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Organizational culture, competition and bank loan loss provisioning

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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 utilize 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 are more likely to utilize discretionary LLPs when competition increases. Moreover, banks use discretionary LLPs to smooth income and signal private information to outsiders. Banks with collaborate-dominant organizational cultures exhibit less income smoothing. Counterparts with a create-dominant organizational culture use discretionary LLPs to signal information to outside stakeholders. Finally, banks with a create-dominant organizational culture are more likely to be subject to formal regulatory enforcement actions.

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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, Hagendorff, and Eshraghi 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, Levine, and Lin 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 financial 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 and performance of non-financial firms with respect to: CEO turnover (Fiordelisi and Ricci 2014); innovation (Fiordelisi et al. 2019)

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and post-merger synergies (Doukas and Zhang 2021). However, while this literature provides valuable insights into the impact of organizational culture on non-financial firms, 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 maximize value (Hoenig and Morris 2012). Recent evidence suggests that organizational culture affects both the risk and returns of banks (Nguyen, Nguyen, and Sila 2019; Barth and 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 bank loan loss provisioning.

There are significant inherent challenges to accurately assessing how organizational culture affects loan loss provisioning under various competitive conditions. 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, Harvey, and Rajgopal 2005). Moreover, 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 relationship between organizational culture and 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, Ryan, and Zou 2018). As such, our research setting allows us to investigate if organizational culture affects bank 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 1994–2006. The year of the IBBEA enactment is chosen as the start of the sample period. In order to measure and classify organizational culture, we utilize 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 responds aggressively 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 is associated with capable processes, predictability, and control, while

the collaborate-oriented culture prioritizes employee development and empowerment (Cameron et al. 2006; Nguyen, Nguyen, and Sila 2019).

To measure organizational culture using the CVF, we follow prior literature and use textual analysis (Fiordelisi and Ricci 2014; Nguyen, Nguyen, and Sila 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 that 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 those banks with *control*- and *collaborate*-dominant organizational cultures (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).

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. In 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 utilize discretion over loan loss provisions to smooth earnings, signal future performance and manage capital. 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 stakeholders 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, Sloan, and Sweeney 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 is a 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 maintain 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. Using granular loan-level data, Nguyen, Nguyen, and Sila (2019) find that organizational culture matters to bank lending decisions, ranging from loan approval rates, loan terms to loan pricing and bank risk taking which, in turn affects 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 loan loss provisions are often used opportunistically by banks to achieve managerial objectives such as: smoothing earnings (Kanagaretnam, Lobo, and Yang 2004); signalling private information to outside stakeholders (Wahlen 1994); and managing regulatory capital (Ahmed, Takeda, and Thomas 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, Ryan, and Zou 2018; Tomy 2019). In contrast, others suggest that competition disciplines managers from pursuing aggressive use of discretionary loan loss provisions (Jiang, Levine, and Lin 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

2.1. *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 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 homogeneous, 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, organizational 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.

2.2. 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, Ou, and Kinicki 2011). Under the CVF, there are four organizational cultures, comprising create, compete, control, and collaborate.

A *Control*-dominant culture values precise communication, formalization, and routinization. Organizations exhibiting a control-dominant culture perceive that an internal focus with a well-controlled mechanism that 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 more flexible internal arrangements, which encourage trust, collaboration, open communication, and decentralized decision-making are more effective. In this regard, a collaborative culture can facilitate commitment among internal members and provide a sense of ownership and responsibility (Hartnell, Ou, and Kinicki 2011).

Organizations with a *compete*-dominant culture are focused on the external environment in pursuit of operational objectives (Hartnell, Ou, and Kinicki 2011; Fiordelisi, Raponi, and Rau 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, Ou, and Kinicki 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, Ou, and Kinicki 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, Raponi, and Rau 2015). It is worth noting that, while these cultures have different assumptions, beliefs, values, behaviours, and effective criteria, they may co-exist and complement each other within an individual organization (Hartnell, Ou, and Kinicki 2011). Prior studies document a significant impact of organizational culture on corporate performance, CEO behaviour and bank risk (Hartnell, Ou, and Kinicki 2011; Fiordelisi and Ricci 2014; Nguyen, Nguyen, and Sila 2019).

2.3. Loan loss provisioning

Bank loan loss provisioning has been studied extensively in the academic literature.⁴ Evidence suggests that banks utilize loan loss provisions to manipulate capital, smooth earnings, and signal private information to the outsiders (Ahmed, Takeda, and Thomas 1999; Kanagaretnam, Lobo, and Yang 2004; Leventis, Dimitropoulos, and Anandarajan 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 can increase loan loss provisions in order to boost capital (Beatty, Chamberlain, and Magliolo 1995). Kim and Kross (1998) and Ahmed, Takeda, and Thomas (1999) provide support for this proposition and document a negative association between bank capital and loan loss provisions.⁵

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, Krishnan, and Lobo 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 undercapitalized banks have more incentive to signal good news through loan loss provisions (Liu and Ryan 1995; Liu, Ryan, and Wahlen 1997; Kanagaretnam, Krishnan, and Lobo 2009).

2.4. 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.⁶ 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 upon the prevailing organizational culture at banks.

Prior evidence suggests that banks with compete- and create-oriented organizational cultures are more sensitive to external shocks relative to counterparts with control and collaborate cultures (Fiordelisi, Raponi, and Rau 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 in order to achieve organizational objectives (Nguyen, Nguyen, and Sila 2019). In 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 salient 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

3.1. 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 1994–2006. 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 1st and 99th percentiles of their respective distributions. The final sample comprises 370 BHCs with 2625 bank-year observations.

3.2. Measuring organizational culture

In order to quantify the four organizational cultures underpinning the CVF, we follow established practice (Fiordelisi and Ricci 2014; Fiordelisi and Ricci 2021; Fiordelisi et al. 2019; Nguyen, Nguyen, and Sila 2019). Accordingly, we apply textual analysis to the annual reports of individual banks to capture organizational culture. Compared to methods used in prior studies of organizational culture, textual analysis has two advantages.⁷ 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 textual analysis, we first identify a set of keywords that reflect each organizational culture. We then calculate the frequency of keyword appearances in annual reports. To avoid subjectivity, we follow a procedure, which utilizes 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, Nguyen, and Sila 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 1.

Once a set of keywords have been identified, we then manually retrieve all individual bank annual reports. In the US, the federal securities laws mandate publicly listed companies (including banks) 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 control, collaborate, compete, and create cultures are 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 2000 words (Nguyen, Nguyen, and Sila 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 Ricci 2014; Fiordelisi, Raponi, and Rau 2015) or a bank culture score relative (relative-to-peer approach) to its peer group (Fiordelisi et al. 2016; Nguyen, Nguyen, and Sila 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, Nguyen, and Sila 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, Raponi, and Rau 2015). 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 each year, that cultural orientation is classified as dominant.⁸

3.3. Measuring bank competition

We exploit the staggered deregulation of interstate bank branching following the Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) in 1994. The IBBEA legalized the state-wide and interstate branching that spread across the United States in the 1980s (Jiang, Levine, and Lin 2016; Burks et al. 2018). While the

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

Figure 1. Bag of words.

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. Adapted from Fiordelisi and Ricci (2021).

IBBEA eased federal restrictions on interstate banking (Section 101) and branching (Sections 102 and 103), 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 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.⁹ 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 prior or future loan loss provisioning (Dou, Ryan, and Zou 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 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 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 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, Hagendorff, and Eshraghi (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 a similar method in the present study. Thus, in our context, a zero value for the CS dummy would indicate the least competitive states, while 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.¹⁰

3.4. 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 estimating Equation (1). In order to capture the effects of competition, we also incorporate a competition indicator and interact this competition indicator with all regressors. This 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.

$$\begin{aligned}
 LLP_{ijt} = & \alpha_1 \Delta NPA_{ijt-1} + \alpha_2 \Delta NPA_{ijt} + \alpha_3 \Delta NPA_{ijt+1} + \alpha_4 \Delta Loan_{ijt} + \alpha_5 \Delta LCO_{ijt} \\
 & + \alpha_6 Size_{ijt} + \alpha_7 CS_{jt} + \alpha_8 CS_{jt} * \Delta NPA_{ijt-1} + \alpha_9 CS_{jt} * \Delta NPA_{ijt} + \alpha_{10} CS_{jt} * \Delta NPA_{ijt+1} \\
 & + \alpha_{11} CS_{jt} * \Delta Loan_{ijt} + \alpha_{12} CS_{jt} * \Delta LCO_{ijt} + \alpha_{13} CS_{jt} * Size_{ijt} + \gamma_t + \varepsilon_{ijt}
 \end{aligned} \tag{1}$$

where i , j and t denote bank, state and year, respectively. LLP_{ijt} is total loan loss provisions scaled by lagged total loans.¹¹ ΔNPA_{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, ΔNPA_{ijt-1} , and the next-period, ΔNPA_{ijt+1} . This captures the extent to which banks 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. ΔLCO_{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 each 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 each year. γ_t is the time fixed effect. ε_{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.

3.5. 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.

Table 1, Panel B, reports summary statistics of organizational 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 (equal to 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%.

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 organizational culture.

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

4.1. 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, Hagendorff, and Eshraghi (2018) to examine the impact of organizational culture on bank discretionary loan loss provisions. In order to do so,

Table 1. Summary statistics.

Panel A. Variables used for the calculation of discretionary loan loss provisions							
Variables	Definition	<i>N</i>	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
<i>LLP</i>	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 <i>t</i> and (<i>t</i> -1) to lagged total assets	2594	0.0003	0.0225	-0.0009	0.0000	0.0014
$\Delta Loan$	The change in total loans between year <i>t</i> and (<i>t</i> -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 <i>t</i> and (<i>t</i> -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
<i>CS</i>	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
Panel B. Main control variables							
Variables	Definition	<i>N</i>	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
<i>NPA</i>	The ratio of nonperforming assets to total assets	2594	0.0047	0.0045	0.0018	0.0035	0.0060
<i>ROA</i>	Return on average assets which is net income divided by average total assets	2593	0.0119	0.0040	0.0097	0.0119	0.0143
$\Delta Loan$	The change in total loans between year <i>t</i> and (<i>t</i> -1) to lagged total loans	2594	0.1439	0.1605	0.0526	0.1113	0.1911
$\Delta Deposit$	The change in total deposits between year <i>t</i> and (<i>t</i> -1) to lagged total deposits	2594	0.1276	0.1580	0.0348	0.0864	0.1665
<i>EBTP</i>	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 <i>t</i> and (<i>t</i> -1)	2594	0.0541	0.0237	0.0398	0.0515	0.0687
Population growth	The State's population growth between year <i>t</i> and (<i>t</i> -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
Δ Loan	0.127	0.136	0.152	0.134	0.151
Δ 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.

we compare the extent to which banks located in states with more competition engage in more discretionary 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. *DiscretionaryLLP* is discretionary loan loss provisions measured by the absolute value of the residuals 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 organizational 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 (Kanagaretnam, Krishnan, and Lobo 2009; Bushman and Williams 2012; Jiang, Levine, and Lin 2016; Dou, Ryan, and Zou 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 by one year to mitigate concerns regarding endogeneity. All regressions include bank fixed effects (δ_i) and year fixed effects (γ_t). $\varepsilon_{i,t}$ is the error term clustered at the state-level.

The coefficient, β_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 β_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 β_1 would suggest the opposite.

4.2. 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 with these two external organizational 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, Ou, and Kinicki 2011; Nguyen, Nguyen, and Sila 2019). Given that the two internal (external) organizational cultures share important characteristics, we aggregate them to internal and external dimensions (following Barth and Mansouri 2021 and Fiordelisi, Raponi, and Rau 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 culture scores are among the top quantile of all banks each 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 culture scores fall in the top quantile of all banks each 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.

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.¹² The coefficient on the external-dominant and competition interaction variable in Column (2) shows that banks with an externally focused culture increase discretionary loan loss provision by 29% compared to counterparts with other organizational cultures.

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, Ou, and Kinicki 2011; Fiordelisi, Raponi, and Rau 2015). In contrast, externally-dominant organizational cultures (the compete- and create-culture) share a risky attitude and have a strong orientation towards growth (Fiordelisi, Raponi, and Rau 2015; Nguyen, Nguyen, and Sila 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, Raponi, and Rau 2015). These banks tend to engage in risk-taking behaviour in order to achieve short- and immediate-term growth (Fiordelisi, Raponi, and Rau 2015).

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

	Internal-dominant (1)	External-dominant (2)	Both dimensions (3)
Internal-dominant	0.226 (0.188)		0.238 (0.159)
Internal-dominant*CS	-0.391* (0.213)		-0.405** (0.187)
External-dominant		-0.445** (0.199)	-0.452*** (0.149)
External-dominant*CS		0.631*** (0.226)	0.639*** (0.179)
CS	0.418 (0.267)	-0.021 (0.248)	0.148 (0.239)
Size	-0.113 (0.366)	-0.167 (0.364)	-0.146 (0.243)
Age	-0.582 (0.470)	-0.571 (0.470)	-0.610* (0.333)
NPA	83.385*** (24.010)	86.303*** (24.125)	86.392*** (20.320)
ROA	-0.929 (7.039)	-1.867 (6.981)	-1.814 (5.828)
Δ Loan	-1.456** (0.606)	-1.483** (0.598)	-1.469*** (0.562)
Δ Deposit	1.500*** (0.572)	1.507*** (0.559)	1.505*** (0.523)
Capital	3.007 (5.263)	4.133 (5.172)	4.051 (4.399)
GDP Growth	0.536 (3.389)	0.349 (3.368)	0.198 (2.949)
Population Growth	0.556** (0.266)	0.527** (0.267)	0.543*** (0.209)
Constant	3.955 (5.278)	4.929 (5.228)	4.639 (3.518)
Bank FE	YES	YES	YES
Year FE	YES	YES	YES
R-squared	0.476	0.478	0.479
Observations	2559	2559	2559

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.

4.3. 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, Nguyen, and Sila 2019).

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 (0.218)				0.201 (0.221)
Control-dominant*CS	-0.342 (0.255)				-0.398 (0.258)
Collaborate-dominant		0.308* (0.184)			0.294* (0.176)
Collaborate-dominant*CS		-0.359* (0.201)			-0.351* (0.198)
Compete-dominant			-0.369* (0.215)		-0.398* (0.224)
Compete-dominant*CS			0.563** (0.253)		0.621** (0.258)
Create-dominant				-0.486** (0.201)	-0.448** (0.203)
Create-dominant*CS				0.636** (0.251)	0.601** (0.257)
CS	0.311 (0.245)	0.379 (0.261)	0.091 (0.245)	0.120 (0.241)	0.141 (0.272)
Size	-0.114 (0.365)	-0.138 (0.370)	-0.146 (0.368)	-0.162 (0.369)	-0.156 (0.362)
Age	-0.561 (0.469)	-0.561 (0.474)	-0.540 (0.475)	-0.604 (0.469)	-0.629 (0.464)
NPA	83.565*** (24.044)	83.725*** (23.874)	84.557*** (24.151)	85.483*** (23.854)	87.239*** (24.098)
ROA	-1.109 (6.990)	-0.873 (7.041)	-1.363 (7.015)	-1.767 (6.939)	-2.132 (6.981)
Δ Loan	-1.477** (0.601)	-1.457** (0.609)	-1.475** (0.602)	-1.497** (0.600)	-1.494** (0.600)
Δ Deposit	1.509*** (0.566)	1.515*** (0.570)	1.503*** (0.564)	1.538*** (0.557)	1.558*** (0.559)
Capital	3.199 (5.272)	3.150 (5.341)	3.655 (5.241)	3.688 (5.240)	4.386 (5.180)
GDP Growth	0.604 (3.389)	0.521 (3.407)	0.444 (3.393)	0.617 (3.381)	0.146 (3.384)
Population Growth	0.558** (0.267)	0.544** (0.266)	0.539** (0.268)	0.521* (0.269)	0.540** (0.267)
Constant	3.977 (5.281)	4.239 (5.312)	4.488 (5.291)	4.889 (5.308)	4.807 (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	2559	2559	2559	2559	2559

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.

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. 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 estimate 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 organizational 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 utilize discretionary loan loss provisions. This finding confirms Hypothesis H1a. The coefficient on the interaction term, collaborate-dominant*CS is negative and statistically significant, which suggests that banks with collaborate-dominant organizational culture reduce discretionary loan loss provisions by 16.5% relative to other banks.

In contrast, the coefficients of compete-dominant*CS (Column (3)) and create-dominant*CS (Column (4)) are positive and statistically 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 organizational 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 a compete-dominant organizational 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 organizational culture are more aggressive in pursuing growth relative to counterparts with a create-dominant culture (Cameron et al. 2006; Hartnell, Ou, and Kinicki 2011; Nguyen, Nguyen, and Sila 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 provisioning. 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 utilize 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 ($\Delta Loan$) 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 driven by demand side factors would reduce loan-loss provisions. In contrast, deposit growth ($\Delta Deposit$) 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, Dimitropoulos, and Anandarajan 2011). Population growth implies that an increase in year-end market size could increase bank discretionary loan loss provisions (Dou, Ryan, and Zou 2018). However, neither of these macroeconomic variables are significant in our empirical analysis.

4.4. Robustness tests

4.4.1. Parallel trend assumption

A 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 taken place.

To complement the parallel trend assumption, and to alleviate concerns that our results could be driven by omitted factors other than the state deregulation that occurred during the sample period, we follow Berger, Öztekin, and Roman (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 is statistically significant, our difference-in-difference estimates reported earlier are biased because of unobservable factors other than the deregulation.

For the first falsification test, we randomly assign individual states into each of the deregulation years but leave the 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.

4.4.2. 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).

4.5. 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, Levine, and Lin 2016; Dou, Ryan, and Zou 2018). We then use this alternative DLLP as the dependent variable in Equation (2). The results presented in Column (4) are consistent with the baseline findings.

Another potential problem is that our results could 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. The results reported in Column (5) of Table 6 are consistent with the baseline findings.

4.6. Reverse causality

One may argue that DLLP of banks in a state could drive the state's decision to deregulate the banking market. To mitigate this concern, we follow prior literature (Krishnan, Nandy, and Puri 2015; Berger, Öztekin, and Roman 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.

Table 5. Falsification tests.

	Placebo deregulation date (1)	Placebo competitive state (2)
Control-dominant	0.097 (0.150)	-0.146 (0.142)
Control-dominant*CS	-0.277 (0.183)	0.241 (0.219)
Collaborate-dominant	0.231* (0.133)	0.136 (0.134)
Collaborate-dominant*CS	-0.286 (0.181)	-0.092 (0.217)
Compete-dominant	-0.204 (0.181)	-0.040 (0.144)
Compete-dominant*CS	0.298 (0.195)	-0.060 (0.188)
Create-dominant	-0.148 (0.165)	-0.124 (0.157)
Create-dominant*CS	0.084 (0.164)	0.035 (0.174)
CS	0.047 (0.115)	-0.006 (0.120)
Size	-0.146 (0.370)	-0.130 (0.371)
Age	-0.548 (0.468)	-0.555 (0.470)
NPA	85.416*** (24.106)	84.557*** (24.115)
ROA	-0.507 (6.900)	-0.755 (6.934)
$\Delta Loan$	-1.531** (0.604)	-1.465** (0.599)
$\Delta Deposit$	1.558*** (0.569)	1.503*** (0.559)
Capital	3.097 (5.288)	3.066 (5.337)
GDP Growth	0.668 (3.384)	0.582 (3.391)
Population Growth	0.566** (0.268)	0.554** (0.271)
Constant	4.516 (5.337)	4.365 (5.349)
Bank FE	YES	YES
Year FE	YES	YES
R-squared	0.477	0.476
Observations	2559	2559

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.

4.7. 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, Nguyen, and Sila (2019) and augment the bag of words to include potentially omitted words reflecting bank culture. These words (selected

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 (0.228)	0.353 (0.291)	0.196 (0.221)	0.224 (0.217)	0.138 (0.249)	0.196 (0.221)	0.225 (0.222)	0.208 (0.219)
Control-dominant*CS	-0.353 (0.261)	-0.636* (0.329)	-0.386 (0.257)	-0.383 (0.253)	-0.342 (0.283)	-0.394 (0.258)	-0.103 (0.066)	-0.388 (0.255)
Collaborate-dominant	0.270 (0.180)	0.582*** (0.191)	0.302* (0.176)	0.309* (0.169)	0.286 (0.195)	0.290 (0.176)	0.356* (0.195)	0.294* (0.176)
Collaborate-dominant*CS	-0.370* (0.213)	-0.798*** (0.226)	-0.358* (0.198)	-0.369* (0.189)	-0.338 (0.212)	-0.348* (0.199)	-0.113* (0.063)	-0.352* (0.198)
Compete-dominant	-0.393** (0.192)	-0.694** (0.271)	-0.401* (0.224)	-0.430* (0.225)	-0.376 (0.240)	-0.397* (0.224)	-0.415** (0.201)	-0.398* (0.223)
Compete-dominant*CS	0.630** (0.245)	1.024*** (0.319)	0.616** (0.257)	0.699*** (0.259)	0.602** (0.272)	0.624** (0.259)	0.157** (0.063)	0.620** (0.258)
Create-dominant	-0.468** (0.202)	-0.584** (0.253)	-0.466** (0.201)	-0.456** (0.206)	-0.516** (0.219)	-0.441** (0.203)	-0.472** (0.192)	-0.448** (0.203)
Create-dominant*CS	0.607** (0.260)	0.724** (0.299)	0.618** (0.255)	0.625** (0.258)	0.671** (0.270)	0.588** (0.258)	0.153** (0.071)	0.599** (0.257)
CS	-0.111 (0.219)	0.175 (0.290)	0.065 (0.260)	-0.053 (0.251)	0.131 (0.280)	0.031 (0.274)	0.026 (0.072)	0.143 (0.272)
Pre1						-0.115 (0.418)		
Pre2						-0.188 (0.322)		
Constant	1.326 (4.771)	1.113 (5.776)	43.648 (42.477)	6.028 (5.744)	5.321 (5.374)	4.952 (5.218)	4.986 (3.559)	6.082 (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	2559	1729	2559	2559	2426	2559	2559	2559

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.

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, Farina, and Fiordelisi (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.

4.8. 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 must 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 A4 are not significant.

5. Organizational culture and incentives to utilize discretionary LLP

The results presented in this study suggest that organizational culture affects discretionary loan loss provisioning. In this section, we examine the motivations for utilizing discretion over loan loss provisions by banks with different cultures when faced with more competition. 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, Shackelford, and Wahlen 1995; Liu, Ryan, and Wahlen 1997; Kanagaretnam, Lobo, and Yang 2004; Kanagaretnam, Krishnan, and Lobo 2009; Curcio and Hasan 2015).¹³

5.1. 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, Shackelford, and Wahlen 1995; Kanagaretnam, Lobo, and Yang 2004). They can also manage to 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 those banks overstate loan loss provisions when incomes are high and understate loan loss provisions when incomes are low. Specifically, Equation (2) is modified as follows:

$$\begin{aligned} \text{Discretionary LLP}_{i,t} = & \beta_1 \text{Culture}_{i,t} * \text{CS}_{j,t} * \text{EBTP}_{i,t} + \beta_2 \text{Culture}_{i,t} \\ & + \beta_3 \text{CS}_{j,t} + \beta_4 \text{EBTP}_{i,t} + X_{i,t} + \delta_i + \gamma_t + \varepsilon_{i,t} \end{aligned} \quad (3)$$

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.

5.2. 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,

Lobo, and Yang 2004; Kanagaretnam, Krishnan, and Lobo 2009). This is partly because market participants infer those 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.

Table 7. Culture and motivation to use discretionary LLPs.

	Income Smoothing (1)	Signalling Behaviour (2)
Control-dominant	0.176 (0.223)	0.326 (0.238)
Control-dominant*CS	-1.327** (0.554)	-0.672** (0.273)
Collaborate-dominant	0.288 (0.235)	0.135 (0.280)
Collaborate-dominant*CS	0.953 (0.650)	-0.136 (0.398)
Compete-dominant	-0.391 (0.262)	-0.309 (0.224)
Compete-dominant*CS	0.169 (0.493)	0.579 (0.316)
Create-dominant	-0.378 (0.216)	-0.102 (0.255)
Create-dominant*CS	0.260 (0.508)	0.408 (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* Δ EBTP _{t+1}		0.490 (0.272)
Collaborate-dominant*CS* Δ EBTP _{t+1}		-0.391 (0.263)
Compete-dominant*CS* Δ EBTP _{t+1}		-0.056 (0.046)
Create-dominant*CS* Δ EBTP _{t+1}		0.731** (0.257)
CS	0.094 (0.336)	0.238 (0.285)
EBTP	-0.116*** (0.020)	
Δ EBTP _{t+1}		0.035 (0.035)
Constant	1.642 (4.405)	-1.046 (1.281)
Controls	YES	YES
Bank FE	YES	YES
Year FE	YES	YES
R-squared	0.522	0.152
Observations	2559	2559

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 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.

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:

$$\begin{aligned} \text{Discretionary LLP}_{i,t} = & \beta_1 \text{Culture}_{i,t} * \text{CS}_{j,t} * \Delta EBTP_{i,t+1} + \beta_2 \text{Culture}_{i,t} + \beta_3 \text{CS}_{j,t} \\ & + \beta_4 \Delta EBTP_{i,t+1} + X_{i,t} + \delta_i + \gamma_t + \varepsilon_{i,t} \end{aligned} \quad (4)$$

Column (2) of Table 7 reports the results. The estimated coefficient on $\text{Create-dominant} * \text{CS} * \Delta EBTP_{i,t+1}$ 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 a *create* organizational culture tends to focus more on the external environment, these banks tend 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, Sloan, and Sweeney 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 utilize the following logit model:

$$\text{Pr}(\text{Enforcement}_{i,t}) = \beta_1 \text{Culture}_{i,t} * \text{CS}_{j,t} + \beta_2 \text{Culture}_{i,t} + \beta_3 \text{CS}_{j,t} + X_{i,t} + \varepsilon_{i,t} \quad (5)$$

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) each 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, Staikouras, and Tsoumas 2019).

We follow the previous literature (Fiordelisi, Raponi, and Rau 2015; Delis, Staikouras, and Tsoumas 2019) and hand-collect data on supervisory enforcement actions from the FRB, FDIC, and OCC websites.¹⁴ 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.

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 $\text{Create-dominant} * \text{CS}$ in Columns (4) and (5). This result is in line with the proposition that create-dominant banks tend to break rules more frequently (Fiordelisi, Raponi, and Rau 2015), and are therefore subject to more supervisory scrutiny and sanction.

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 (0.027)				0.002 (0.027)
Control-dominant*CS	0.005 (0.031)				0.004 (0.031)
Collaborate-dominant		0.002 (0.024)			−0.005 (0.024)
Collaborate-dominant*CS		−0.007 (0.028)			0.003 (0.029)
Compete-dominant			0.009 (0.029)		0.012 (0.029)
Compete-dominant*CS			−0.021 (0.034)		−0.022 (0.034)
Create-dominant				−0.060** (0.025)	−0.061** (0.025)
Create-dominant*CS				0.066** (0.031)	0.066** (0.030)
CS	0.030 (0.029)	0.033 (0.031)	0.037 (0.030)	0.019 (0.031)	0.023 (0.034)
Size	0.053 (0.039)	0.053 (0.039)	0.054 (0.039)	0.049 (0.039)	0.050 (0.039)
Age	−0.101*** (0.037)	−0.101*** (0.037)	−0.101*** (0.037)	−0.107*** (0.036)	−0.108*** (0.037)
NPA	2.703* (1.579)	2.736* (1.582)	2.686* (1.581)	2.934* (1.587)	2.848* (1.598)
ROA	0.567 (0.661)	0.564 (0.661)	0.573 (0.661)	0.474 (0.659)	0.489 (0.663)
Δ Loan	0.001 (0.062)	0.001 (0.062)	0.001 (0.062)	−0.002 (0.062)	−0.001 (0.062)
Δ Deposit	0.014 (0.063)	0.013 (0.063)	0.012 (0.063)	0.017 (0.063)	0.016 (0.063)
Capital	−0.277 (0.487)	−0.277 (0.490)	−0.282 (0.487)	−0.242 (0.484)	−0.256 (0.486)
GDP Growth	0.746** (0.366)	0.744** (0.368)	0.747** (0.367)	0.734** (0.363)	0.741** (0.364)
Population Growth	0.007 (0.029)	0.008 (0.029)	0.008 (0.029)	0.006 (0.029)	0.006 (0.029)
Constant	−0.441 (0.589)	−0.443 (0.587)	−0.457 (0.587)	−0.352 (0.584)	−0.365 (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	3003	3003	3003	3003	3003

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.

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.

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 make 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 a subsequent 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.

Notes

1. Organizational 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.
3. This line of research (as reviewed in Berger, Molyneux, and Wilson 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, Lin, and Xie 2021); increased voluntary information disclosures (Burks et al. 2018); reduced bank failure; improved bank profitability (Goetz 2018); increased wages for workers (Beck, Levine, and Levkov 2010); increased corporate productivity (Krishnan, Nandy, and Puri 2015), investment (Zarutskie 2006), and innovation (Cornaggia et al. 2015).
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, Mora, and Porcuna-Enguix 2019); regulatory pressure (Ahmed, Takeda, and Thomas 1999; Hamadi et al. 2016); and product market competition (Jiang, Levine, and Lin 2016) all affect bank loan loss provisioning. Moreover, evidence pertaining to the internal dynamics of banks suggests that: ownership concentration (Bouvatier, Lepetit, and Strobel 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 the underlying factors 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).
5. 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, Dimitropoulos, and Anandarajan 2011). This is partly because the Basel Accord excluded loan loss provisions (LLPs) 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 LLPs 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 LLPs to smooth earnings reported to regulators and market participants (Collins, Shackelford, and Wahlen 1995).

Specifically, banks can smooth earnings by understating LLPs when future earnings are perceived to be low, and vice-versa (Kanagaretnam, Lobo, and Yang 2004).

6. Prior evidence suggests that competition affects bank capital structure (Allen, Carletti, and Marquez 2011), customer orientation (Degryse and Ongena 2007), and bank stability (Goetz 2018). Dick and Hannan (2010) and Degryse, Acevedo, and Ongena (2019) provide extensive reviews of the bank competition literature.
7. Prior literature uses several different approaches to quantify culture ranging from annual rankings of organizations, laboratory experiments, interviews, questionnaires and surveys (Guiso, Sapienza, and Zingales 2015; Jones 2005).
8. In robustness tests, we alternatively treat bank culture as time-invariant because Nguyen, Nguyen, and Sila (2019) argue that mature and large banks tend to have an overarching organizational culture that do not easily shift in the short run. Second, we measure bank culture using absolute values (as in Fiordelisi and Ricci 2014) in order to address the concern that a bank's organizational culture could be forced to change given that this depends on the culture scores of other banks in the same year. The results of these estimations, reported in Table A1, Column (1) and (2) respectively are consistent with the baseline time-varying and relative-to-peer measures of organizational culture. Table A2 of the Appendix shows the evolution of bank culture over the sample period from 1994 to 2006 using time-varying approach.
9. See Johnson and Rice (2008), among others, for detailed discussions.
10. Table A3 in the Appendix presents the timing of interstate branching deregulations from 1994 to 2004. The competition level (Nguyen, Hagendorff, and Eshraghi 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.
11. In order to avoid extremely small coefficients, we rescale 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, Ryan, and Zou (2018) and transform loan-loss-provision-to-lagged-assets (LLP) to loan-loss-provision multiplied by 1000 all divided by lagged assets. This allows for an easier interpretation of the coefficients.
12. $18\% = -0.391 / 2.163$ (the coefficient of the interaction term between culture and competition divided by the mean value of discretionary loan loss provision).
13. 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 find no evidence of capital management in the sample. The results are available upon request.
14. 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>.

Disclosure statement

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