THE POLITICAL ECONOMY OF DEREGULATION: EVIDENCE FROM THE RELAXATION OF BANK BRANCHING RESTRICTIONS IN THE UNITED STATES

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IN THE UNITED STATES*

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Abstract

This paper provides a positive political economy analysis of deregulation, focusing on the recent removal of barriers to bank branching. Intra- and inter- state branching restrictions had been in place in most states for more than a century but have largely disappeared during the last 25 years. Branching restrictions primarily benefit small and inefficient banks against competition from large and efficient banks. Competing financial institutions not subject to the branching laws also benefit from restrictions on their rivals. Consumer and small businesses, however, tend to be harmed by regulations that reduce banking competition.

To explain the shift to deregulation, we argue that a recent series of technological and financial innovations caused a change in the long-standing political equilibrium by eroding the value of the restrictions to the beneficiaries. The development and proliferation of the Automated Teller Machine from the 1970s on, for example, have reduced the protection that branching restrictions provided small banks. We then use proxies for the relative strength of the potential winners and losers from branching restrictions to explain the pattern and timing of the deregulation across the states.

Our results support the political economy hypothesis. First, states in which there are relatively more small banks are more likely to delay the relaxation of the branching restrictions. Second, states in which the small banks are performing poorly relative to the larger banks are more likely to deregulate earlier. Third, in states where banks can sell insurance, the larger is the insurance industry relative to the banking industry, the later is the deregulation. Fourth, states with relatively more small firms are more likely to achieve deregulation earlier. In addition, we analyze voting on the federal deregulation of interstate bank branching in the House and find that the same factors explain the voting behavior of the Representatives. We conclude by drawing lessons about the future path of financial deregulation and the forces driving deregulation more generally.

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I. Introduction

One of the key challenges to the economic theory of regulation has been to develop convincing explanations not only of the origins of regulation but also of deregulation (e.g., Peltzman 1989). The economic theory, also called the private interest theory, characterizes the regulatory process as one of interest group competition in which compact, well-organized groups are able to use the coercive power of the state to capture rents for those groups at the expense of more dispersed groups (e.g., Stigler 1971, Peltzman 1976, and Becker 1983). This approach contrasts with the public-interest approach to regulation in which government intervention corrects market failures and maximizes social welfare.[1]

While these theories are not necessarily mutually exclusive nor exhaustive (see Noll 1989), they do have different implications for regulatory entry and exit. The economic theory has been notably successful in explaining a wide-variety of regulatory interventions that are extremely difficult to rationalize on public interest grounds (see Stigler 1988). The economic theory, however, has had little success in explaining the recent wave of deregulation, which has eliminated many of inefficient, rent-creating regulations and appears to be consistent with the public interest approach.

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[1] Joskow and Noll (1981) call this normative analysis as positive theory.

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Most of the deregulation in the U.S., affecting such industries as railroads, trucking, airlines, long-distance telecommunications, oil, and natural gas, has taken place at the national level, thereby leaving little scope for cross-sectional analysis. Bank branching regulation, however, operated on a state-by-state basis, and deregulation occurred at the state level until the 1994 Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) effectively eliminated such restrictions nation-wide. Branching deregulation therefore provides a richer testing ground than other recent episodes of deregulation for empirical analysis of the theories of regulatory exit.

This paper provides one of the first systematic accounts of deregulation using the economic approach.[2] We focus on the elimination of restrictions on bank branching during the last twenty-five years, reversing policies that had been in place for more than a century. Branching restrictions primarily benefitted smaller and less efficient banks against competition from larger and more efficient banks (see Jayaratne and Strahan forthcoming). We argue that technological, legal, and financial innovations beginning in the early 1970s caused a change in the long-standing political equilibrium in support of anti-branching statutes by eroding the relative value of the restrictions to the prime beneficiaries and enhancing the relative strength of other interest groups.[3] We explore how competition among interest groups, including rival financial services providers and borrowers in addition to the large versus small bank interests, can explain the demise of both state and federal bank branching restrictions (see Becker 1983

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[2] Jarrell's (1984) analysis of the end of fixed commissions at the New York Stock Exchange is perhaps the only other paper to try to do so. See Peltzman (1989) and Noll (1989).

[3] Note that such deregulation is in the "public interest" but, as we discuss below, its timing is not consistent with this approach.

and Kroszner and Stratmann 1997).

After briefly describing the origins of banking regulation as part of state government financing strategies following the adoption of the U.S. Constitution (Kroszner 1997), the next section examines specific shocks that tipped the balance in favor of the intra- and inter-state branching and banking interests at both the state and federal levels. This analysis examines the common factors affecting all of the states and accounts for the trend toward deregulation starting in the 1970s. Section III presents our hypotheses, empirical models, and results. We explain the timing of intrastate branching deregulation across states using a hazard model with proxies for the relative strength of the potential winners and losers. We then show that the *ex post* consequences of deregulation for the different interest groups is consistent with the *ex ante* lobbying patterns we infer from the hazard model. The same interest group factors that explain the relaxation of state laws against branching also explain the voting pattern of legislators in the U.S. House of Representatives concerning federal repeal of interstate branching regulations. We conclude with implications for research on regulatory exit generally and for the future of financial deregulation.

II. The Origins and Demise of Geographical Restrictions on Banking

A. Origins in Public Financing Strategies

After the United States Constitution prevented the states from issuing fiat money and from taxing interstate commerce, states used their powers over banks to generate a substantial part of their revenues (Sylla, Legler, and Wallis 1987). States received fees for granting bank charters, and they often owned or purchased shares in banks and levied taxes on banks. During

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the first third of the nineteenth century, for example, the bank-related share of total state revenues exceeded 10 percent in a dozen states. In Massachusetts and Delaware, a majority of total state revenue was bank-related.

States used their regulatory authority over banks to enhance revenues coming from this source.[4] In particular, each state had an interest in restricting competition among banks, and many of the restrictions on the geographical expansion of banks originate in this period. To enter the banking business, one had to obtain a charter from the state legislature. States received no charter fees from banks incorporated in other states, so the states prohibited out-of-state banks from operating in their territories—hence the origin of the prohibition on interstate banking.[5]

In addition to excluding banks from other states, the legislatures often restricted intra-state expansion. States would grant a charter for a specific location or limit bank branches to that city or county, but these restrictions would also typically protect the bank from intrusion by branches of another bank.[6] By adopting branching restrictions, the states were able to create a

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[4] Noll (1989) has characterized conceiving of governments as distinct interest groups concerned about financing their expenditures as the Leviathan Approach; see Buchanan and Tullock (1962), Niskanen (1971), and Brennan and Buchanan (1977).

[5] With the passage of the National Banking Act in 1864, the federal government also began to charter banks (motivated by a desire to use such institutions to help to fund the Civil War; see Kroszner 1997). State authority over these institutions, for example, whether national banks could operate in multiple states and whether they would be subject to state branching restrictions, was ambiguous. The 1927 McFadden Act clarified the law, and until the 1994 Riegle-Neal IBBEA, states effectively had the right to prevent interstate branching and to force national banks to conform to state branching regulations. See White (1983).

[6] Until the early 1990s, for example, the Illinois Banking Commission would grant "home office protection" which prohibited a bank from opening a branch within a certain number of feet of another bank's main office.

series of local monopolies from which they could extract at least part of the rents. Some state legislatures even passed "unit banking" laws that prevented a bank from having any branches. Such regulations, naturally, produce beneficiaries who are loathe to give up their protections and privileges. Benefits tend to be concentrated, while costs to consumers of a less efficient and competitive financial sector tend to be diffuse (e.g., Stigler, 1971; Peltzman, 1976).

B. Shocks to the Equilibrium Supporting Geographical Restrictions on Banking

The market for financial regulation, like all regulation, involves competition among special interest groups, with significant campaign contributions at both the state and national levels and with members providing votes to supportive politicians (see Makinson 1992, pp. 42-45, and Kroszner and Stratmann 1997). Financial services interests, for example, rarely comprise a unified block, with much of their lobbying effort involving competition among themselves. The beneficiaries were able to support an equilibrium coalition in favor of geographical restrictions despite their costs to (unorganized) consumers of financial services long after the value of them to governments as a key source of revenue had faded. Smaller banks were the main winners from branching restrictions, which protected them from competition from larger and more efficient banking organizations (for evidence on this point see Jayaratne and Strahan, forthcoming). Consistent with this result, small banks historically have fought to maintain and extend such restrictions (White 1983, Abrams and Settle 1993, Hubbard et al. 1996).[7]

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[7] Hubbard, Palia, and Economides (1996) provide evidence that voting in Congress for the 1927 McFadden Act responded to small state banks' interest in limiting competition from large national banks. See also White (1983) and Abrams and Settle (1993).

For the economic theory to provide a convincing explanation of regulatory exit, it should be able to explain why deregulation begins in the 1970s as well as the timing of the state-by-state reforms once the wave of deregulation starts. We examine the latter in detail below. Here we explore whether we can identify broad technological, legal, and economic shocks that would alter the political-economy equilibrium that had existed until the 1970s. State branching laws remained stable since the Great Depression, and many states had adopted their restrictions more than a century earlier. While we provide no formal statistical tests here, we investigate whether such shocks can plausibly explain the general relaxation of intra-state branching and inter-state banking restrictions that begin in the 1970s and culminate in the phase out of inter-state branching restrictions with the 1994 Riegle-Neal IBBEA (see Kane, 1996), which effectively codified at the national level what had been occurring during the previous two decades at the state level. We now turn to the specific shocks.

Beginning in the 1970s, three major innovations reduced the value to the protected banks of local geographic monopolies by increasing the elasticity of depositors' funds. First, the invention of the automatic teller machine (ATM) helped to erode the geographic ties between customers and banks. After some legal challenges, an ATM was determined not to constitute a branch, thereby permitting ATM networks to spread throughout the United States and the world. Table 1 shows the rapid proliferations of ATMs, which did not exist before 1970. Second, consumer-oriented money market mutual funds and the Merrill Lynch Cash Management Account also originated in the 1970s (see Nocera 1994). These types of new opportunities for individuals demonstrated that banking by mail and telephone provided a

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feasible and convenient alternative to local banks.[8] From zero in 1970, Table 1 shows that money market mutual funds have grown to be roughly one quarter the size of deposits held at banks. Third, technological innovation and deregulation have reduced transportation and communication costs, particularly since the 1970s. Customers can now use distant banks at a lower cost.

Since the increasing elasticity of deposits supplied to banks reduces the value of geographical restrictions to their traditional beneficiaries, we argue that these beneficiaries had less incentive to fight strenuously to maintain them. While any deregulation that eliminates inefficient regulation is broadly consistent with the public interest theory, the timing of the deregulation is difficult to explain by that approach. The deregulation occurs precisely when the branching restrictions are becoming less burdensome for the public, due to the elasticity-increasing innovations discussed above (see Peltzman 1976). If deregulation were motivated by public interest concerns, the lifting of branching restrictions would have happened much earlier when depositors were more dependent on local banks for both asset management and payments services.

On the lending side, increasing sophistication of credit-scoring techniques, following innovations in information processing technology, financial theory, and the development of large credit data bases, has begun to change the relationship-character of bank lending towards less personal and more standardized evaluation. As a result of these innovations, for example,

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[8] Regulation Q, which limited the interest rates that banks could pay on deposits, may have helped to drive depositors away from banks when the gap between market rates and deposit ceilings grew during the 1970s.

a national market developed for residential mortgages in the late 1970s. In the 1980s, consumer lending relied increasingly on automated information processing, leading to the development of credit card securitization. In recent years even banks' lending to small businesses has become increasingly automated, relying less on the judgement of loan officers and more on standardized credit scoring programs.[9]

Technological change thus has diminished the value of specialized local knowledge that long-established local bankers might have about the risks of borrowers in the community. Such changes have increased the feasibility and potential profitability for large banks to enter what had traditionally been the core of small bank activities. The large banks have therefore had an incentive to increase their lobbying pressure to attain the freedom to expand into these markets. In addition, as the value of a local banking relationship declined, small firms that were the main borrowers from the small banks also would be more likely to favor the entry of large banks into local markets.

These factors combined to start undermining the economic performance of the small banks that had benefitted most from the geographic restrictions. Table 1 shows the relative decline in small banks' market share even prior to the branching deregulation that begins in the early 1970s.

Kane (1996) argues that another major shock to the old equilibrium is an increase in the

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[9] Wells Fargo, for instance, has initiated a national solicitation campaign for small business loans which are approved based on credit scores. As a result, this large bank's portfolio of small business loans rose by about one-third between June 1995 and June 1996. (This calculation adjusts for the effects of Wells' purchase of First Interstate.) Source: authors' calculations based on data from the 1995 and 1996 *Reports of Income and Condition*.

public's awareness of the costliness of having government-insured but (geographically) undiversified financial institutions. In the late 1970s, as Table 1 shows, the failure rate of banks begins to rise. In the 1980s, the Savings and Loan crisis and taxpayer bail-out further heighten the awareness by the public of the costs of restrictions that make depository institutions more fragile and more likely to require infusions of taxpayer funds. The failures thus may have heightened public awareness of and support for branching deregulation. In addition, Gunther (1994, 1996) argues that declines in bank capital reduced banks' incentive to engage in costly lobbying efforts to preserve branching restrictions, since the probability of collecting the rents generated by these restrictions falls as the probability of failure rises.

Finally, financial services interests outside of banking also have played an important role in the battle over branching deregulation. The insurance industry, particularly the independent insurance agents, have traditionally opposed the removal of restrictions on the banks. The National Banking Act of 1864 and subsequent related legislation appeared to limit strictly national bank involvement in insurance, for example, to banks in cities with a population of no more than 5,000. Some states, however, permit state banks to sell various insurance products. The precise interpretation of these laws, including what contracts are defined as "insurance" and whether a bank located in one "small" city may sell insurance to customers throughout the country, has been the source of longstanding litigation between the insurance and banking sectors.[10] The insurance agents were particularly concerned that, if the courts do broaden the

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[10] Under the National Bank Act, national banks may act as agents in the sale of insurance in towns with fewer than 5,000 people. In 1986 the Comptroller of the Currency authorized banks to sell insurance from small towns to customers without geographic limit. This decision was upheld by the Courts in Independent Ins. Agents v. Ludwig. The Comptroller also expanded national banks' ability

insurance powers of banks (and the court decisions have been leaning increasingly in this direction), unrestricted development of a branch network might give the banks a competitive advantage in insurance distribution.

C. A Brief History of Recent State Branching Deregulation

Banks and bank holding companies faced restrictions on expansion across state borders until relatively recently (see Macey and Miller 1992). The Douglas amendment to the Bank Holding Company Act of 1956 prevented holding companies from acquiring out-of-state banks unless that state explicitly permitted such acquisitions by statute. Since no state allowed such acquisitions, holding companies were effectively prohibited from crossing state lines, although the Bank Holding Company Act grandfathered nineteen existing multi-state holding companies. In 1975 Maine passed legislation permitting out-of-state bank holding companies to acquire in-state Maine banks, beginning in 1978. Furthermore, as part of the 1982 Garn-St Germain Act, federal legislators amended the Bank Holding Company Act to allow failed banks to be acquired by any holding company, regardless of state laws (see, e.g., Kroszner and Strahan 1996). Many states then entered regional or national reciprocal arrangements whereby their banks could be bought by any other state in the arrangement. Between 1984 and 1988, 37 states joined one of these arrangements (see Amel 1993).

Prior to the 1970s, most states also had laws restricting within-state branching, although in many cases a holding company could expand throughout a state by setting up multiple bank

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to deal in insurance products in 1985 and 1990 by allowing banks to sell variable and fixed-rate annuities in small towns. These powers were upheld by the Supreme Court in Valic v. Clarke. Finally, the Supreme Court struck down states' attempts to circumvent the Comptroller's decision in Barnett Bank of Marion County v. Nelson. For further details, see Sparks (1996).

subsidiaries. From the middle of the 1970s to the present, most of these states have deregulated the restrictions on intrastate branching. Reform of restrictions on intrastate branching typically occurred in a two-step process. First, states permitted multi-bank holding companies (MBHCs) to convert subsidiary banks (existing or acquired) into branches. MBHCs could then expand geographically through merger and acquisition of banks in the state and these banks would then be converted into branches of the acquiring bank. Second, states began permitting *de novo* branching, whereby banks could open new branches anywhere within state borders. By permitting branching only through merger and acquisition before de novo branching, states were allowing incumbent banks to maintain the ability to extract at least a portion of the rents associated with barriers to entry from purchasing banks. Table 2 and Chart 1 illustrate the history of state deregulation of geographical restrictions.

D. Branching Deregulation at the National Level

The changes unleashed by these state-level reforms play an important role in the struggle over the federal-level repeal of interstate branching and banking prohibitions (see Kroszner 1997). As the interests in favor of branching restrictions began to lose at the state level and more states permitted out-of-state bank holding companies to enter, the value of the national prohibition on interstate banking diminished. The relaxation of the interstate prohibition also led to the growth and increasing political strength of so-called super-regional banks, such as what is now Nationsbank, which were quite successful expanding their operations into numerous states. With the series of court decisions going against the insurance interests and the relaxation of barriers at the state level already giving banks greater reach, the insurance industry pulled back from its strong opposition to interstate legislation at the national level. A

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series of deft procedural moves by proponents of deregulation, such as permitting voice rather than roll-call votes on the bill, then helped to bring the Riegle-Neal IBBEA to passage in the summer of 1994, and the President signed the Act into law on September 9, 1994. The Act permitted states to pass legislation to opt out of the interstate banking provisions if the legislature did so before the provisions were to go into effect in mid-1997. Since only Texas and Montana have passed opt-out legislation, the United States will now have nearly complete interstate banking and branching.

This brief summary of the changing background conditions helps to provide an explanation consistent with the economic theory — and difficult to square with the public interest theory — of why branching deregulation took place beginning in the 1970s, and not earlier. The technological, economic, and legal shocks generated conditions that helped to increase the marginal product of lobbying in favor of repealing branching restrictions precisely when the relative value to the small banks of maintaining political support for branching restrictions was declining. We now turn to consider the exact timing of deregulation across the states to investigate the predictions of the economic theory in more detail.

III. Testing the Economic Theory of Regulation

From a research standpoint, a salient feature of the deregulation described above is that states eliminated branching restrictions at different times during the past quarter century. This cross-sectional and time-series variation provides an unusually rich data set with which to explore the predictions of the economic theory for deregulation. We focus on modeling the political economy of the intrastate branching deregulation by the states for two reasons. First,

unlike the intrastate deregulation, most of the deregulation of interstate banking occurred during a narrow five year interval (see Table 2). Second, modeling the time at which a state chooses to enter an interstate banking arrangement is complicated by the strategic interdependence of the states' behavior. The benefits to potential acquirers increase with the number of states in an arrangement since the pool of target banks expands with the number of states; the benefits to potential targets may increase with the number states in an arrangement since the expected selling price increases with the number of bidders (Brickley and James 1987). Rather than examine the passage of interstate statutes by the individual states, we will analyze the interstate deregulation that takes place at the national level by modeling voting behavior in the House of Representatives on federal interstate branching legislation.

A. Hypotheses and Data

The key assumption of our theory is that different interest groups can provide money and votes to politicians who, in turn, control regulatory entry and exit. Our hypotheses will relate the timing of and support for reforms across the states to the economic interest variables. Table 3 summarizes the hypotheses and variables used in our analysis.

Hypothesis 1: Relative Importance of Interests within the Industry. Reform should occur later in those states where the strength of the small banks relative to that of the large banks is the greater.

States that deregulated first should have the lowest measures of small bank importance and, hence, weakest lobbying ability to fight the larger banks and consumer advocates promoting deregulation. Our main proxy for the relative strength of the small bank lobby is the fraction of all banking assets in the state in "small" banks. We define small banks as those

banks with assets below the median size bank in each state. This definition of small varies across the states and takes into account cross-state heterogeneity in bank sizes. We also considered a variety of other definitions of relative size, but our results are not sensitive to which definition we use.[11]

An alternative measure of small bank strength concerns the relative performance of small and large banks in the state. For this measure, we compare the capital-to-asset ratio of the small and large banks. Specifically, we subtract the asset-weighted average capital-asset ratio for small banks from the asset-weighted average capital-asset ratio for large banks. This measure proxies for the health of the small banks and, hence, how likely they are to be able to continue to provide support for the legislators and regulators who favor branching restrictions (see Kroszner and Stratmann 1997). As small bank performance declines, politicians may then expect that the future stream of contributions from small banks will fall and, hence, may be more likely to abandon their cause. Annual data on bank size and performance are from the fourth quarter *Reports of Income and Conditions* ("Call Reports") from the Federal Reserve Board.

Hypothesis 2: Relative Importance of Rival Producer Interests. Reform should occur later in states where banks can sell insurance and the insurance industry is important

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[11] First, we used a fixed measure of small bank that did not vary across states, defining small banks as those with assets below $100 million in 1994 dollars. Second, we applied the state-varying and fixed definitions at the level of "banking organizations" (which include multi-bank holding companies) instead of at the level of banks. Third, we calculated gini coefficients of bank size inequality and bank concentration indices as alternative proxies for small versus large bank power in the state. Finally, we also considered banks in "rural" areas (that is, not located in a Bureau of Census "standard metropolitan statistical area") as small since the value of the restrictions might be greatest in protecting banks outside of cities from entry by the city banks. All of the alternative definitions are highly correlated, and they do not affect our results.

relative to the banking industry.

As noted above, a number of states permit state-chartered commercial banks to sell insurance. In those states, the insurance lobby would be particularly concerned about the relaxation of branching restrictions because such deregulation might permit banks to provide an efficient insurance distribution network that might outcompete the insurance agents. To measure this effect we first construct an indicator variable that is 1 if the state permits banks to sell insurance.[12] We then interact this variable with a measure of the size of the insurance sector (total value added in the state) relative to the sum of the banking plus insurance sectors. Data on value-added by industry are from U.S. Commerce Department, Bureau of Economic Analysis, *Survey of Current Business* (August 1994).

Hypothesis 3: Relative Importance of Consumer Interests. Reform should take place earlier in states with a higher proportion of consumers dependent upon the less efficient banks and where bank customers pay higher prices for bank services.

Banks are a major source of credit for small firms (Cole and Wolken 1994). If branching deregulation would either force banks to become more efficient or reduce local market power, then small firms would favor branching deregulation. In support of this notion, Jayaratne and Strahan (forthcoming) find that after branching deregulation, more efficient banks expand at the expense of less efficient banks, leading to lower loan prices. Moreover, Strahan

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[12] In the results presented below, the indicator is set equal to one for those states that permit state banks to sell insurance throughout our sample period. A few states, however, do not permit state banks to sell insurance during the first part of our sample period and then deregulate and permit insurance sales by banks during in the latter part of the sample; these states were set to 0 throughout the sample in our main specifications. The results reported below, however, do not change if we set the insurance indicator equal to 1 if a state permits its banks to sell insurance in that year and 0 otherwise.

and Weston (1997) and Berger et. al (1997) find that lending to small businesses increases on average when small banks are purchased by other banking organizations. Since bank borrowers seem to have benefitted from branching deregulation in particular and bank consolidation in general, we expect that small firms would prefer deregulation. We measure the relative importance of small firms by the proportion of all establishments in the state with fewer than 20 employees. These data are complied by the Bureau of the Census.[13]

In addition, the cost of the branching restrictions to bank customers can be related to the prices paid for bank services.[14] We use the average interest rate on loans as a measure of prices, equal to the ratio of total interest income on all domestic loans divided by total domestic loans held by banks operating in the state. These data are from the end-of-year Call Reports but become available beginning only in 1976.[15] We focus here on the price of loans rather than the price of deposits since Jayaratne and Strahan (forthcoming) find that deregulation of branching

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[13] We have collected the establishment data by state for three cross-sections (1976, 1982 and 1987) and interpolated the data in the intermediate years. See State and Metropolitan Data Book, 1982, 1986 and 1991.

[14] High initial prices may reflect a large market share for the inefficient, high cost banks and thus a great opportunity for profitable growth for the efficient banks if the barriers are relaxed. Since high prices also could be a proxy for high rents being earned by the banks, hence the value to the protected banks of maintaining the restrictions, we must exercise some caution in predicting the sign of this relationship.

[15] Deregulation will tend to have a greater impact on interest rates paid by small firms rather than large firms because the latter can access a national (or at least interstate) market for loans whereas the former may have few options beyond the local banks. While changes in the average loan interest will reflect the changes to the costs of smaller borrowers, we will also use the average rate on unsecured loans below $1 million as an alternative measure of the costs of the restrictions. These data are from the Survey of the Terms of Bank Lending, Federal Reserve Board. Unlike the Call Report data which are comprehensive, these numbers arise from a survey that oversamples large banks and are available for a shorter period of time. Nonetheless, the two series are highly correlated (correlation coefficient is 0.7) so reflect similar information about variation in bank borrowing costs within the state.

restrictions leads to declines in loan rates but no change in deposit rates.

B. Methods and Results

First, we develop a hazard model to determine the influence of the political economy factors on the pattern of intrastate branching deregulation across the states. Second, we examine the how our variables change in "event time" with the event being the year of deregulation. By analyzing the time-series variation in these factors surrounding deregulation, we investigate whether the impact of deregulation on the different interest groups is consistent with the lobbying patterns we infer from the hazard model. Finally, we analyze federal interstate branching deregulation with a probit model to explore whether the interest group factors that affect the timing of intrastate deregulation also influence voting in the House of Representatives on interstate deregulation.

1. Hazard Model

The most appropriate approach for estimating how the timing of deregulation is related to our political economy variables is a hazard model, which is the standard procedure for dealing with duration data (Kalbfleisch and Prentice 1980, Kiefer 1988, Greene 1997). Since we are trying to explain when deregulation occurs, we can consider the period from the beginning of our sample (1970) until deregulation as the "duration of regulation" or the "time until deregulation." In our model, the hazard rate, $h(t)$, is the likelihood that a state deregulates at time t, given that the state has not yet deregulated by that time.

To model the duration of regulation, we must decide what structure, if any, to impose on the hazard function. Our discussion above of the technological, legal, and economic shocks eroding the anti-branching coalition suggests that the hazard function for branching deregulation

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should show positive duration dependence, that is, the hazard rate should be rising with time because the shocks increasingly undermine the anti-branching forces relative to the pro-branching forces. The Kaplan-Meier product-limit estimator provides a simple, non-parametric way to estimate the shape of the hazard function (see Greene 1997).[16] Chart 2 graphs this estimate for our data and, consistent with our explanation of how the shocks affect the support for the old regulatory equilibrium, shows that the hazard function is relatively flat in the early years and then grows steeper in the later years.

A duration model that can approximate this shape is the Weibull proportional hazards model. The hazard rate function takes the form:

$$h(t) = h_0(t)exp\{b_0+b_1 x_{1t}+ ... +b_k x_{kt}\}$$

where the baseline hazard rate, $h_0(t)$, is pt^{p-1} and p is the shape parameter that will be estimated from the data. When $p > 1$, this model displays a monotonically increasing hazard rate. In this formulation, we allow the political economy factors affecting the hazard rate (that is, the x's) to vary over time. The b_i and p are estimated by maximum likelihood. In calculating the standard errors, we use a robust estimation procedure that adjusts for the fact that the same state appears repeatedly in the risk pools so that observations of the same state over time are not independent (see Lin and Wei 1989 and Stata 1997). Table 4 reports summary statistics and correlations for the explanatory variables we use in our analysis.

Our motivation for choosing the Weibull model, rather than a model that does not

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[16] Denote each of the K years in our sample period T_k and order them such that $T_1 < T_2$ and so on. Let n_k be the number of states that have not yet deregulated by T_k and d_k be the number of states that deregulate in year T_k. The Kaplan-Meier estimate of the hazard rate in each year is d_k/n_k.

impose any structure on the baseline hazard rate, is that the assumption of a particular structure permits us to calculate the change in the expected time to deregulation for a given change in the levels of the covariates.[17] In the Weibull model, we can invert the hazard function and map it into the time domain. Rewriting the Weibull model in this way, the log of the time to deregulation T is a linear function of the time-varying political economy factors and an error term: $\ln(T) = b^*x + e$.[18] Because we are assuming that the baseline hazard rate is Weibull with a shape characterized by p, the new coefficients on the x_{it} will be scaled by p, that is, $b_i^* = -b_i/p$.

The b_i^* coefficients represent the percentage change in the time to deregulation for a one unit change in the corresponding x_i. A positive coefficient, for example, implies that an increase in the variable also increases the expected time until deregulation. To gauge the economic importance of the effects, we will multiply the b_i^* by the standard deviation of the explanatory variable in question and then evaluate how much this change in the variable raises or lowers the expected time to deregulation.

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[17] The Cox proportional hazards model does not impose any structure on the baseline hazard rate, $h_0(t)$, and takes the form:

$$h(t) = h_0(t)exp\{b_1 x_{1t} + \ldots + b_k x_{kt}\}.$$

Common factors that affect the probability of deregulation in the same way for all states therefore do not influence the estimated coefficients. The cost of the Cox model is that, because there is no structure on the baseline, we can calculate changes in only relative hazard rates associated with changes in the covariates. The Weibull model, however, provides sufficient structure so that we can translate our estimates into a log expected time metric that allows us to calculate the change in the expected time to deregulation for a given change in the covariates. (See Kiefer 1988, Greene 1997 and Stata 1997). Fortunately, when we compare the coefficients estimated by the Cox and Weibull models on our data, they are very close (see Appendix I). Imposing a Weibull model, thus, does not appear to distort our estimates.

[18] The error term e is independent of x and has an extreme value distribution scaled by $1/p$ (see Kiefer 1988, Greene 1997 and Stata 1997 for more details on this log expected time parameterization of the Weibull model).

In Table 5, we report the b_i^* coefficients. The specification in column (1) includes all of the political economy factors for which we have data over the entire 1970 to 1991 period. The positive and highly statistically significant coefficient on small bank share implies that a greater small bank share in the state tends to delay regulation. Moreover, this effect is economically important. A one standard deviation increase of small bank share results in a 28 percent increase in the time until deregulation. The mean (median) number of years until deregulation in our sample is 15.8 (17.5), so this coefficient implies that a one standard deviation increase in small bank share delays deregulation by 4.4 (4.9) years. The relative performance of small banks in the state yields similar results. The positive and statistically significant coefficient on the capital-to-asset ratio of small banks relative to large banks implies that deregulation also occurs later when small banks are relatively strong. A one standard deviation increase in the relative capital-to-asset ratio results in a 14 percent rise in the time until deregulation, which translates into an increase of 2.2 (2.4) years from the mean (median). These results suggest that interest group strength within the industry affected the timing of the regulatory exit, consistent with Hypothesis 1.

We now consider the role of rival interests on the deregulatory process. In states where banks can sell insurance, a large insurance sector relative to the banking sector is associated with a greater expected time to deregulation. A one standard deviation increase in the relative size of the insurance sector (in those states which permit banks to sell insurance) leads to a 16 percent increase in the time until deregulation, which at the mean (median) is 2.5 (2.9) years. This result supports Hypothesis II concerning the desire of the insurance interests to support restrictions on banks where they are rivals.

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Turning to the role of consumer interests, we find that a greater share of small firms in the state tends to hasten the timing of the deregulation. Again, the share of small firms is economically important as well as statistically significant. A one standard deviation increase in the share of small firms reduces the time until deregulation by 20 percent, which speeds deregulation by about 3 to 3.5 years. This result is consistent with the Hypothesis III that small firms prefer more competition from large banks in local banking markets and lobby to that end. The main implications of the economic theory of regulatory exit thus are supported in the data.[19]

To examine the robustness of the results, we first explore whether the initial type of branching regulation within the state, which may proxy for omitted factors determining the strength of the political-economy equilibrium within the state prior to the shocks beginning in the 1970s, had any effect on the pattern of deregulation. We divide the sample into states with the most extreme form of branching regulation, unit banking, and those that had less onerous restrictions. Sixteen states began the sample period with unit banking restrictions.[20] Column (2) of Table 5 includes an indicator variable equal to one if the state began the period with unit banking restrictions. The coefficient on this variable is positive and statistically significant, indicating that unit banking states tended to deregulate about 3 to 3.5 years later, all else equal.

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[19] Also, as a rough way to examine how the cross-section of initial conditions affects the timing of deregulation across the states, we ran an OLS model and found similar results. In the OLS, the dependent variable is the number of years from 1975 until branching deregulation is enacted for all states that deregulated after 1975, thereby giving us a sample size of 35 states. The 1970-1975 averages of the independent variables are the measures of initial conditions in each state. We find: a greater initial small bank share of assets in the state delays deregulation; in states where banks can sell insurance, a greater initial size of insurance relative to banking also delays deregulation; and, a greater initial fraction of small firms in the states speeds deregulation.

[20] We classify states that prohibited branching but permitted banks to establish facilities as unit banking states.

As column (2) shows, however, the other results are little changed when the unit banking indicator is included.[21]

As an additional robustness check, we divide the country into four regions — North, South, Midwest, and West — to determine whether any region-specific factors were driving our results.[22] When we include the regional indicators (column 3), the impact of small bank share and small firm share are strengthened relative to column 2. The coefficient on the relative capital-to-asset ratios of the small and large banks falls but remains statistically significant at the 10 percent level. The estimated coefficients on the insurance variables, however, decline and the interaction term is no longer statistically significant. While the inclusion of regional indicators does not affect the support for Hypotheses I and III, the results on insurance do appear to be sensitive to the specification.

The last column of Table 5 includes the average interest rate on loans in the state as a rough proxy for the cost to bank borrowers of these regulations. These data become available only in 1976, so our sample size shrinks to 408 observations. The coefficient on this variable is negative, implying that high rates on loans tend to speed deregulation, but is small and not

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[21] We also conducted a likelihood ratio test of whether the unit banking states could be pooled with the other states and could not reject pooling of the data (LRT = 12.5, distributed chi-square (7) under the null hypothesis). Although conditions which lead to the adoption of unit banking in a state, *ceteris paribus*, do appear to delay deregulation, they do not affect how the interest group factors we identify influence regulatory exit.

[22] Since intrastate deregulation generally preceded interstate deregulation and the latter typically took the form of regional interstate compacts, it is possible that the potential for participating in a regional interstate banking compact could have influenced the decision to deregulate intrastate branching. Our definitions of the regions are: region 1 (South) contains AL, AR, DC, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX and VA; region 2 (Northeast) contains CT, MA, MD, ME, NH, NJ, NY, PA, RI, VT and WV; region 3 (Midwest) contains IA, IL, IN, KS, MI, MN, MO, NE, ND, OH, SD and WI; region 4 (West) contains the other states.

statistically significant. As noted above, the interpretation of the interest rate variables is less

straightforward than for the other variables because it might also proxy for the extent of the

rents that protected banks were earning in the state. The results on the other variables are

similar in this subsample, providing another robustness check on our results.[23]

Finally, we explored whether the stability and soundness of the banking sector in the

state might affect the timing of deregulation. Since geographic diversification through

branching could mitigate instability problems that were important during much of our sample

period, a public interest theory might predict that deregulation should occur where the social

benefits are greatest, namely, in states where banking instability is greatest. Alternatively,

instability may reduce the incentives of banks to lobby to maintain protections since they are

now less likely to survive to reap the benefits of the restrictions (Gunther 1994, 1996). Also,

deregulation can arise as a response to banking instability in an ignorant or misinformed voter

theory, in which a banking crisis makes the previously ignorant public aware of the costs of the

anti-branching policy (see Kane 1996).

To test for an association between banking problems and the timing of deregulation, we

included the capital-to-asset ratio of all banks in the state or the failure rate of banks, either

unweighted or weighted by the size of the failing banks. In two of these three specifications,

the distress variable was not statistically significant, while in the other the unweighted failure

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[23] As further robustness tests, we included state personal income in the hazard model to control for business cycle effects. The coefficient estimates were small, statistically insignificant, and did not affect the other coefficient estimates or their statistical significance. We also tried a population density variable, which Abrams and Settle (1993) found relevant for regulatory change during the 1920s and 1930s, but its coefficient was not statistically significant and did not affect the other results.

rate entered with the wrong sign. The inclusion of these variables did not affect the other

results. We thus do not find a linkage between the timing of state deregulation and state-wide

banking distress. As noted above, however, the fragility and failure of banks may have raised

the public's consciousness at a national level, rather than a state level, because deposit insurance

is funded federally. This might account for why the overall level of bank capitalization and the

rate of bank failures within a state does not appear to have any effect in the hazard model but

the general timing of deregulation occurs just as bank instability increases.

2. Event Time Graphs

To check whether the lobbying patterns we infer from the hazard results are consistent

with impact of deregulation on the different interest groups, we construct an event time index

relative to the date at which branching deregulation goes into effect (Table 2). The year of

deregulation is defined as time 0; years before deregulation are negative and years after

positive. For each series, we first subtract the average value for all states in each calendar year

to eliminate trends not associated with deregulation (e.g. secular trends due to technological

change and business cycle factors). We then plot the average value of the detrended series for

each year for those states that deregulated their branching restrictions.

Chart 3 shows how small bank share changes relative to national trends in the years

surrounding deregulation. Prior to deregulation, small bank share shows little variation,

although the small bank share is above the national average. Chart 4, however, shows some

deterioration of small banks' capital ratio relative to that of large banks' in the years preceding

deregulation. As these charts illustrate, deregulation then has a profound impact on small

banks' fortunes. Following deregulation, small bank market share declines rapidly, as the large

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banks expand through internal growth and their purchase of small banks. This result is consistent with the small banks anticipating the consequences of deregulation and opposing them. Moreover, the relative capital-to-asset ratio of the small banks improves markedly following deregulation, reflecting the fact that the weakest small banks are the most likely to sell out to the larger banks following deregulation.[24]

We now consider the impact of deregulation on the rival's interests. Chart 5 demonstrates that in states that permit banks to enter the insurance business, the insurance sector shrinks relative to the banking sector following deregulation.[25] This consequence of deregulation is consistent with the insurance lobby in these states supporting branching restrictions. Finally, Chart 6 shows that consumers benefit from deregulation through lower average interest rates on loans. This result would explain why users of bank services, particularly small borrowers who do not have access to a national borrowing market, would favor branching deregulation. The event-time graphs thus supports our interpretation of the coefficients in the hazard model: groups that will benefit lobby to speed deregulation and those who are hurt lobby against to slow it.

3. Voting on Interstate Branching Deregulation in the U.S. House of Representatives

We now wish to examine whether the forces we identify as driving intrastate branching deregulation had a similar influence on interstate deregulation. Instead of using the same methods as above for to explain the individual states' pattern of interstate deregulation (due to

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[24] For further evidence consistent with this point, see Jayaratne and Strahan (forthcoming).

[25] The chart ends at year +5 because we do not have sufficient number of observations beyond that.

the narrow clustering of the events and strategic considerations discussed above), we analyze

the voting pattern of members of Congress on interstate deregulation at the federal level. As

noted in section II, after virtually all states adopted intra- and inter-state branching deregulation,

the Riegle-Neal IBBEA of 1994 repealed the 1927 McFadden Act to eliminate all barriers to

interstate banking and branching by 1997. Unfortunately, the key votes concerning the Riegle-

Neal Act were either voice votes or extremely lopsided, so we could not estimate a voting

model from them.

A number of bills and amendments related to interstate branching, however, had been

debated in Congress during the years prior to the passage of the Riegle-Neal IBBEA, but a

search of the weekly *BNA Banking Reporter* and the *Congressional Record* produced only one

roll-call vote related to interstate branching that was not lopsided. This vote occurred in the

House on November 14, 1991 and concerned an amendment sponsored by Wylie (R-OH) and

Neal (D-NC) to introduce interstate banking and branching deregulation as part of a broad

financial services reform package. The Wylie-Neal amendment also included provisions which

would have limited certain insurance and real estate powers of national banks (*Congressional

Record,* November 14, 1991, pp. 10239-42). While the amendment passed by 210 to 208, the

bill to which it was attached subsequently was defeated. The financial services reform

legislation that did pass in 1991, the Federal Deposit Insurance Corporation Improvement Act,

did not address the issue of interstate banking.

To test for the influence of the interest group factors we considered in the state-level

reforms, we examine both the sponsorship of interstate banking legislation and voting on the

amendment. The sponsors of the Wylie-Neal amendment are from states that had very low

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small bank shares: The small bank share in Ohio (Wylie) was 0.04 and in North Carolina (Neal) was 0.02, whereas the sample mean in 1991 is 0.08 (median=0.07). In addition, the Senate's sponsor of the Riegle-Neal IBBEA that passed in 1994 was Senator Donald Riegle, and his home state of Michigan also has a small bank share (0.05). The sponsors of these bills thus are from states with low small bank strength.

Table 6 reports our estimates of a probit model where the dependent variable equals one if the legislator voted in favor of the amendment and zero otherwise. The explanatory variables are the same as those in the hazard model except that we add a party affiliation indicator variable equal to one for Democrats and zero for Republicans. The coefficients in Table 6 are the marginal effects ("slopes") of a one unit change of each variable on the probability that a legislator will vote for the amendment.[26] Note that to compare the effects of interest groups in the hazard and probit models, a force which favors deregulation has a negative coefficient in Table 5 but would have a positive coefficient in Table 6.

Consistent with the state-level deregulation process, we find that legislators are more likely to support the amendment if their states have a relatively low share of small banks. As in the hazard model, the fraction of small banks in the state is the most important influence on a legislator's voting decision (other than party affiliation).[27] The marginal effect from the probit model implies that a one standard deviation increase in small banks' market share (from the mean) is associated with a decline in the probability of voting in favor of branching of

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[26] Since we have multiple legislators from each state, we adjust the standard errors to correct for the potential lack of independence among observations clustered in the same state.

[27] The coefficient estimates are not affected by the inclusion of the party affiliation indicator.

approximately 17 percent. The relative capital-to-assets ratio of small and large banks, however, does not have a statistically significant effect in the probit model.

The impact of the rivals is consistent with intrastate deregulation results. Where banks can sell insurance, legislators from states with larger insurance sectors relative to banking are less likely to vote for the amendment.[28] A one standard deviation increase in the relative size of the insurance sector in those states which permit banks to sell insurance increases the probability that a legislator will favor the amendment by about 13 percent. In contrast to the hazard model, the results on the insurance interaction remain statistically significant even when regional indicators are included in the specification. Turning to consumer interests, the coefficient on small firm share is not statistically significant but the coefficient on interest rates in the state is. A one standard deviation increase in the average interest rate on loans raises the probability that a legislator will support the amendment by roughly 8 percent. Overall, the probit analysis of the vote on national branching deregulation supports the economic theory of deregulation and provides a consistency check that the interests operating on the state legislatures are very similar to those operating at the federal level.[29]

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[28] The positive and statistically estimates on the other insurance variables may reflect insurance industry support the amendment's provisions limiting banks' insurance powers.

[29] The political economy factors in the probit model vary by state but not by legislator. As an alternative specification, we calculated the proportion of the legislators from each state's delegation that voted in favor of the amendment and used the logistic transform of this proportion (that is, the log of the odds ratio) as the dependent variable in a least squares regression. The party variable is the proportion of Democrats in the state delegation. To adjust for heteroscedasticity, we weighted the observations by the square root of the odds ratio divided by the number of legislators in the state delegation. Since no members of the AK and WY delegations voted, we have 48 observations. The results are similar to those reported in Table 6, except that the levels of statistical significance tend to be lower.

IV. Conclusions

Unlike most other industries that have been regulated and deregulated at the federal level, banking has experienced a diverse pattern of regulatory change across states during the last quarter century. Bank branching deregulation thus provides a fertile ground for testing alternative theories of regulatory exit. Although the economic theory of regulation has had mixed success in explaining deregulation in other industries, we show that economic interests can explain the cross-sectional and time-series pattern of state bank branching deregulation as well as the voting pattern in Congress on interstate branching deregulation. While the elimination of inefficient regulation is consistent with the public interest theory, the timing of the branching deregulation — precisely when it was becoming less burdensome to consumers — is not consistent with this approach.

Ours is perhaps the first study to provide a complete account of deregulation using the economic theory in any industry. It is possible that the mixed success of the economic theory in explaining deregulation in other areas may be due to a lack of cross-sectional variation in other industries, rather than a failure of the theory itself. Future empirical work on regulatory exit might then be most fruitful in areas, such as certain types of insurance and franchising deregulation, that have taken place across the states.

In the banking and financial sector, as elasticities continue to increase, that is, as technological and financial innovations erode the benefits to any interest group of maintaining regulatory barriers in financial services, the economic approach would predict continued deregulation. These forces are likely to bring about reforms both domestically, for example, through legislation that would increase bank powers (see Kroszner 1996 and Kroszner and

Rajan 1994 and forthcoming), and internationally, for example, through the extension of financial services provisions of NAFTA to reduce geographic barriers across countries (Kroszner 1997).

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Table 1

Broad Trends in Commercial Banking

Year	Number of ATMs (1)	Domestic Bank Deposits (2)	Money Market Mutual Funds (3)	Percent of Deposits + Money Funds Held by Banks (4)	Small Banks' Percent of Banking Assets (5)	Average Number of Bank Failures (6)
		.....Billions of Dollars....				
1950	0	$154	$0	100	NA	4
1955	0	191	0	100	NA	3
1960	0	228	0	100	24	2
1965	0	330	0	100	20	4
1970	0	479	0	100	18	6
1975	9,750	775	4	99	18	6
1980	18,500	1,182	76	94	17	10
1985	61,117	1,787	242	88	14	60
1990	80,156	2,339	493	83	11	179
1995	122,706	2,552	745	77	8	61

Sources and Notes:

Column 1: ATM figures are from Bank Network News, The EFT Network Data Book (New York: Faulkner and Gray, Inc.). The 1975 figure was unavailable. 9,750 is the number of ATMs in 1978, the first year for which complete data are available.
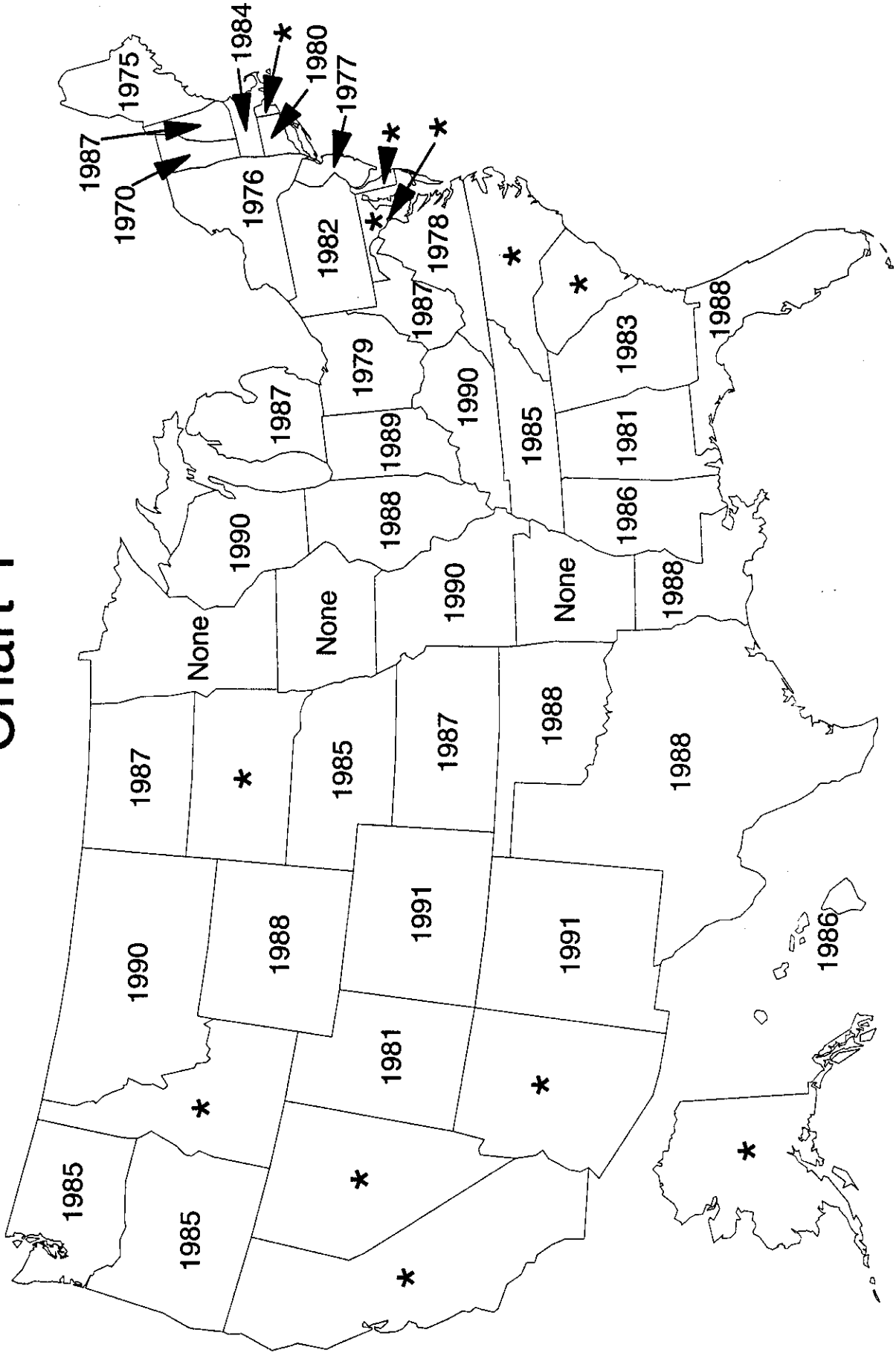
Columns 2-4: Banks domestic deposits are from the Reports of Income and Condition; money market mutual funds are from the Flow of Funds. Data on all bank deposits, foreign plus domestic are only available beginning in 1970. The trend in banks' share (column 4) is the same using total deposits instead of domestic deposits.

Column 5: Percent of banking assets held by small banks, where a small bank is defined as a commercial bank less than $100 million in assets in 1994 dollars. These data are based on the Reports of Income and Condition. Data on small banks are not available before 1960.

Column 6: Five year average number of bank failures, where the final year is indicated in the first column. These data are from FDIC, Annual Report and the Quarterly Banking Profile.

Deregulation of Restrictions on Intrastate Branching
Chart 1

1975

1984

1980

1987

1970

1976

1982

1987

1979

1987

1985

1990

1989

1988

None

None

1990

1990

1991

1991

1981

1990

1988

1987

1985

1988

1987

1988

1981

1986

1983

None

1988

1988

1986

1985

1985

* Permitted Intrastate Branching before 1970

Table 2

Deregulation of Restrictions on Geographical Expansion, by State

|	Intrastate Branching Deregulation	Interstate Banking Deregulation
AK	Deregulated Before 1970	1982
AL	1981	1987
AR	Not Yet Deregulated	1989
AZ	Deregulated Before 1970	1986
CA	Deregulated Before 1970	1987
CO	1991	1988
CT	1980	1983
DC	Deregulated Before 1970	1985
DE	Deregulated Before 1970	1988
FL	1988	1985
GA	1983	1985
HI	1986	Not Yet Deregulated
IA	Not Yet Deregulated	1991
ID	Deregulated Before 1970	1985
IL	1988	1986
IN	1989	1986
KS	1987	1992
KY	1990	1984
LA	1988	1987
MA	1984	1983
MD	Deregulated Before 1970	1985
ME	1975	1978
MI	1987	1986
MN	Not Yet Deregulated	1986
MO	1990	1986
MS	1986	1988
MT	1990	1993
NC	Deregulated Before 1970	1985
ND	1987	1991
NE	1985	1990
NH	1987	1987
NJ	1977	1986
NM	1991	1989
NV	Deregulated Before 1970	1985
NY	1976	1982
OH	1979	1985
OK	1988	1987
OR	1985	1986
PA	1982	1986
RI	Deregulated Before 1970	1984
SC	Deregulated Before 1970	1986
SD	Deregulated Before 1970	1983
TN	1985	1985
TX	1988	1987
UT	1981	1984
VA	1978	1985
VT	1970	1988
WA	1985	1987
WI	1990	1987
WV	1987	1988
WY	1988	1987

Source: Amel (1993).

Table 3: Implications of the Economic Theory for the Timing of Deregulation

Interest Group Factor	Proxy
I. Relative Importance of Interests in the Industry	*Small vs. Large Bank Share:* Small bank assets as a percent of total banking assets in the state.
	Small vs. Large Bank Health: Small bank capital-to-asset ratio relative to that large banks in the state.
II. Relative Importance of Rival Producer Interests	*Relative Size of Rivals:* Value added in insurance to value added in banking in the states where banks can enter insurance.
III. Relative Importance of Consumer Interests	*Share of Small Borrowers:* Small firms (fewer than 20 employees) as a percent of all firms in the state.
	Cost of Bank Services: Interest rate on bank loans in the state.

Small banks are defined as those with assets below the median size bank each state.

Estimates of Hazard Rate for Branching Deregulation

Chart 2
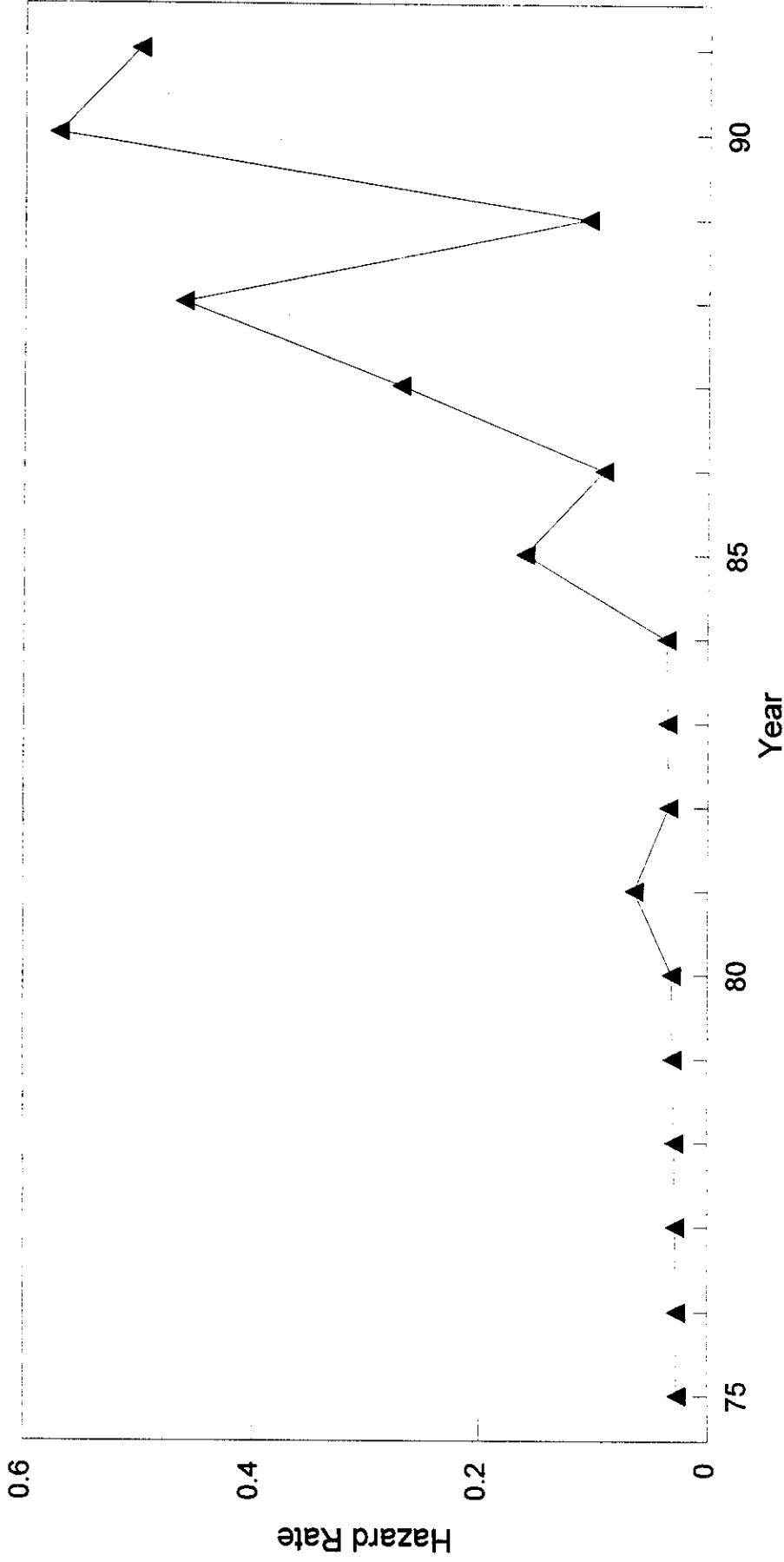
Legend: ▲ Kaplan-Meier Estimate of Hazard

X-axis: Year (75, 80, 85, 90)

Y-axis: Hazard Rate (0, 0.2, 0.4, 0.6)

Table 4: Summary Statistics for Variables in Hazard Model, 1970-1991.

Panel A - Univariate Statistics

	Mean	Standard Deviation	Minimum	Maximum
	(1)	(2)	(3)	(4)
Small bank asset share of all banking assets in state	0.11	0.05	0.01	0.23
Size of insurance relative to banking in the state	0.47	0.09	0.24	0.80
Indicator is 1 if banks can sell insurance in the state	0.20	0.40	0	1
Small firm share of the number of firms in the state	0.88	0.02	0.78	0.95
Capital ratio of small banks relative to large in the state	0.02	0.01	-0.01	0.09
Average interest rate on bank loans in the state	0.11	0.02	0.08	0.16

Panel B - Correlations

	Small Bank	Size of Insurance	Insurance Indicator	Small Firm	Small Bank Capital
	(1)	(2)	(3)	(4)	(5)
Small bank asset share of all banking assets in state	1				
Size of insurance relative to banking in the state	-0.34	1			
Indicator is 1 if banks can sell insurance in the state	0.20	-0.12	1		
Small firm share of the number of firms in the state	0.30	-0.11	0.05	1	
Capital ratio of small banks relative to large in the state	-0.66	0.20	-0.10	-0.06	1
Average interest rate on bank loans in the state	-0.04	-0.37	-0.02	-0.19	0.19

Note: N = 637. The interest rate on bank loans becomes available only in 1976, so N=408.
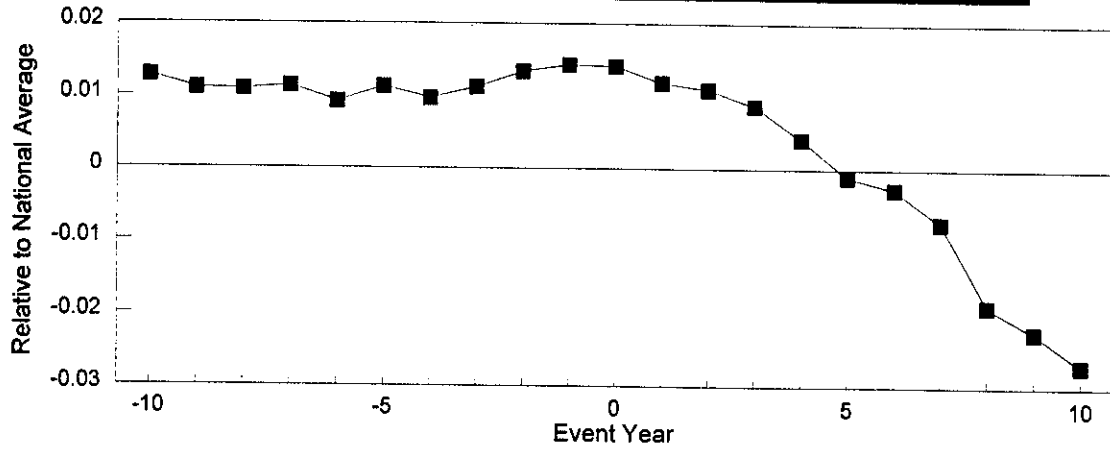
Table 5: Hazard Model of Political Economy Factors Affecting the Timing of State Branching Deregulation, 1970-1991.

The hazard model is Weibull, where the dependent variable is the log expected time to branching deregulation: $\ln(T) = b^*x + e$. All variables are measured for each state in each year. Small bank asset share is the percent of banking assets in the state held by banks below the median size of bank in each state in each year. Relative capital ratio is the capital to assets ratio of small banks minus that of large banks. Size of insurance relative to banking plus insurance in the state is measured as gross state product from insurance divided by gross state product from insurance plus banking. Indicator is 1 if state law permits banks to enter the insurance business and 0 otherwise. Interaction is the product of (insurance's share) * (indicator that banks can sell insurance). Small firm share is the percent of all establishments in the state that have few than 20 employees. The unit banking indicator equals 1 for CO, AR, FL, IL, IA, KS, MN, MO, MT, NE, ND, OK, TX, WI, WV, and WY. Average interest rate on bank loans equals total interest income on all domestic loans made by banks in the state divided by total loans. We also include three indicators for three broad regions in column (3). Robust standard errors in parentheses. ***, **, * denote statistically significant at the 1, 5, and 10 percent levels.

	(1)	(2)	(3)	(4)
Small bank asset share of all banking assets in state	6.12*** (1.26)	4.64*** (1.24)	4.79*** (0.90)	3.56*** (1.06)
Capital ratio of small banks relative to large in the state	12.26*** (3.37)	9.16*** (3.53)	6.14* (3.48)	5.44** (2.75)
Size of insurance relative to banking in the state	-0.83* (0.46)	-0.85* (0.50)	-0.03 (0.31)	-0.96*** (0.29)
Indicator is 1 if banks can enter insurance business in the state	-1.18 (0.75)	-1.00 (0.70)	-0.20 (0.60)	-0.91* (0.55)
Interaction (size of insurance*indicator)	3.28** (1.67)	2.76* (1.57)	0.70 (1.39)	2.45** (1.25)
Small firm share of the number of firms in the state	-10.90*** (2.41)	-10.45*** (2.58)	-14.29*** (2.11)	-5.78** (2.76)
Indicator is 1 if state has unit banking law	-	0.19** (0.08)	0.19*** (0.06)	0.15** (0.06)
Average interest rate on bank loans in the state	-	-	-	-0.25 (2.82)
Includes regional indicators?	No	No	Yes	No
N	637	637	637	408
Log likelihood	-5.70	-3.91	5.86	9.38
p-value of chi^2 for regression	<0.01	<0.01	<0.01	<0.01

Small Bank Market Share in Event Time
Chart 3

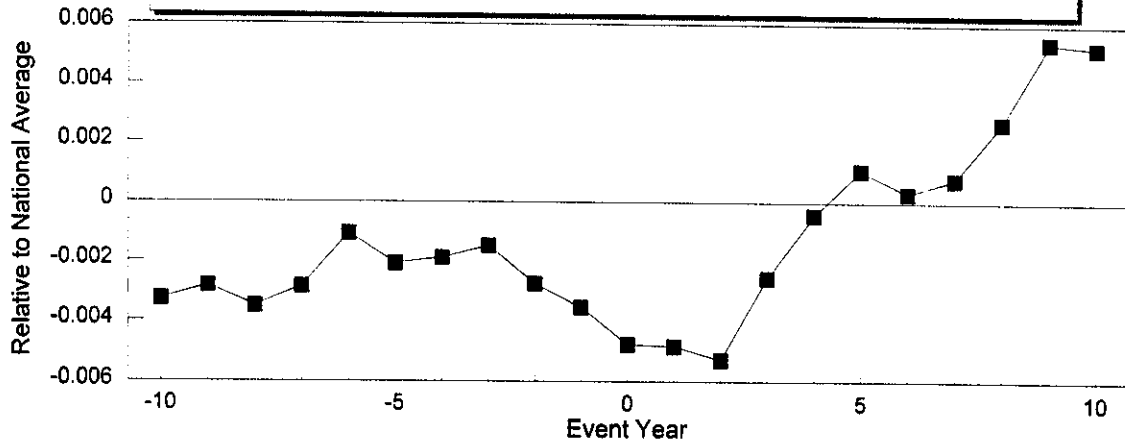**Small Minus Large Bank Capital-Asset Ratio**
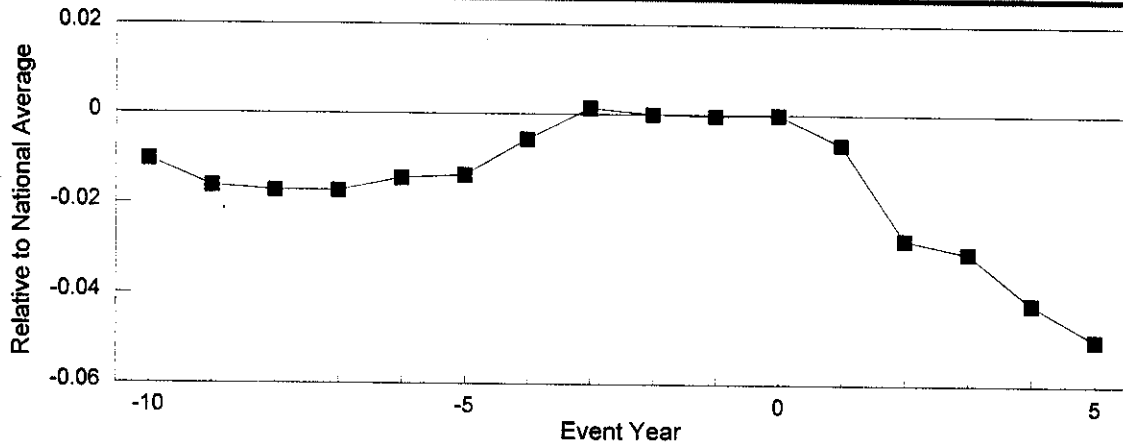Chart 4

Table 6: Marginal Effects from a Probit Model of the Influence of Political Economy Factors on the House Vote on the Wylie-Neal Amendment to Permit Interstate Bank Branching, November 14, 1991.

The dependent variable is one if the legislator votes for the amendment and zero if against. The reported coefficients are the effects of a unit change of the independent variable (from the mean) on the probability of voting in favor of the amendment. All variables are measured by state. N=418, the number of Representatives voting on the amendment. Small bank asset share is the percent of banking assets in the state held by banks below the median size of bank in each state in each year. Relative capital ratio is the capital to assets ratio of small banks minus that of large banks. Size of insurance relative to banking plus insurance in the state is measured as gross state product from insurance divided by gross state product from insurance plus banking. Indicator is 1 if state law permits banks to enter the insurance business and 0 otherwise. Interaction is the product of (insurance's share) * (indicator that banks can sell insurance). Small firm share is the percent of all establishments in the state that have few than 20 employees. The unit banking indicator equals 1 for CO, AR, FL, IL, IA, KS, MN, MO, MT, NE, ND, OK, TX, WI, WV, and WY. Average interest rate on bank loans equals total interest income on all domestic loans made by banks in the state divided by total loans. We also include three indicators for three broad regions in column (3). Robust standard errors in parentheses. ***, **, * denote statistically significant at the 1, 5, and 10 percent levels.

|	(1)	(2)	(3)	(4)
Small bank asset share of all banking assets in state	-4.17*** (1.24)	-4.43*** (1.47)	-4.81*** (1.47)	-5.22*** (1.48)
Capital ratio of small banks relative to large in the state	1.80 (3.75)	1.69 (3.78)	2.49 (4.22)	2.55 (3.42)
Size of insurance relative to banking in the state	1.80*** (0.66)	1.73*** (0.66)	2.00** (0.87)	2.39*** (0.69)
Indicator is 1 if banks can enter insurance business in the state	0.79*** (0.06)	0.70*** (0.06)	0.67** (0.07)	0.76*** (0.06)
Interaction (size of insurance*indicator)	-4.14*** (1.13)	-4.22*** (1.10)	-3.50*** (1.27)	-5.37*** (1.29)
Small firm share of the number of firms in the state	-1.23 (0.92)	-1.32 (0.95)	-0.99 (1.14)	-0.98 (0.89)
Indicator is 1 if state has unit banking law	-	0.04 (0.07)	-0.01 (0.08)	0.09 (0.07)
Average interest rate on bank loans in the state	-	-	-	11.57** (5.34)
Indicator is 1 if Democrat	-0.35*** (0.07)	-0.35*** (0.07)	-0.36*** (0.07)	-0.35*** (0.07)
Includes regional indicators?	No	No	Yes	No
Pseudo-R^2	0.17	0.17	0.18	0.18
Log likelihood	-240.24	-240.13	-238.18	-237.69
p-value of chi^2 for regression	<0.01	<0.01	<0.01	<0.01

Insurance/(Insurance+Banking) where Banks Compete

Chart 5

Average Yield on Domestic Bank Loans

Chart 6
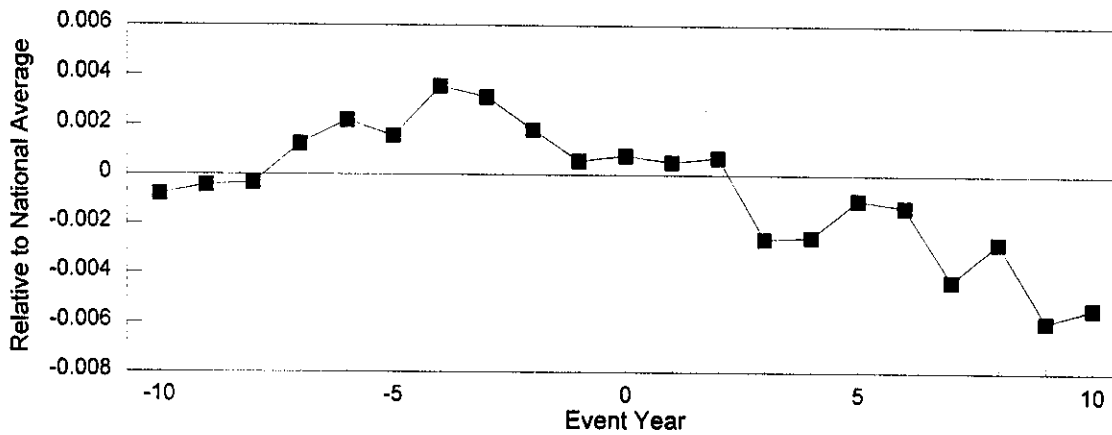
Appendix I: Hazard Model of Political Economy Factors Affecting the Timing of State Branching Deregulation, 1970-1991: Weibull vs. Cox Proportional Hazards Model

Time to branching deregulation is the dependent variable. Column 1 reports coefficients in the log relative hazard form for the Cox model,

$$h(t) = h_0(t)exp\{b_1 x_{1t} + ... + b_k x_{kt}\}.$$

Column 2 reports the coefficients in the log relative hazard form for the Weibull model,

$$h(t) = h_0(t)exp\{b_0 + b_1 x_{1t} + ... + b_k x_{kt}\}$$

where $h_0(t) = pt^{p-1}$ and p is the shape parameter that will be estimated from the data. All variables are measured for each state in each year. Small bank asset share is the percent of banking assets in the state held by banks below the median size of bank in each state in each year. Relative capital ratio is the capital to assets ratio of small banks minus that of large banks. Size of insurance relative to banking plus insurance in the state is measured as gross state product from insurance divided by gross state product from insurance plus banking. Indicator is 1 if state law permits banks to enter the insurance business and 0 otherwise. Interaction is the product of (insurance's share) * (indicator that banks can sell insurance). Small firm share is the percent of all establishments in the state that have few than 20 employees. Robust standard errors in parentheses. ***, **, * denote statistically significant at the 1, 5, and 10 percent levels.

	(1) Cox Model	(2) Weibull Model
Small bank asset share of all banking assets in state	-26.88*** (4.47)	-25.21*** (3.82)
Capital ratio of small banks relative to large in the state	-50.35*** (10.40)	-50.51*** (10.58)
Size of insurance relative to banking in the state	2.59 (1.82)	3.43* (1.88)
Indicator is 1 if banks can enter insurance business in the state	6.51** (3.18)	4.84 (3.07)
Interaction (size of insurance*indicator)	-17.24** (6.99)	-13.51** (6.84)
Small firm share of the number of firms in the state	35.67*** (8.91)	44.89*** (8.94)
N	637	637
Log likelihood	-93.98	-5.70
p-value of chi² for regression	<0.01	<0.01

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