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Learn by Doing or Learn by Failing? The Paradoxical Effect of Public Policy in Averting the Liability of Newness

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Learn by Doing or Learn by Failing? The Paradoxical Effect of Public Policy in Averting the Liability of Newness

Michael L. DeVaughn[1] and Myleen M. Leary[2]

Abstract

Public policy regulations, designed to legitimate and protect fragile, fledgling new firms from failure, on the surface, appear to be of great value. According to Stinchcombe, to the extent that such policies serve as "standard social routines," they may even work to decrease the liability of newness. Using a sample of more than 2,600 new banks chartered in the United States over a 15-year span under the supervision of three different regulatory agencies, we find that failure rates vary according to nuances in the differences in regulations levied by these agencies. Paradoxically, banks that are initially subject to more stringent regulations, intended to limit their strategic choices to a set of "safe and sound" practices, and protect them from failure during their early stages of existence, in fact, have a higher likelihood of failure after those restrictive regulations are lifted. Our results suggest that public policy attempts to thwart the liability of newness are in fact a "fix that fails," as public policy regulations designed to reduce the liability of newness merely delay the inevitable.

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Introduction

Although it has been more than five decades since Stinchcombe's (1965) liability of newness construct was first introduced into the organizations literature, the idea continues to be one of the most enduring phenomena to describe the difficulties and higher incidences of failure that new firms face relative to more established firms in their industry (Thornhill & Amit, 2003). Due to new organizations' lack of reputational capital, organizational routines, and/or legitimacy with stakeholders, policy makers have focused their attention on interventions that might mitigate these characteristics of the liability of newness. Amezcua, Grimes, Bradley, and Wiklund (2013) point out that actors such as governments and universities often sponsor enterprises such as business incubators with the belief that the activities that take place within these organizations are effective in helping new firms overcome the liability newness. Our goal is to test whether public policies designed to limit the activities of new firms and therefore reduce the likelihood of risky strategic choices actually reduce the liability of newness and increase the survival prospects of new firms.

Research on government-based policy efforts is not uncommon in the entrepreneurship literature. Chrisman and various colleagues (e.g., Chrisman, 1999; Chrisman & McMullan, 2000, 2004) have studied the effectiveness of U.S. Small Business Development Centers (SBDCs) in improving the survival odds of small and nascent businesses. In another example, Solomon, Bryant, May, and Perry (2013) investigated the effectiveness of entrepreneurial development programs sponsored by the U.S. Small Business Administration (SBA) and found that the assistance provided by such programs was successful in reducing failure rates. Government-sponsored SBA and SBDC programs work by providing new firms with training and access to information and knowledge from experienced managers to facilitate the formation of successful organizational routines, processes for accomplishing organizational tasks, in the new firm. Such programs represent an effort by government policy makers to mitigate the effects of the liability of newness. Although the successful completion of a program of this type may provide legitimacy to external stakeholders, government support of these programs represent an *indirect* effort to manage the risks inherent in new venture formation and increase the likelihood of new firm survival.

By contrast, we are focused on the question of how *direct* policy devices, such as government regulations, rather than indirect or intermediated devices

such as program sponsorship, endorsement, or outside assistance, affect a firm's ability to overcome the liability of newness. We concentrate on new firms in the U.S. commercial banking industry, where strict temporary regulations are in place to protect fledgling new banks from failure during a period of acute vulnerability in their early years. Although well-intentioned, we argue that these regulations hinder the development of successful organizational routines and differentially limit the organizational learning capacity of new banks, making them vulnerable to failure. And as such, these regulations may not eliminate the liability of newness, but merely shift its temporal effects. Finally, to understand the impact of the dynamics of government regulations and failure *within* a population of new firms, we also examine whether new banks are likely to experience differences in failure rates based on variations in the regulations that they face.

Although our study adds to a large body of work that investigates the liability of newness phenomenon, it also covers new ground by focusing on the value of direct, rather than indirect, government policy-based interventions for managing the liability of newness. As Stinchcombe (1965) does not specifically refer to the impact of regulations, our research contributes to the liability of newness literature by identifying an additional external factor that should be accounted for in assessing the prospects of new firm survival. Our work also shows how government regulations, if not carefully implemented, can have a disparate impact on how some new firms handle the liability of newness relative to others. The next section will outline our hypotheses about the direct effects of government regulations on new firms' short- and long-term performance.

Theory and Hypotheses

Organizational Learning and the Liability of Newness

Stinchcombe's (1965) groundbreaking work argued that new firms were susceptible to failure because of a liability of newness. Stinchcombe (1965) ascribed the liability of newness to a discrete set of reasons that are both internal and external to the organization (Aldrich & Auster, 1986; Hannan & Freeman, 1984). Internally, a new firm is susceptible to the liability of newness because as a new organization, members need to learn new skills, roles, and routines (Stinchcombe, 1965); Wiklund, Baker, and Shepherd (2010) refer to these issues as "organizational learning problems" (p. 425). Externally, new firms are susceptible to the liability of newness because they lack ties and legitimacy with external stakeholders (Aldrich, 1999; Wiklund et al., 2010), a view that is also consonant with an institutional theory perspective

of firm failure (Deephouse, 1996; DiMaggio & Powell, 1983; Singh, Tucker, & House, 1986). Moreover, these external challenges have also been framed in terms of organizational learning—the need to learn about the environment in which the firm is to do business (Wiklund et al., 2010).

Close observers of Stinchcombe's (1965) original article note that challenges associated with organizational learning underpin the causes of the liability of newness (Thornhill & Amit, 2003; Wiklund et al., 2010). Internally, Stinchcombe (1965) himself points out that "social relations among strangers" (p. 149) in new firms create learning costs that existing firms do not incur. Managers in new firms must learn new roles and routines for accomplishing tasks within the firm (Gong, Baker, & Miner, 2004; Nelson & Winter, 1982; Stinchcombe, 1965). These internal liabilities are costly from a time and efficiency standpoint and exert additional pressure on the already fragile, resource constrained new firm, increasing the likelihood of organizational failure (Wiklund et al., 2010).

The need to learn about the stakeholders and environment in which a new firm operates is an external causal factor in the liability of newness (Wiklund et al., 2010). Because new firms start from scratch, they must learn how to effectively engage important stakeholders. They must establish legitimacy with important resource groups such as financiers, customers, and suppliers (Deephouse, 1996; DiMaggio & Powell, 1983; Singh et al., 1986; Suchman, 1995). More important, a new firm must learn how to survive in a new environment (Aldrich & Auster, 1986; Thornhill & Amit, 2003), acquiring knowledge from and about an evolving, dynamic market and quickly transforming it into a competence that will bolster its prospects of survival (Sorenson & Stuart, 2000).

Baum and Ingram (1998) deem such activities "survival-enhancing" learning. Defined as a type of learning outcome that occurs when experience decreases an organization's risk of failure, survival-enhancing learning has been recognized by several studies (e.g., Argote, Ingram, Levine, & Moreland, 2000; Dencker, Gruber, & Shah, 2009; Kim, Kim, & Miner, 2009; Kim & Miner, 2007) since Baum and Ingram's (1998) original articulation. Although survival-enhancing learning does not always identify the individual detailed processes by which learning happens at the level of the organization, it can decrease the likelihood of failure. This is because individual-level experience is transformed into organization-level experience using supra-individual repositories (Argote & Miron-Spektor, 2011). For example, individual experience can be encoded and embedded into organizational routines—processes for accomplishing organizational tasks—which can serve as such a vehicle. Furthermore, research on vicarious learning (e.g., Haunschild & Miner, 1997; Huber, 1991; Kim & Miner, 2007) argues that organizational routines are

externally observable from a distance and are frequently replicated by other organizations.

Behavioral learning theorists (e.g., Cyert & March, 1963; Levitt & March, 1988; Nelson & Winter, 1982) have long argued that firms become more adaptive through organizational learning. As firms gain experience, they learn and expand their library of organizational routines by encoding them into organizational memory for use when needed (Levitt & March, 1988; Nelson & Winter, 1982). Because of this, firms with broader and deeper experiences possess a greater learning capacity than firms that lack such experiences. It follows that devices that limit a new firm's ability to accumulate broad experiences are likely to contribute to the liability of newness.

Strict regulation can serve as such device. In the U.S. banking industry, regulators restrict fledgling new banks to a finite set of activities that are deemed "safe and sound" given the new bank's relative immaturity. Thus, if these strict regulations limit the number of permissible practices in which banks can engage, then regulation can have a direct impact on the domain and content of learning and affect the nature of the experience that banks can acquire (DeVaughn, 2003). However, new banks that face fewer constraints on their behavior have more opportunities to acquire different experiences and thus may demonstrate a greater learning capacity. For example, the "one obligor" concept in banking imposes lending limits on the amount of money banks can lend to a single related entity. Although the purpose of this regulation is to enforce diversification of loan risks (Lovett, 2001), it also serves to limit potential variation in experience by circumscribing lending practices to relatively homogeneous, safe, and low-risk behaviors. As a result, banks acquire limited organizational skills to manage the more complex, riskier lending activities that might be important to their future success.

Although strict regulations in general can be problematic, even a small variation in how the regulations apply to members of a population can have a big impact on how and what members learn (Berta, 2000; Garten, 1991). For example, Berta (2000) showed that a variation in the regulatory environment for assisted living facilities in Canada incentivized some firms to acquire specific types of experience at the expense of others. In addition, variation in regulations can protect some firms more than others from competitive environmental forces, resulting in differential opportunities for organizational learning, routine, and skill development. Firms with greater levels of regulatory protection have fewer incentives to search (Miller & Chen, 1996) and improve organizational practices (Barnett, Greve, & Park, 1994). In short, variation in regulation can cause some firms to learn more effectively than others.

Failure During the Extra-Normal Regulation Period

The U.S. commercial banking industry represents a context where strict regulations for new firms are prevalent. The regulations themselves appear to be a response to the effect of the liability of newness. For example, each of the three major federal U.S. bank regulatory agencies (the Federal Deposit Insurance Corporation [FDIC], the Federal Reserve Bank [FRB], and the Office of the Comptroller of the Currency [OCC]) imposes stricter rules, for a period of time, for new banks than for existing banks (DeVaughn, 2003). These "extra-normal" regulations are aimed at protecting the new bank during a period of financial fragility where its survival chances are low (DeYoung, 1999, 2000). After the period of extra-normal protection (the first 3 years of bank operations), a new bank is no longer subject to these stricter extra-normal regulations and, instead, must transition into the same regulations as existing banks. These extra-normal regulations exist to protect new firms and, therefore, embody the basic logic of the liability of newness argument—new firms are more prone to failure than existing firms.

Although the duration of these stricter rules for new banks is uniform across all three federal bank regulatory agencies, the application of the rules, specifically how and to whom they apply, are not. This variation means that within a population of new banks, different banks face different regulatory environments during their period of extra-normal regulations. A new bank's charter type (i.e., nonmember state bank, member state bank, or national bank), a choice determined by a bank's founders during the startup process, establishes which regulatory agency (i.e., FDIC, FRB, or OCC) will be its primary federal regulator. The degree to which these regulations vary will affect the regulatory environment that each bank will face and, in turn, will have important implications for organizational learning. Table 1 shows the variation in select regulations for new banks by federal bank regulator.

Although it is worth noting that there is overlap in many of the basic new bank regulations levied by the three agencies, the differences among them are important. For example, although all three regulators require new banks to maintain higher than normal (compared with existing banks) equity capital levels, new banks regulated by the FRB are required to hold far more equity capital in reserve than new banks regulated by the OCC (at least 9% of total assets vs. 5% of total assets). This variation in stringency constitutes a meaningful difference in the regulatory environments faced by new banks. This difference has important implications for new firm performance as there are opportunity costs to holding additional capital in reserve (i.e., forgone opportunities to invest this capital in bank loans at more attractive rates of return).

Table 1. Select Regulations by Federal Bank Agency.

	More stringent		Less stringent
	FDIC-regulated nonmember banks	FRB-regulated member state banks	OCC-regulated national banks
Equity rules	8% equity requirement	9% equity requirement	5% "well-capitalized" equity requirement
Profit rules	Reach profitability by end of third year	No time-dependent profitability requirement	No time-dependent profitability requirement
Bank exam rules	Bank exam at least once every 12 months	Bank exam at the end of 1st quarter, at the end of 3rd quarter, and at 6-month intervals until a CAMEL rating of "1" or "2"	Bank exam once every 12 months and may be extended to every 18 months

Source. FDIC Statement of Policy, FRB Application and Supervision Standards for De Novo State Member Banks, Comptroller's Licensing Manual & A Guide to the National Banking System.
Note. FDIC = Federal Deposit Insurance Corporation; FRB = Federal Reserve Bank; OCC = Office of the Comptroller of the Currency; CAMEL = Capital adequacy, Asset quality, Management, Earnings, Liquidity.

Taken together, a new bank's charter type (nonmember state bank, member state bank, or national bank) determines its primary federal bank regulator (FDIC, FRB, or OCC). This, in turn, establishes the stringency of the regulatory environment that a new bank will encounter. Thus, a new bank's charter type can serve as a proxy for the level of intensity it faces in its regulatory environment. This allows us to hypothesize about the effect and efficacy of restrictive, protection-oriented regulations in reducing failure and avoiding the impact of the liability of newness for new firms.

One of the more dramatic differences in regulation lies in the comparison between new national banks and new state-chartered banks (i.e., nonmember state banks and member state banks) during the extra-normal regulation period. Compared with FDIC-regulated, nonmember state banks and FRB-regulated, member state banks, OCC-regulated national banks face far less stringent regulations. Unlike FRB-regulated banks, OCC-regulated banks face lower equity capital requirements and are subject to less frequent bank examinations. When compared with FDIC-regulated banks, OCC-regulated, national banks do not face the same specific, time-dependent profit targets (i.e., "break-even" profit by the end of third-year operations) that FDIC-regulated banks do.

Moreover, OCC-regulated, national banks have typically enjoyed more liberal bank chartering and bank supervisory policies (DeYoung, 1999; Rehm, 1989). The net effect of this wide discretion means that national banks enjoy more latitude to experiment with a wider variety of riskier bank practices during the extra-normal regulation period than other bank types and have the opportunity to acquire a great deal of learning.

However, this wide discretion also means that national banks may enjoy less protection from failure than the other types of banks during the extra-normal regulation period. This notion is underscored in Rehm's (1989) account of the Comptroller of the Currency's (the chief executive of the OCC regulatory agency) statement regarding new banks: "The agency [OCC] should not restrict startups just to prevent possible failures." Therefore, for this reason, it is expected,

Hypothesis 1 (H1): OCC-regulated (national) banks will experience the highest failure rates of the three bank types during the extra-normal regulation period (i.e., national bank > nonmember state bank or member state bank).

Within state-chartered banks, it is not clear, a priori, which bank type is afforded greater protection during the extra-normal regulation period. Whereas new FRB-regulated member state banks, for example, face higher equity capital requirements and are subject to more frequent bank examinations ("monitoring requirements") than new FDIC-regulated nonmember state banks, new FDIC-regulated banks have stringent, time-dependent profit ("performance requirements") targets that must be met by the end of the extra-normal regulation period. New FRB-regulated banks are not subject to such performance requirements. If FRB-regulated member state banks' intense monitoring requirements and high-equity capital requirements indeed provide more protection, then it is expected that member state banks will exhibit the lowest failure rates during the regulation period.

Hypothesis 2a (H2a): FRB-regulated (member state) banks will experience the lowest failure rates during the extra-normal regulation period (i.e., member state bank < nonmember state bank < national bank).

By contrast, FDIC-regulated nonmember state banks must meet specific profit targets (performance requirements) by the end of the extra-normal regulation period. This may ultimately be considered more stringent and thus provide a greater degree of protection. The FDIC Statement of Policy mandates that new banks reach profitability (at least break-even status) after a "reasonable" period

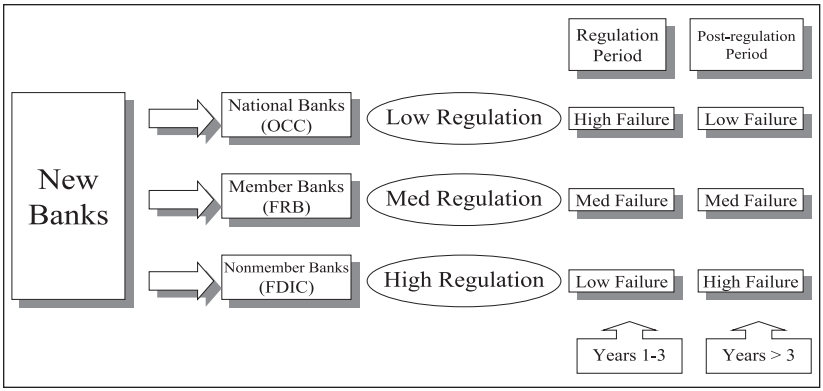

Figure 1. Levels of regulation intensity associated with bank types.
Note. OCC = Office of the Comptroller of the Currency; FRB = Federal Reserve Bank; FDIC = Federal Deposit Insurance Corporation.

of time (interpreted to be 3 years by FDIC regulators). By ensuring that nonmember state banks are involved in practices that move them toward profitability, the FDIC provides a layer of protection against premature bank failure. However, what is not known a priori is whether this level of protection is more or less than the level provided for FRB-regulated banks.

If the performance requirements of the FDIC-regulated banks outweigh the monitoring requirements of the FRB-regulated banks in terms of protection (regulation intensity), then it is expected that nonmember state banks will exhibit the lowest failure rates during the extra-normal regulation period. That is,

> **Hypothesis 2b (H2b):** FDIC-regulated (nonmember state) banks will experience the lowest failure rates during the extra-normal regulation period (i.e., nonmember state bank < member state bank < national bank)

Failure During the Post-Regulation Period

The long-run implications of ineffective learning during the extra-normal regulation period will become apparent during the post-regulation period, when protective extra-normal regulations are eased (see Figure 1). Banks that were protected during the regulation period by stringent regulations and channeled into narrow range of "safe and sound" experiences may find that that their limited experience is a liability, rather than an asset as they move beyond the initial stages of their growth and development. Their deep

experience with only relatively low-risk activities may leave them ill equipped to adapt in their new less regulated competitive environment. In short, the library of potential survival-enhancing learning routines (Baum & Ingram, 1998; Kim et al., 2009; Kim & Miner, 2007) from which highly protected banks can draw is relatively limited.

Moreover, organizational routines honed during the extra-normal regulation period may no longer be appropriate or useful during the post-regulation era. New, reduced regulations, with which the firm has had no prior experience, must be responded to through search and exploration. New routines must be devised, and existing routines may need to be discarded or unlearned, which may require altering organizational features or redistributing organizational resources (Hedberg, 1981; Thornhill & Amit, 2003).

For example, during the post-regulation period, banks are permitted to reduce their equity capital levels to as low as 4%—a 100% decrease from the regulation period. FRB-regulated member state banks, the bank type that was required to maintain the absolute highest equity capital levels during the regulation period, may encounter more difficulty than the other bank types in comfortably reducing equity capital levels as reducing equity capital increases bank risk. Therefore, banks that experienced low levels of protection during the extra-normal regulation period may be able to harvest useful survival-enhancing learning routines and lower their rate of failure. Thus, it is expected,

> **Hypothesis 3 (H3):** OCC-regulated (national) banks will experience the lowest failure rates of the three bank types during the post-regulation period (i.e., national bank < nonmember state bank or member state bank).

As highlighted in the extra-normal regulation period hypotheses, whether FDIC-regulated nonmember state banks or FRB-regulated member state banks are afforded more protection depends on the relative stringency of the FDIC's performance requirements versus the FRB's monitoring requirements. If it is determined that the FRB regulations constrain the behavior of member state banks more than FDIC regulations constrain the behavior of nonmember state banks (i.e., lower failure rate for FRB-regulated banks than for FDIC-regulated banks during the extra-normal regulation period), then during the post-regulation period, it is expected that failure rate of FRB-regulated banks will rise and exceed that of FDIC-regulated banks (as well as that of OCC-regulated banks) as the limited repertoire of survival-enhancing learning routines accumulated during the regulation period becomes a liability. Therefore, it is expected,

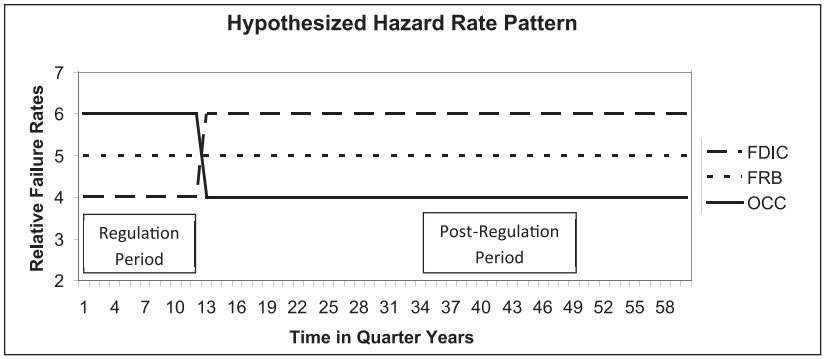

Figure 2. Hypothesized relative failure rates.
Note. FDIC = Federal Deposit Insurance Corporation; FRB = Federal Reserve Bank; OCC = Office of the Comptroller of the Currency.

Hypothesis 4a (H4a): FRB-regulated (member state) banks will experience the highest failure rates during the post-regulation period (i.e., member state bank > nonmember state bank > national bank)

However, if it is determined that the opposite is true and FDIC-regulated nonmember state banks are more protected (constrained) during the regulation period than FRB-regulated member state banks, then the following prediction is expected:

Hypothesis 4b (H4b): FDIC-regulated (nonmember state) banks will experience the highest failure rates during the post-regulation period (i.e., nonmember state bank > member state bank > national bank).

Taken together, these hypotheses collectively imply a "cross over" effect for bank failure rates (see Figure 2). Highly regulated banks during the extra-normal regulation period will initially experience low failure rates, but when regulations are eased after the third year of operations, failure rates will eventually rise. For more loosely regulated banks, just the opposite is expected to occur: Initially, failure rates will remain high, but after the regulations are eased, failure rates will decline.

It is also worth noting that the timing of this "cross over" effect might be sensitive to the specification of the post-regulation period. A post-regulation period that begins immediately after the expiration of the extra-normal regulations implicitly assumes "instant" learning. This assumption implies that new knowledge is rapidly absorbed and assimilated and is immediately

manifested in new observable behaviors without delay. Although reasonable, this may be a naïve assumption in the context of this study that uses organizational failure as the dependent variable. Argote (1999) argues that it is sometimes difficult to assess the performance implications of new knowledge because they may not manifest themselves for some time. Prior studies (e.g., Huselid & Becker, 1996; Olson & Schwab, 2000) have demonstrated such an effect. For example, Olson and Schwab (2000), in a study of managerial innovations in professional baseball, showed that there was a 4-year lag between the implementation of new practices and observable performance effects.

Method

Research Context: U.S. Commercial Banking Industry

We focus on the context of the U.S. commercial banking industry to investigate the effectiveness of direct government intervention, in the form of regulations, on curbing the liability of newness for new firms. This context represents an ideal setting for a number of reasons. First, the industry is characterized by sustained periods of concentrated bank chartering activity, resulting in a plethora of new firms for study. For instance, during the 15-year period of this study, more than 2,600 new banks were launched. Second, the results of prior studies set in this industry (e.g., DeYoung, 1999, 2000; Lee & Yom, 2014) have shown a consistent pattern of premature failure for new firms, suggesting that the forces of the liability of newness are quite strong in banking. For example, in a study of banks between the years of 1988 and 1994, DeYoung (1999) observed that the predicted probability of failure for new banks was more than double that of a comparable sample of similarly sized existing banks (19.65% vs. 8.93%).

Moreover, DeYoung (1999, 2000) argues that in addition to being financially fragile, new banks are more likely to fail because they (a) lack established relationships, (b) lack market recognition, and (c) have limited ability to attract "core" deposits—critical resources that are the lifeblood of banking organizations. These reasons are consistent with fundamental components of the liability of newness as identified by Stinchcombe: the lack of stable ties with stakeholders and the development of trust with customers. These resource deficiencies increase vulnerability and the likelihood of failure.

Finally, the U.S. commercial banking industry is a good context for this study because of the financial importance and visibility of the industry. According to the FDIC, there were 5,410 commercial banks in the United States as of September 30, 2015 (the most recently available data). These

banks held more than $14.7 trillion in assets and more than $9.8 trillion in U.S. bank deposits. This, combined with the fact that U.S. taxpayers are indirectly, if not directly, responsible for bailing out failed institutions, means that the industry is carefully monitored by many interested parties. Therefore, regulators have a strong incentive to implement regulations to help new banks successfully negotiate potential failure and the liability of newness.

Sample

The sample data consist of 2,682 new commercial banks chartered during the 15-year period from 1984 to 1998. Data from 61,353 quarterly observations are recorded. During the study period, 259 new banks failed, 905 new banks merged with other banks, and 1,560 new banks were still operating independently at the end of the study period (1998). It should be noted that this was a particularly perilous period for banks—on average, 178 banks failed each year, which actually exceeds the peak number of failures during the recent financial crisis (157 failures in 2010).

We use a cohort design for theory testing in this study. This design helps to guard against specification biases resulting from left-censored data on key control variables (Guo, 1993). Also, consistent with other banking-related research (e.g., Kim et al., 2009; Kim & Miner, 2007), we use data on *all* commercial banks during the study period to construct population-level variables.

We use archival financial and demographic data from *IDC Financial Publishing, Inc.* (IDC), a publisher of financial data on commercial banks, as a primary data source. IDC's ratings take into account the same criteria that federal bank examiners use when they determine a bank's composite performance evaluation with CAMEL (Capital adequacy, Asset quality, Management, Earnings, and Liquidity) rating at the conclusion of a bank examination.

The IDC data are supplemented with historical banking statistics taken from the FDIC's website (www.fdic.gov) and the *Directory of North American Financial Institutions*. These additional data provided information for the construction of key control variables.

Measures

Dependent variable

Organizational failure. Although failure may assume many forms, for the purposes of this study, a bank is presumed failed if one of the following three criteria is satisfied: (a) The bank is merged and/or liquidated at a loss, (b) the

bank is merged and/or liquidated involuntarily, or (c) the bank is merged with financial assistance from the FDIC. This measurement approach is consistent with other studies of bank failure (e.g., DeYoung, 1999, 2000; Kim et al., 2009; Kim & Miner, 2007). We measure failure by tracking changes in the unobserved hazard rate for failure ("failure rate") in a population. Intuitively, this approximates the probability of failure for a member of the population at any point in time, given that the member has survived up until that time.

Independent variables

Regulation intensity. New banks are subject to the regulations of their *primary federal regulator* (i.e., the FDIC, FRB, or OCC). A bank's primary federal regulator ultimately determines the set of regulations to which it must adhere. A new bank's primary federal regulator is set by its choice of bank charter type. The chief role of the primary federal regulator is to ensure that banks under its supervision operate in a "safe and sound" manner.

As described earlier, the regulations levied by the three federal bank regulatory agencies are *not* uniform. Therefore, regulator differences can lead to wide variation in the regulations by which new banks must abide. Hence, the unique regulatory environment of new banks implies that it is possible to develop reasonable proxies for the *relative* levels of protection (regulation) afforded to new banks, based on their bank charter class and primary federal regulator.

The relative level of regulation intensity associated with each federal regulatory agency was informed by archival documents (e.g., Code of Federal Regulations, Supervision and Regulation Letters of the Federal Reserve Board Letters, and the OCC's Comptroller's Handbook). The information obtained from these sources suggested a specific hierarchy of regulations. OCC regulations were viewed as more liberal (due to lower equity capital requirements, lower monitoring, and the absence of explicit profitability requirements), whereas FDIC regulations and FRB regulations were viewed as more stringent regulations (due to higher monitoring and specific profitability requirements). Thus, relatively speaking, OCC-regulated national banks are expected to be associated with *low* levels of regulation intensity and FRB-regulated member state banks and FDIC-regulated nonmember state banks are expected to be associated with *higher* levels of regulation intensity. A priori, it is not known whether FDIC-regulated or FRB-regulated state banks face the highest levels of regulation intensity. Competing hypotheses were developed to reflect this uncertainty.

Control variables. Our model for testing our hypotheses was informed by prior studies in organization theory and strategy (e.g., Baum & Ingram, 1998;

Hannan & Freeman, 1989; Kim et al., 2009; Kim & Miner, 2007), as well as empirical research on the banking industry (e.g., DeYoung, 1999, 2000; Lane, Looney, & Wansley, 1986). This led to four broad classes of control variables: (a) organization-level control variables, (b) environmental-level control variables, (c) population-level control variables, and (d) control variables to account for competing arguments.

Organization-level control variables. This set of variables is designed to control for potential sources of heterogeneity in bank characteristics that can affect performance. Five variables were included in our model to control for various aspects of bank performance: (a) *nonperforming loan ratio*, (b) *efficiency ratio*, (c) *earnings ratio*, (d) *liquidity ratio*, and (e) *composite performance rank*.

Nonperforming loan ratio (loans more than 90 days past due/total assets) is a measure of a bank's asset quality. All else equal, banks with fewer nonperforming loans (i.e., higher asset quality) should be less vulnerable to failure. *Efficiency ratio* (a bank's non-operating expenses/operating revenues) is generally regarded as a proxy for management quality and efficiency. Management inefficiency can increase the risk of bank failure (Lane et al., 1986; Wheelock & Wilson, 2000).

Earnings ratio (operating revenues/total assets or return on assets) is a measure of bank profitability. Banks with lower profitability may be more likely to fail (DeYoung, 2000; Lane et al., 1986). *Liquidity ratio* (total loans/total assets) is a measure of how easily assets can be converted into cash. Low liquidity indicates high risk, which, in turn, is linked to a higher likelihood of failure (Wheelock & Wilson, 1995, 2000). *Composite performance rank* is an overall measure of a bank's safety and soundness—its general risk of failure. It is computed using an index developed by *IDC Financial Publishing* that approximates the 5-point "CAMEL" ranking system used by federal regulators to rate banks on a continuum of performance from "sound in every respect" to "likely failure."

Other more general organizational features, such as age and size, have been acknowledged by several studies to affect organizational failure (e.g., Aldrich & Auster, 1986; DeYoung, 1999; Freeman, Carroll, & Hannan, 1983; Haveman, 1993; P. L. Ingram, 1993; Wheelock & Wilson, 1995). These variables (*age* and *size*), as well as the variable age^2, which accounts for a curvilinear relationship between age and failure (Bruderl & Schussler, 1990; Kim & Miner, 2007), have been included in our model to account for these effects.

Environment-level control variables. Economic conditions, such as a recession, can have a significant impact on an organization's life chances. The

unemployment rate (*unemployment*) and the level of personal income (*personal income*) are two widely followed economic indicators that have been found to influence failure in other banking studies (Kim & Miner, 2007; Whalen, 1991). We also include the bank prime rate (*prime rate*) in our model as a proxy for interest rates, an important driver of bank earnings, and thus of bank survival (Kim & Miner, 2007). The commercial real-estate market is an environmental factor acknowledged by banking industry studies to affect bank failure rates (Hanc, 1997; Kim & Miner, 2007; Whalen, 1991). Two variables, *NCREIF* (an index from the National Council of Real Estate Investment Fiduciaries that captures investment returns on commercial real-estate properties) and *nonresidential construction* (the total number of commercial construction permits issued) are included in our model to control for the potential effect of the commercial real-estate market on bank failures.

The level of competition from other financial institutions is another critical factor that may affect a bank's life chances. In studies of organizational failure, competition is generally viewed as a function of density—the number organizations in a particular population (Hannan & Carroll, 1992). We have included variables to account for different measures of bank density. These include *bank density*, *bank density*^{2} (to account for potential curvilinear effects; Hannan & Freeman, 1989; Kim & Miner, 2007), and *bank founding density* (to account for the competitive pressures of contemporaneous density at the time of founding; Hannan & Freeman, 1989; Kim & Miner, 2007).

Population-level control variables. Huber (1991) and P. Ingram and Baum (1997) have pointed out that it is possible for new entrants to learn from the collective experience of existing participants prior to their own entry into an industry—a phenomenon dubbed "congenital" learning. To account for this possibility, control variables for congenital operating and congenital failure experience were included in our model.

Congenital operating experience is measured by taking the (discounted) sum of the total loans of all commercial banks, up to 1 year before the founding of the focal bank (Kim & Miner, 2007). *Congenital failure experience* takes into account the (discounted) sum of the total number of commercial bank failures up to 1 year before the founding of the focal bank (Kim & Miner, 2007). These variables are discounted to reflect the possibility of knowledge depreciation over time (Baum & Ingram, 1998; Darr, Argote, & Epple, 1995; P. Ingram & Baum, 1997).

Kim and Miner (2007) suggest that failure, as well as "near-failure" (at least two consecutive quarters of poor performance followed by a rebound in performance), in a focal industry can result in learning for other industry

members. To control for this possibility, variables representing the failure and near failure of commercial banks (*bank failure* and *bank near failure*) were included in our model. These variables were computed by taking the (discounted) sum of the total number of commercial bank failures and near failures subsequent to the founding of the focal bank.

Competing arguments. We include two variables to guard against competing explanations for the effect of prior failure on subsequent failure. These variables, *bank deposit release* (aggregated deposits of failed banks) and *bank employee release* (aggregated number of employees of failed banks), account for the potential effect of increased resources from failed banks on the subsequent survival prospects of the remaining banks (Burgelman, 1994; Carroll & Delacroix, 1982). Another variable, *bank mass density* (total assets of all commercial banks aggregated at the state level), controls for the effect of the prior failure of weaker competitors on the survival prospects of the remaining banks (Barnett & Amburgey, 1990; Baum & Mezias, 1992; Kim & Miner, 2007).

Analysis

The hypotheses described earlier were tested using event history analysis. The event history methodology allows one to examine failure by making use of the information provided by cases in the sample that have not yet failed (i.e., right-censored; Allison, 1984). The "hazard" (failure) rate represents the instantaneous probability that an event ends in the interval ($t,\ t + \Delta t$), given that the event has not occurred prior to the beginning of the interval. The hazard rate can be expressed as follows:

$$h(t) = \lim_{\Delta t \to 0} P\left(t + \Delta t > T \geq t \mid T \geq t / \Delta t\right).$$

In estimating our initial model, we use a constant rate exponential model specification. This model specification makes no assumption about age dependence in the empirical relationship between regulation intensity and bank failure. Instead, we control for age dependency by including age-related covariates (i.e., age and age^2) in the overall model. This model choice is consistent with prior work (Baum & Ingram, 1998; Berta, 2000; Kim & Miner, 2007) that has included considerations of aging on failure. The exponential model takes the following form:

$$h(t) = \exp\left(\beta_0 + \beta_k' X_i\right),$$

where β_0 represents a constant term, while $\beta_k'X_i$ represents a matrix of coefficients for the k covariates. When all of the covariates are set to zero, the hazard rate is a constant. All of the "movement" of the hazard rate comes from the covariates (Box-Steffensmeier & Jones, 1997). The exponential model is estimated using maximum likelihood methods, a principle that chooses coefficient estimates that maximize the probability of observing what has, in fact, been observed (Allison, 1984).

Results

Descriptive Statistics

The original sample included 2,724 commercial banks that were chartered between January of 1984 and December of 1998. Of this sample, 42 banks were dropped because of incomplete information. This yielded a final sample of 2,682 commercial banks and a total of 61,353 observations (spells or organization quarters). Summary statistics and a correlation matrix of all of the variables included in the study can be found in Table 2.

Model Estimation

Model I (Table 3) allows for direct testing of our main hypotheses using the beginning of the fourth year of bank operations as the specification of the post-regulation period. In Panel A (Table 3), *FDIC ≤ 3 YRS* is treated as the omitted category. Thus, coefficient estimates for all other types of banks in different time periods are compared with *FDIC ≤ 3 YRS*. Panel B captures the coefficient estimates when *FRB ≤ 3 YRS* is treated as the omitted category.

Panel A shows that failure rate of FDIC-regulated nonmember state banks (proxy for higher levels of regulation) is significantly lower than other types of banks during the extra-normal regulation period. That is, the coefficients of both *FRB ≤ 3 YRS* and *OCC ≤ 3 YRS* are positive and statistically significant. Panel B (*FRB ≤ 3 YRS* as the omitted category) shows that FDIC-regulated nonmember state banks have a lower likelihood of failure during the extra-normal regulation period, but shows no statistically significant difference between FRB-regulated member state banks and OCC-regulated national banks. Therefore, Hypothesis H1 is only partially supported (the failure rate of OCC-regulated banks exceeds that of FDIC-regulated banks, but not that of FRB-regulated banks). Hypothesis H2b, which predicted that FDIC-regulated nonmember state banks would experience the lowest failure rates, rather than Hypothesis H2a, which predicted that FRB-regulated member state banks would experience the lowest failure rates, is fully supported.

Table 2. Correlation Matrix.

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1 Calendar time	104.16	46.62																													
2 Nonperforming loans	0.01	0.01	.07																												
3 Efficiency ratio	0.94	3.79	−.04	.03																											
4 Earnings ratio	0.00	0.20	.02	−.02	−.02																										
5 Liquidity ratio	0.56	0.25	.12	.34	.08	−.03																									
6 Composite performance	152.01	71.37	.36	−.13	−.09	.01	−.07																								
7 Age	58.40	42.15	.60	.12	−.08	.01	.21	.17																							
8 Age^2	5,186.81	6,306.91	.58	.07	−.06	.00	.13	.20	.95																						
9 Bank size (log)	10.64	1.21	.40	.17	−.09	.01	.27	.22	.35	.32																					
10 Unemployment	5.94	1.59	−.39	.02	.01	−.01	−.02	−.28	−.14	−.17	−.14																				
11 Personal income	20.14	4.32	.79	.08	−.03	.01	.11	.26	.47	.45	.39	−.35																			
12 Prime rate	8.42	1.45	−.35	−.07	.03	−.01	−.09	−.10	−.25	−.18	−.17	−.21	−.25																		
13 NCREIF	1.46	1.80	.29	−.07	.00	.01	−.03	.22	.15	.23	.08	−.38	.26	.29																	
14 Nonresidential construction	131.36	16.23	−.24	−.09	.03	−.01	−.08	−.03	−.22	−.11	−.15	−.26	−.16	.73	.45																
15 Bank density	469.24	451.63	−.37	−.04	.02	−.02	−.06	−.26	−.14	−.12	−.23	.35	−.38	.12	−.11	.15															
16 Bank density^2	424.15	829.58	−.39	−.02	.03	−.02	−.04	−.25	−.18	−.16	−.21	.35	−.38	.13	−.09	.18	.95														
17 Bank mass density	13,953.01	15,497.25	.09	.00	.00	.00	−.01	.01	.13	.13	.14	.21	.30	−.02	.05	.00	.17	.14													
18 Bank founding density	578.75	590.41	−.22	−.03	.00	−.01	−.05	−.21	.05	.05	−.17	.29	−.27	.07	−.08	.08	.93	.83	.17												
19 Bank deposit release	1,126.72	4,468.09	−.14	.07	.00	−.01	−.01	−.21	−.03	−.07	−.05	.16	−.16	.16	−.09	.08	.34	.28	.05	.42											
20 Bank employee release	643.75	1,948.90	−.13	.07	−.01	−.01	−.01	−.21	.01	−.05	−.04	.21	−.15	.08	−.14	−.01	.38	.29	.07	.48	.91										
21 Bank failure (disc & log)	4.11	1.75	−.30	0.13	−.09	.02	.25	−.24	.16	.01	.07	.25	−.24	−.08	−.42	−.25	.08	.04	−.01	.11	.19	.23									
22 Bank near failure (disc & log)	6.58	2.09	.15	.15	−.12	.04	.35	−.05	.40	.24	.26	.05	.12	−.22	−.15	−.22	.04	−.08	.03	.03	.08	.11	.81								
23 Congenital failure experience	163.73	99.97	.21	.01	−.02	.01	.03	.14	−.08	−.15	.13	−.06	.21	−.15	−.13	−.26	−.25	−.23	−.02	−.24	−.08	−.08	.03	.05							
24 Congenital operating experience	2,577.80	536.07	.53	−.04	.03	.01	−.08	.24	−.34	−.32	.07	−.30	.43	−.16	.16	−.06	−.30	−.27	−.03	−.31	−.13	−.15	−.51	−.25	.42						
25 FDIC ≤ 3 Yrs	0.18	0.38	−.14	−.11	.03	−.02	−.15	.05	−.45	−.35	−.19	−.06	−.10	.11	.03	.15	−.08	−.06	−.08	−.13	−.06	−.09	−.22	−.27	.04	.31					
26 FDIC > 3 Yrs	0.27	0.45	.29	.06	−.04	.00	.13	.13	.34	.25	.18	−.10	.25	−.16	.01	−.19	−.18	−.17	.00	−.15	−.06	.06	.10	.20	.17	−.01	−.28				
27 FRB ≤ 3 Yrs	0.06	0.23	−.18	−.07	.02	−.01	−.07	−.02	−.23	−.18	−.11	.01	−.13	.09	.00	.11	.02	.02	−.02	−.02	−.03	−.04	−.06	−.12	.00	.04	−.11	−.15			
28 FRB > 3 Yrs	0.11	0.31	.12	.02	−.02	.00	.06	−.01	.22	.18	.11	−.01	.12	−.07	−.02	−.10	−.06	−.07	.05	−.03	.00	.01	.09	.12	.00	−.08	−.16	−.21	−.08		
29 OCC ≤ 3 Yrs	0.15	0.36	−.34	−.06	.05	.02	−.11	−.10	−.41	−.32	−.20	.13	−.28	.14	.00	.21	.25	.30	−.02	.13	−.03	−.05	−.15	−.23	−.10	.02	−.19	−.26	−.10	−.15	
30 OCC > 3 Yrs	0.24	0.43	.12	.11	−.03	.02	.09	−.09	.35	.29	.13	.05	.05	−.04	−.03	−.10	.09	.03	.05	.20	.16	.19	.18	.20	−.13	−.24	−.26	−.34	−.14	−.19	−.24

Note. FDIC = Federal Deposit Insurance Corporation; FRB = Federal Reserve Bank; OCC = Office of the Comptroller of the Currency; NCREIF = National Council of Real Estate Investment Fiduciaries.

Table 3. Baseline and Initial Post-Regulation Period Specification.

	Baseline		Model I		Model I		Model I		Model I	
	Model		Panel A		Panel B		Panel C		Panel D	
Variables	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Calendar Time	0.073***	0.01	0.071***	0.01	0.071***	0.01	0.071***	0.01	0.071***	0.01
Nonperforming Loans	11.660***	1.48	11.784***	1.51	11.784***	1.51	11.784***	1.51	11.784***	1.51
Efficiency Ratio	0.003	0.01	0.003	0.01	0.003	0.01	0.003	0.01	0.003	0.01
Earnings Ratio	-3.183***	0.44	-3.410***	0.47	-3.410***	0.47	-3.410***	0.47	-3.410***	0.47
Liquidity Ratio	2.603***	0.21	2.631***	0.22	2.631***	0.22	2.631***	0.22	2.631***	0.22
Composite Performance	-0.026***	0.00	-0.025***	0.00	-0.025***	0.00	-0.025***	0.00	-0.025***	0.00
Age	-0.049**	0.02	-0.069***	0.02	-0.069***	0.02	-0.069***	0.02	-0.069***	0.02
Age2	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank Size	-0.268***	0.08	-0.288***	0.08	-0.288***	0.08	-0.288***	0.08	-0.288***	0.08
Unemployment	0.133**	0.06	0.130**	0.06	0.130**	0.06	0.130**	0.06	0.130**	0.06
Personal Income	0.050	0.03	0.044	0.03	0.044	0.03	0.044	0.03	0.044	0.03
Prime Rate	-0.250**	0.10	-0.248**	0.10	-0.248**	0.10	-0.248**	0.10	-0.248**	0.10
NCREIF	0.002	0.05	-0.004	0.05	-0.004	0.05	-0.004	0.05	-0.004	0.05
Non Res Construction	-0.001	0.01	-0.001	0.01	-0.001	0.01	-0.001	0.01	-0.001	0.01
Bank Density	0.001	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank Density2	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank Mass Density	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank Founding Density	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank Deposit Release	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00

(continued)

Table 3. (continued)

	Baseline		Model I		Model I		Model I		Model I	
	Model		Panel A		Panel B		Panel C		Panel D	
Variables	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE	Coeff	SE
Bank Employee Release	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank Failure	1.685***	0.32	1.665***	0.33	1.665***	0.33	1.665***	0.33	1.665***	0.33
Bank Near Failure	-1.335***	0.22	-1.288***	0.23	-1.288***	0.23	-1.288***	0.23	-1.288***	0.23
Congenital Failure Experience	-0.001	0.00	-0.001	0.00	-0.001	0.00	-0.001	0.00	-0.001	0.00
Congenital Operating Experience	-0.004***	0.00	-0.004***	0.00	-0.004***	0.00	-0.004***	0.00	-0.004***	0.00
FDIC < 3 Yrs					-1.355***	0.53	-1.630***	0.50	-1.680***	0.50
FRB < 3 Yrs			1.355***	0.53			-0.275	0.44	-0.325	0.45
OCC < 3 Yrs			1.587***	0.43	0.231	0.38	-0.043	0.32	-0.094	0.34
FDIC > 3 Yrs			1.681***	0.50	0.325	0.45	0.051	0.20		
FRB > 3 Yrs			1.634***	0.52	0.279	0.47	0.004	0.24	-0.047	0.25
OCC > 3 Yrs			1.630***	0.50	0.275	0.44			-0.051	0.20
Constant	4.210	2.49	2.823	2.50	4.179	2.51	4.179	2.51	4.179	2.51
Log Likelihood	-358.115		-347.9		-347.9		-347.9		-347.9	

Note. FDIC = Federal Deposit Insurance Corporation; FRB = Federal Reserve Bank; OCC = Office of the Comptroller of the Currency. NCREIF = National Council of Real Estate Investment Fiduciaries.
**$p < .05$. ***$p < .01$.

Panels C and D (Table 3) examine differences in failure rates across bank types during the post-regulation period where the post-regulation period begins with the fourth year of bank operations. With this post-regulation period specification, none of the failure rate comparisons was statistically significant. Thus, neither Hypothesis H3 nor Hypotheses H4a or H4b are supported under this specification of the post-regulation period.

Alternative Specification of the Post-Regulation Period

Earlier, we argued that using the fourth year (and beyond) of bank operations specification of the post-regulation period invokes an implicit assumption of instant learning. This assumption implies that new knowledge is rapidly absorbed and assimilated and immediately manifested in observable new behaviors without delay. Moreover, we speculated that the pace with which new knowledge is assimilated and learning benefits are harvested can be considered an open question and may depend on a number of different factors. This points to additional analysis that considers a delay or lag period between the end of the regulation period and the manifestation of learning during the post-regulation period.

The notion of a delay, lag, or "adjustment" period prior to reaping the benefits of learning has been established in other learning-related studies (Argote, Beckman, & Epple, 1990; Denrell, Fang, & Levinthal, 2002; Olson & Schwab, 2000). Olson and Schwab (2000), for instance, showed a 4-year lag between the implementation of new practices and observable performance effects in a study of managerial innovations in professional baseball. The consideration of these studies and other factors, including archival banking documents, suggested that a 4-year lag period might be appropriate. This treatment allows for sufficient time to pass so that the benefits of important learning lessons can be fully harvested.

Model II: Alternative Specification of the Post-Regulation Period Results

Table 4 shows the maximum likelihood estimates for a new model, Model II, that compares failure rates during the extra-normal regulation period with those during an "adjustment" period (4 years of bank operations after the extra-normal period) and a new post-regulation "learning manifestation" period (beyond the adjustment period of new bank operations) that allows for a 4-year lag.

The results from this model (Panel AA) show that during the extra-normal regulation period, the same pattern regarding the relative rates of failure

Table 4. Alternative Post-Regulation Period Specification.

	Model II		Model II		Model II		Model II	
	Panel AA		Panel BB		Panel CC		Panel DD	
Variables	Coefficient	*SE*	Coefficient	*SE*	Coefficient	*SE*	Coefficient	*SE*
Calendar time	0.069***	0.01	0.069***	0.01	0.069***	0.01	0.069***	0.01
Nonperforming loans	11.966***	1.53	11.966***	1.53	11.966***	1.53	11.966***	1.53
Efficiency ratio	0.003	0.01	0.003	0.01	0.003	0.01	0.003	0.01
Earnings ratio	−3.311***	0.50	−3.311***	0.50	−3.311***	0.50	−3.311***	0.50
Liquidity ratio	2.653***	0.21	2.653***	0.21	2.653***	0.21	2.653***	0.21
Composite performance	−0.025***	0.00	−0.025***	0.00	−0.025***	0.00	−0.025***	0.00
Age	−0.083***	0.02	−0.083***	0.02	−0.083***	0.02	−0.083***	0.02
Age^2	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank size	−0.302***	0.08	−0.302***	0.08	−0.302***	0.08	−0.302***	0.08
Unemployment	0.127**	0.06	0.127**	0.06	0.127**	0.06	0.127**	0.06
Personal income	0.041	0.03	0.041	0.03	0.041	0.03	0.041	0.03
Prime rate	−0.261**	0.10	−0.261**	0.10	−0.261**	0.10	−0.261**	0.10
NCREIF	−0.006	0.05	−0.006	0.05	−0.006	0.05	−0.006	0.05
Nonresidential construction	−0.003	0.01	−0.003	0.01	−0.003	0.01	−0.003	0.01
Bank density	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank $density^2$	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank mass density	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank founding density	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank deposit release	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00
Bank employee release	0.000	0.00	0.000	0.00	0.000	0.00	0.000	0.00

(continued)

Table 4. (continued)

	Model II		Model II		Model II		Model II	
	Panel AA		Panel BB		Panel CC		Panel DD	
Variables	Coefficient	*SE*	Coefficient	*SE*	Coefficient	*SE*	Coefficient	*SE*
Bank failure	1.711***	0.33	1.711***	0.33	1.711***	0.33	1.711***	0.33
Bank near failure	−1.293***	0.23	−1.293***	0.23	−1.293***	0.23	−1.293***	0.23
Congenital failure experience	−0.002	0.00	−0.002	0.00	−0.002	0.00	−0.002	0.00
Congenital operating experience	−0.004***	0.00	−0.004***	0.00	−0.004***	0.00	−0.004***	0.00
FDIC ≤ 3 Yrs			−1.601***		−1.668**	0.66	−1.065	0.83
FRB ≤ 3 Yrs	1.356***	0.52	−0.245	0.52	−0.312	0.62	0.291	0.79
OCC ≤ 3 Yrs	1.602***	0.43			−0.066	0.54	0.536	0.74
FDIC 4-7 Yrs	1.611***	0.51	0.010	0.51	−0.056	0.46	0.546	0.68
FRB 4-7 Yrs	1.643***	0.52	0.041	0.52	−0.025	0.49	0.578	0.69
OCC 4-7 Yrs	1.724***	0.50	0.122	0.50	0.056	0.46	0.659	0.68
FDIC > 7 Yrs	1.668**	0.66	0.066	0.66			0.603	0.66
FRB > 7 Yrs	1.065	0.83	−0.536	0.83	−0.603	0.66		
OCC > 7 Yrs	0.192	0.75	−1.410**	0.75	−1.476***	0.57	−0.873	0.75
Constant	3.510	2.51	5.112	2.07	5.178		4.576	2.58
Log likelihood	−342.8		−342.8		−342.8		−342.8	

Note. FDIC = Federal Deposit Insurance Corporation; FRB = Federal Reserve Bank; OCC = Office of the Comptroller of the Currency; NCREIF = National Council of Real Estate Investment Fiduciaries.
**$p < .05$. ***$p < .01$.

among the different bank types holds (as these variables are unchanged from Model I). During the new post-regulation "learning manifestation" period, however, FDIC-regulated nonmember state banks (proxy for higher levels of regulation) now fail at a rate that is significantly higher than of OCC-regulated national banks (as shown in Panel CC); the coefficient of *OCC > 7 YRS* is both negative and statistically significant when compared with *FDIC > 7 YRS*, the omitted category. A comparison of OCC-regulated national banks and FRB-regulated member state banks during the new post-regulation period (*OCC > 7 YRS* vs. *FRB > 7 YRS*) in Panel DD shows that there is no statistically significant difference between the two.

Furthermore, in Panel AA (Table 4), when the *intra*bank failure rate of FDIC-regulated nonmember state banks is assessed by comparing the extra-normal regulation period and the new post-regulation period (i.e., *FDIC ≤ 3 YRS* vs. *FDIC > 7 YRS*), the failure rate of FDIC-regulated nonmember state banks (proxy for higher levels of regulation) increases significantly (indicated by the positive coefficient of *FDIC > 7 YRS*). Conversely, in Panel BB of Table 4, when the *intra*bank failure rate of OCC-regulated national banks is assessed by comparing the extra-normal regulation period and the new post-regulation period (i.e., *OCC ≤ 3 YRS* vs. *OCC > 7 YRS*), the failure rate of OCC-regulated national banks (proxy for lower levels of regulation) declines significantly (indicated by the negative coefficient of *OCC > 7 YRS*). This pattern is consistent with our previously hypothesized underlying theoretical processes.

Therefore, under this alternative specification of the post-regulation period, the pattern of results is largely consistent with the theorized effects during the post-regulation period. A "cross-over" effect is observed for the highest failing and lowest failing bank types from the extra-normal regulation period to the post-regulation period. This cross-over effect is illustrated in Figure 3.

Thus, Hypothesis H3, which predicted that OCC-regulated national banks would experience the lowest failure rates during the post-regulation period, is fully supported for one contrast (i.e., OCC- vs. FDIC-regulated banks) but is unsupported for the second contrast (OCC- vs. FRB-regulated banks). Although the failure rate of OCC-regulated national banks is lower than both FDIC-regulated nonmember state banks and FRB-regulated member state banks during the regulation period, only the difference between OCC-regulated national banks and FDIC-regulated nonmember state banks is statistically significant.

Hypothesis H4b, which predicted that FDIC-regulated nonmember state banks would experience the highest failure rates during the post-regulation period, is also fully supported for one contrast (i.e., FDIC- vs. OCC-regulated

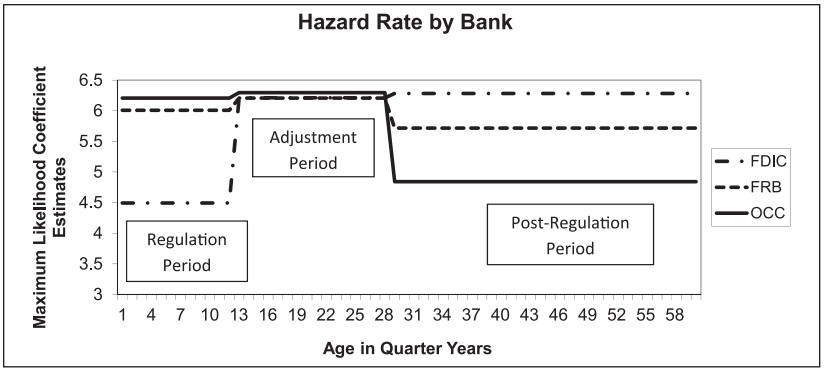

Figure 3. Hazard rate estimates by bank type.
Note. FDIC = Federal Deposit Insurance Corporation; FRB = Federal Reserve Bank; OCC = Office of the Comptroller of the Currency.

banks) and unsupported for the second contrast (FDIC vs. FRB). In other words, the failure rate of FDIC-regulated nonmember state banks is higher than both FRB-regulated member state banks and OCC-regulated national banks, but only the difference between FDIC-regulated nonmember state banks and OCC-regulated national banks is statistically significant.

Discussion

Our results have important implications for both liability of newness theory and public policy. Despite the passage of more than five decades, Stinchcombe's (1965) liability of newness phenomenon remains robust, and our study offers no evidence to repudiate this claim. It appears that the organizing challenges Stinchcombe (1965) outlined more than 50 years ago are still a necessary stage of development that all new firms must navigate on the path to maturity. However, public policy regulations designed to protect new firms from the adverse impact of the early developmental stages of an organization do not eliminate these challenges, but merely delay their impact. Therefore, our research extends Stinchcombe's (1965) work on the liability of newness literature by identifying regulations as an additional external factor that can exacerbate the challenges new firms face.

We began this article by arguing that government policy makers are among some of the important actors who have embraced the widely held view that new firms are susceptible to internal and external forces that can derail a new firm's journey from a fledgling organization to a viable going concern. This

logic is embedded in federal regulations that govern new banking firms in the United States, as new banks are subject to stricter extra-normal regulations (compared with existing banks) for a period after their initial founding. These stricter, time-dependent regulations are intended to limit the new bank to a set of safe and sound practices during a time when they are financially fragile (DeYoung, 1999). In addition, because different bank charter types lead to supervision by different bank regulators, each with its own set of rules, there is variation in the stringency of the regulations in which new banks are subject to during the period of extra-normal regulations.

We find that new banks subject to the strictest set of regulations during the extra-normal regulation period (i.e., FDIC banks) are initially *less* likely to fail than those subject to the loosest set of regulations (i.e., OCC banks) during the same period. These strict regulations curb discretion and necessarily constrain the strategic choices of banks. Thus, to the degree that these regulations effectively eliminate risky choice sets for new banks, failure will be reduced. In fact, if we view these regulations as form of standardized controls, then this idea appears consistent with Stinchcombe's (1965) initial solution of implementing "standard social routines" to reduce the liability of newness (p. 149).

However, during the post-regulation period (after the extra-normal regulations expire), we find that the banks that were initially subject to the strictest regulations during the extra-normal regulation period (i.e., FDIC banks) are now *more* likely to fail than those subject to the loosest set of regulations (i.e., OCC banks). Moreover, during the post-regulation period, we find that the failure rate for FDIC banks (those subject to the strictest regulations) is actually *higher* than it was during the extra-normal regulation period. Therefore, although strict regulations during the extra-normal regulatory period decrease the failure rate of new firms in the short run, the removal of those same strict regulations increases failure rates in the long run. As a result of the key differences in the stringency and application of these extra-normal regulations, we conclude that new firms have different organizational learning capabilities as they move out of their critical early years as seen by the fact that some new banks adapt to their new environment more effectively than others. This too is consistent with Stinchcombe; he argues that developing social routines for letting managers exercise a degree of initiative ("the sense of responsibility for getting the job done rather than doing as they are told") is more important than implementing standard social routines and "greatly reduces the liability of newness" (Stinchcombe, 1965, p. 149).

Taken together, stricter regulations appear to have the anticipated effect of attenuating failure initially during the extra-normal regulation period but the unanticipated effect of actually increasing failure in the post-regulation

period. So much so that the elevated likelihood of failure for strictly regulated (FDIC) banks in the long run is significantly higher than that of the more loosely regulated (OCC) banks. This counterintuitive finding is an unintended consequence of the extra-normal regulations; a policy intervention that was designed to buffer new firms from failure may in fact exacerbate the conditions that contribute to the liability of newness and make the new firms more vulnerable to failure in the long run. Moreover, as Stinchcombe (1965) does not specifically consider the impact of regulations, our research contributes to the liability of newness literature by identifying an additional external factor that contributes to the perils that new firms face. We suggest that by constraining the strategic options available to an organization, external regulations limit the development of important organizational routines that might prove beneficial in reducing the liability of newness.

Placing the results of this work in the context of other banking studies, particularly Leary and DeVaughn (2009) who studied the determinants of a successful new bank launch, we find a consistent thread regarding regulation. Similar to this study, Leary and DeVaughn (2009) showed that banks that attempted to launch under conditions of high regulation (by choosing a single bank holding company structure) were unsuccessful compared with banks that chose a different, less regulated organizational form, again, calling into question the value of stricter regulations for nascent and new firms.

This begs the larger question of whether policy interventions, either indirect (e.g., sponsorship programs) or direct (e.g., regulations), as we examine here, are useful at all in mitigating the liability of newness. Although Amezcua, Grimes, Bradley, and Wiklund (2013) take a contingent view on the effectiveness of such interventions (finding that university-sponsored business incubators were effective in reducing failure rates only under certain conditions), based on our results, we are inclined to take a more pessimistic view, even suggesting that in some circumstances, such interventions may actually be harmful.

Public Policy Implications

Because new banks achieve remarkably different outcomes during the post-regulation period and these differences appear to be correlated with the level of the regulations levied by federal bank regulators, perhaps federal regulators should revisit extra-normal new bank regulations. Overall, the differences in the intensity of regulations from federal bank regulator to federal bank regulator can create disparities in learning capacities and ultimately affect the survival odds of the different types of banks. Thus, from a policy standpoint, one way to limit the number of bank failures may be to reduce the

variation in regulations from agency to agency. Although the Federal Financial Institutions Examination Council (FFIEC) was founded in large part to "make recommendations to promote uniformity in the supervision of financial institutions," clearly, uniformity across the various regulatory agencies is still a work in progress.

From a practical perspective, public policy makers face a dilemma: They can either stand idle while new firms bear the full brunt of market forces, acknowledging that some nontrivial number of them will fail in their early years or they can take action by adopting regulations that try to buffer and protect new firms from failure, even though such attempts are often futile. In high-profile and important industries in which the public is a significant stakeholder, neither alternative may be politically palatable given the public's aversion for bank failures and bail outs. However, new firms that are market-tested stand the best chance of long-run success, as any benefit from protection-oriented regulation is likely to be ephemeral. This is an uncomfortable truth that policy makers and the public alike may need to endure.

Limitations and Future Research

One potential threat to the internal validity of this study is selection. The selection threat arises due to the fact that new banks do not randomly select a bank charter class (i.e., nonmember state bank, member state bank, or national bank) when they initially organize. This could pose a problem as we argue that bank charter class can be viewed as a proxy for specific levels of regulation. Therefore, if a bank can purposefully select its bank charter and thus affect its level of regulation, it might be able to deterministically influence its survival chances by selecting the optimal bank charter class at its inception. In addition, the bank charter class could be serving as a proxy for other key causal variables in our model and its effect could be due to those variables rather than the degree of protection involved.

While the line of reasoning concerning the optimal charter class is plausible, it is probably unlikely. First, to "game the system," a new bank would have to invest in an enormous amount of careful research and ongoing monitoring to keep track of each bank failure by charter class and then infer the optimal bank charter class for its long-term success. This would be an extremely burdensome task, especially in light of the operational challenges that a new bank is likely to encounter in its fledgling state. Moreover, as Miner, Kim, Holzinger, and Haunschild (1999) state, "to gain information on failures in many other organizations would impose unrealistic information gathering and processing demands, especially given the difficulty organizations have in learning from their own experience" (p. 210).

In addition, given the complex temporal relationship between bank charter class and failure, gaming the system would seem even more unlikely. As we find, the bank charter class that reduces the risk of failure in the short term may in fact increase the risk of failure in the long term, creating more uncertainty regarding the optimal bank charter class. Moreover, if minimizing the level of regulation were the most important reason for selecting a specific bank charter class, one would expect most banks to opt for the charter class than poses the least burdensome regulatory environment, in this case, a national bank charter. However, based on historical data of new bank charters, this does not hold—from 1935 to 1998, only 37% of new charters were national bank charters (Lovett, 2001).

A final limitation of our study is that we focus on a single, highly regulated industry. However, several industries in the United States share a similar regulated context, including pharmaceuticals, medical devices, transportation, consumer products, and other financial services (such as insurance) where our findings might also be relevant. Moreover, we suggest that our results could be generalizable to other contexts where firms transition from protected into unprotected markets. For example, in international trade, governments may choose to protect their "infant industries" by erecting trade barriers so that these industries are shielded from the true dynamics of competition and afforded the time to develop and grow prior to competing globally. Given the strong parallels to our study context, our results should inform country trade managers of the risks associated with such policies. Our results should give pause to such policies.

Although we argue that stringent regulations placed on new firms contribute to the liability of newness by undermining the acquisition and development of adaptive organizational routines for future use, we do not specify distinct, internal practices that are likely to increase a firm's survival odds. Future research should investigate typical new firm strategies to determine if a set of such practices can be reliably identified. For example, both DeYoung (2000) and Lee and Yom (2014) point out that new banks typically fail because of an accumulation of nonperforming (bad) loans. However, how and why these loans become nonperforming is unclear; research that focuses on the precise internal policies that lead to such an outcome would improve our understanding of the process and be of great value.

Conclusion

Although public policy makers realize that liability of newness exists, policy interventions such as restrictive extra-normal regulations, designed to buffer, fragile, fledgling new banks from failure in the short run, may in fact, be

more harmful than helpful in the long run by impairing the banks' opportunity to learn in the short term and its capacity to adapt in the long term. This might be a cautionary tale that interventions, whether they be public policies, new technologies, or new business practices, are still not enough to overcome the persistent power of the liability of newness.

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