | 1997 | 5 years | No | No | 15% | 0 | 0 |
| Louisiana | 1997 | 5 years | No | No | 30% | 1 | 0 |
| Maine | 1997 | No | Yes | Yes | 30% | 4 | 1 |
| Maryland | 1995 | No | Yes | Yes | 30% | 4 | 1 |
| Massachusetts | 1996 | 3 years | Yes | Yes | 30% | 3 | 1 |
| Michigan | 1995 | No | Yes | Yes | None | 4 | 1 |
| Minnesota | 1997 | 5 years | No | No | 30% | 1 | 0 |
| Mississippi | 1997 | 5 years | No | No | 25% | 0 | 0 |
| Missouri | 1995 | 5 years | No | No | 13% | 0 | 0 |
| Montana | 2001 | 5 years | No | No | 22% | 0 | 0 |
| Nebraska | 1997 | 5 years | No | No | 14% | 0 | 0 |
| Nevada | 1995 | 5 years | Limited | Limited | 30% | 1 | 0 |
| New Hampshire | 2002 | No | Yes | Yes | 30% | 4 | 1 |
| New Hampshire | 2000 | 5 years | Yes | Yes | 30% | 3 | 1 |
| New Hampshire | 1997 | 5 years | No | No | 20% | 0 | 0 |
| New Jersey | 1996 | No | No | Yes | 30% | 3 | 1 |
| New Mexico | 1996 | 5 years | No | No | 40% | 1 | 0 |
| New York | 1997 | 5 years | No | Yes | 30% | 2 | 1 |
| North Carolina | 1995 | No | Yes | Yes | 30% | 4 | 1 |
| North Dakota | 2003 | No | Yes | Yes | 25% | 3 | 0 |
| North Dakota | 1997 | No | No | No | 25% | 1 | 0 |

**Table A2. Interstate Branching Deregulation 1994-2006 (cont.)**

| State | Effective Year | Minimum Age | Allow De novo Interstate Branching | Allow Acquisition of Single Branch | Deposit Cap | Rice and Strahan (2010) Index | Nguyen et al. (2018) Index |
|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Ohio | 1997 | No | Yes | Yes | 30% | 4 | 1 |
| Oklahoma | 2000 | No | Yes | Yes | 20% | 3 | 0 |
| Oklahoma | 1997 | 5 years | No | No | 15% | 0 | 0 |
| Oregon | 1997 | 3 years | No | No | 30% | 1 | 0 |
| Rhode Island | 1995 | No | Yes | Yes | 30% | 4 | 1 |
| South Carolina | 1996 | 5 years | No | No | 30% | 1 | 0 |
| South Dakota | 1996 | 5 years | No | No | 30% | 1 | 0 |
| Tennessee | 2003 | 3 years | Yes | Yes | 30% | 3 | 1 |
| Tennessee | 2001 | 5 years | Yes | Yes | 30% | 3 | 1 |
| Tennessee | 1998 | 5 years | No | Yes | 30% | 2 | 1 |
| Tennessee | 1997 | 5 years | No | No | 20% | 1 | 0 |
| Texas | 1999 | No | Yes | Yes | 20% | 2 | 0 |
| Utah | 2001 | 5 years | Yes | Yes | 30% | 3 | 1 |
| Utah | 1995 | 5 years | No | Yes | 30% | 2 | 1 |
| Vermont | 2001 | No | Yes | Yes | 30% | 4 | 1 |
| Vermont | 1996 | 5 years | No | Yes | 30% | 2 | 1 |
| Virginia | 1995 | No | Yes | Yes | 30% | 4 | 1 |
| Washington | 1996 | 5 years | No | No | 30% | 1 | 0 |
| West Virginia | 1997 | No | Yes | Yes | 25% | 3 | 0 |
| Wisconsin | 1996 | 5 years | No | No | 30% | 1 | 0 |
| Wyoming | 1997 | 3 years | No | No | 30% | 1 | 0 |

Note: This tables lists the index of banking competition, constructed based on the Interstate Banking and Branching Efficiency Act 1994 (IBBEA). The IBBEA grants U.S. states substantial discretion to block some or all out-of-state entries by imposing one or all of the following restrictions: (1) impose a minimum age of three years on target institutions of interstate acquirers; (2) prohibit de novo interstate branching; (3) prohibit the acquisition of individual branches by an out-of-state bank; and (4) impose a deposit cap of 30% or lower. The inversed Rice and Strahan (2010) index (Column 6) is set to four for states that have removed all the four aforementioned restrictions, and zero for states that have imposed all the restrictions. Nguyen et al. (2018) (Column 7) sets competition equal one for states that have removed restrictions on acquisition of single branch and requirement on deposit cap, and zero otherwise. Source: Nguyen et al. (2018); Rice and Strahan (2010).

**Table A3. Deregulation and bank lending risk**

| Dependent variables | LLP/Loan | NPL/Loan |
|---|---|---|
| | (1) | (2) |
| IBBEA*Post | 0.506 | 0.100 |
| | (0.394) | (0.127) |
| Size | 0.198 | 0.094 |
| | (0.472) | (0.059) |
| Age | 0.259 | -0.009 |
| | (0.521) | (0.073) |
| ΔLoan | -1.004 | -0.505*** |
| | (0.918) | (0.136) |
| ΔDeposit | 1.260 | 0.178 |
| | (0.887) | (0.108) |
| Capital | -6.620 | -1.620** |
| | (4.221) | (0.793) |
| GDP Growth | 0.335 | -0.097 |
| | (0.432) | (0.064) |
| Population Growth | 0.123 | -0.512 |
| | (6.377) | (0.792) |
| Constant | YES | YES |
| | YES | YES |
| Bank FE | 0.455 | 0.558 |
| Year FE | 2,934 | 2,933 |
| R-squared | 0.506 | 0.100 |
| Observations | (0.394) | (0.127) |

Note: This table reports the results on the impact of the Interstate Banking and Branching Efficiency Act 1994 (IBBEA) on bank loan loss provisions (LLP) and non-performing loan (NPL). In Column (1), the dependent variable is LLP to total loans. In Column (2), the dependent variable is NPL to total loans. 'IBBEA*Post' takes the value of one for the years after a State deregulates the banking market and zero otherwise.

## Recent CRBF Working papers published in this Series

### Third Quarter | 2021

21-009 **Alessio Reghezza, Yener Altunbas, David Marques-Ibanez, Costanza Rodriguez d'Acri, Martina Spaggiari:** Do Banks Fuel Climate Change?.

### Second Quarter | 2021

21-008 **Dolores Gutiérrez-Mora and Daniel Oto-Peralías:** Gendered Cities: Studying Urban Gender Bias through Street Names.

21-007 **Linh H. Nguyen, John O.S. Wilson, Tuan Q. Le, Hiep N. Luu, Vinh X. Vo, Tram-Anh Nguyen:** Deposit Insurance and Credit Union Lending.

21-006 **Michael Koetter, Thomas Krause, Eleonora Sfrappini, Lena Tonzer:** Completing the European Banking Union: Capital Cost Consequences for Credit Providers and Corporate Borrowers.

21-005 **Marcel Lukas and Ray Charles "Chuck" Howard:** The Influence of Budgets on Consumer Spending.

### First Quarter | 2021

21-004 **Ross Brown and Marc Cowling:** The Geographical Impact of the Covid-19 Crisis for Firms and Jobs: Evidence from the 100 Largest Cities and Towns of the UK.

21-003 **Javier Gomez-Biscarri, Germán López-Espinosa, Andrés Mesa Toro:** Drivers of Depositor Discipline in Credit Unions.

21-002 **Manthos D. Delis, Iftekhar Hasan, Maria Iosifidi, Steven Ongena:** Gender, Credit, and Firm Outcomes.

21-001 **I-Ju Chen, Iftekhar Hasan, Chih-Yung Lin, Tra Ngoc Vy Nguyen:** Do Banks Value Borrowers' Environmental Record? Evidence from Financial Contracts.