NBER WORKING PAPER SERIES

WHAT DRIVES DEREGULATION? ECONOMICS AND POLITICS OF THE RELAXATION OF BANK BRANCHING RESTRICTIONS

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Working Paper 6637
http://www.nber.org/papers/w6637

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
July 1998

Comments welcome. We thank Rebecca Demsetz, Anil Kashyap, George Kaufman, Lawrence Kenny, David Marshall, Wally Mullin, Sam Peltzman, Raghuram Rajan, Joel Waldfogel, and summer participants at the University of Chicago, American Law and Economics Association, and NBER Summer Institute for helpful comments. Kroszner would like the that the George J. Stigler Center for the Study of the Economy and the State for research support. The views expressed here are strictly those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System. Any opinions expressed are those of the author and not those of the National Bureau of Economic Research.

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NBER Working Paper No. 6637
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JEL No. D78, G21, G28, L51

ABSTRACT

This paper examines the key forces behind deregulation in order to assess the relative importance of alternative theories of regulatory entry and exit. We focus on bank branching deregulation across the states which began a quarter century ago and culminated in federal deregulation in 1994. The cross-sectional and time-series variation of branching deregulation allows us to develop a hazard model to explain the timing of deregulation across the states using proxies motivated by private-interest, public-interest, and political-institutional theories. While some of our findings are consistent with both the private and public interest theories, the public interest approach cannot easily explain our findings that deregulation occurs later in states with relatively more small banks and with a relatively large insurance sector in states where banks can sell insurance. We also find that the ex post consequences of deregulation for the different interest groups are consistent with the ex ante lobbying patterns we infer from the hazard model. Some political-institutional factors also play a role in the process of regulatory change. The same forces that explain the timing of deregulation across the states also explain the pattern of voting in Congress on interstate branching deregulation. We conclude by considering the implications of our results for the future path of deregulation and applications of our research design to other episodes of regulatory entry and exit.

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I. Introduction

One of the key challenges for a positive theory of regulation has been to develop convincing explanations not only of the origins of regulation but also of deregulation. The economic theory of regulation, 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., Olson 1965, Stigler 1971, Peltzman 1976 and 1989, 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] Other approaches emphasize the importance of beliefs and ideology (e.g., Poole and Rosenthal 1997) and the institutional arrangements of the decision-making process (e.g., North 1990, Dixit 1996, and Kroszner and Irwin 1998).

Little consensus exists on what have been the key factors driving the movement toward deregulation during the last quarter century. While the economic theory has had much success in explaining a wide variety of regulatory interventions that are difficult to rationalize on public interest or other grounds (see Stigler 1988), it has been much less effective in explaining the removal of such regulations (e.g., Peltzman 1989 and Noll 1989). An approach emphasizing the

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

role of the public interest, for example, could account for welfare-enhancing deregulation but not the origin of regulations that reduced competition while providing little, if any, welfare improvement.

This paper examines what have been the key factors driving deregulation in order to assess the relative importance of alternative theories of regulatory entry and exit. We focus on the elimination of restrictions on bank branching since the 1970s, reversing policies that in many cases had been in place for more than a century. Unlike most other recent episodes of deregulation -- such as in railroads, trucking, airlines, long-distance telecommunications, securities brokerage, petroleum, and natural gas -- where the reform has taken place at the national level, bank branching regulation operated on a state-by-state basis and deregulation has taken place gradually across the states. Branching deregulation thus provides a much greater source of cross-sectional and time-series variation than other types of deregulation.

The richness of the data allows us to develop an innovative research design to investigate what drives deregulation. We construct a hazard model to understand what factors explain the timing of intrastate branching deregulation. The hazard model permits us to incorporate proxies for interest-group, public-interest, and political-institutional factors to understand how changes in these variables over time and across states affect the likelihood of deregulation. An additional benefit of focusing on branching deregulation is that the state-by-state reform culminates in the passage of the 1994 Riegle-Neal Interstate Banking and Branching Efficiency Act (IBBEA) which effectively eliminated branching restrictions nation-wide. This allows us to determine whether the factors that drive deregulation in the states over time also can explain congressional voting on federal repeal of interstate branching restrictions at the end of the period.

The next section provides a brief overview of the origins and demise of the anti-branching regulations (see Kroszner 1997). In Section III, we describe the empirical proxies we develop motivated by the alternative theories and link them to how the private interest, public interest, and political/institutional approaches would predict they affect the timing of deregulation.

Section IV then explains the research design and the results. The estimates from the hazard model suggest that interest group factors related to the relative strength of potential winners and losers from deregulation play a key role in explaining the timing of branching deregulation across the states. 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. Using a probit model, we can explain the voting pattern of legislators in the U.S. House of Representatives on interstate banking deregulation with the same interest group factors we identified in the hazard model. Section V then discusses generally why branching deregulation began in the 1970s by describing a series of technological, legal, and financial innovations that disturbed the old anti-branching political-economy equilibrium. Our paper provides one of the first systematic accounts of deregulation using the economic or private interest approach.[2] We conclude by discussing other further applications of our research design to study alternative theories of regulatory entry and exit, and we draw implications about the future of financial deregulation.

[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).

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 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.[3] 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.[4]

In addition to excluding banks from other states, the legislatures often restricted intra-state

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[3] 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).

[4] 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).

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.[5] By adopting branching restrictions, the states were able to create a 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 and Peltzman, 1976).

B. A Brief History of Recent Branching Deregulation

Prior to the 1970s, most states had laws restricting within-state branching and all states forbade interstate branching (Table 1 and Chart 1). Although there had been some changes in state branching laws during the late nineteenth and early twentieth centuries, these laws remained stable since the Great Depression. Many of the statutes were essentially unchanged for more than a century. Since the early 1970s, however, all but one of these states have relaxed restrictions on intrastate branching.

Deregulation of these restrictions typically involves three types of reforms. The first relates to allowing multi-bank holding companies (MBHCs) to form in a state. An MBHC could own and operate multiple bank subsidiaries, but each bank was treated as a separate institution. The offices of these banks could not be integrated into one network, so a depositor at one of the banks in an MBHC would not have access to her deposits at another. In addition, the banks in an

[5] 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.

MBHC could not consolidate their back-office operations. Each bank had to meet all regulatory obligations, e.g., capital requirements, as if it were a stand-alone institution.

The second and most important step toward intrastate branching occurs when states permit MBHCs to convert subsidiary banks (existing or acquired) into branches of a single bank. An MBHC could then create an integrated branch network from the banking offices it already owned as well as by purchasing other banks (or the branches of other banks) in the state. A third reform occurs when states permit full state-wide branching, whereby banks could open new branches anywhere within state borders.[6]

Restrictions on full-service expansion by banks and bank holding companies across state also began to fall during the 1970s (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.[7] 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 and thrifts to be acquired by any bank 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

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[6] Permitting branching only through merger and acquisition before full state-wide branching could be interpreted as states allowing incumbent banks to maintain the ability to extract at least a portion of the rents associated with barriers to entry from purchasing banks.

[7] The Bank Holding Company Act, however, grandfathered nineteen existing multi-state holding companies.

could be bought by any other state in the arrangement. Between 1984 and 1988, 38 states joined one of these arrangements (see Amel 1993). Table 1 and Chart 1 illustrate the history of state deregulation of geographical restrictions since 1970.

The state-by-state deregulation culminates in the phase out of interstate banking restrictions with the passage of the 1994 Riegle-Neal Interstate Banking and Branching Efficiency Act, which effectively codified at the national level what had been occurring during the previous two decades at the state level. 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.[8]

III. Data and Hypotheses

As noted above, the cross-sectional and time-series variation in branching deregulation provides an unusually rich data set with which to investigate alternative theories of deregulation. Our empirical work models the timing of intrastate branching deregulation through merger and acquisition. We choose to focus on this form of branching deregulation because it has a much greater economic impact than the other forms of branching deregulation (see Appendix I). Deregulation through merger and acquisition is the only type of branching deregulation that consistently has a statistically significant effect on measures of banking structure, bank efficiency, and overall economic growth in the state. As Appendix I shows, the estimated magnitude of the

[8] The Riegle-Neal Act permits interstate expansion through merger and acquisition but states must pass "opt in" provisions if they wish to permit *de novo* branching by banks from other states.

effect is greater for this type of deregulation than for the other types. In addition, intrastate branching deregulation through merger and acquisition has less time clustering than the other forms of deregulation, making it more amenable to a hazard analysis (see Table 1).

A reason for applying the hazard model to intrastate rather than interstate deregulation is that 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 potential bidders (Brickley and James 1987). 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.

We now turn to the roles that different factors play in driving deregulation. The methods we describe in Section IV will allow us to assess the relative importance of each factor in speeding or slowing deregulation. Some of the variables we consider will help us to distinguish between a public and private interest approach, while others will be consistent with both approaches. The political-institutional approach has little overlap in its implications with the other theories. We will therefore include these factors to measure their effect relative to the proxies for the other forces. Our hypotheses will relate the timing of and support for reforms across the states to the proxies we describe below.

First, consider differences within the industry. Historically, small banks have fought to maintain and extend branching restrictions (White 1983, Abrams and Settle 1993, Hubbard et al.

1996).[9] Smaller banks appear to have been the main winners from anti-branching laws since these restrictions protect them from competition from larger and more efficient banking organizations (for modern evidence on this point, see Jayaratne and Strahan 1998 and Winston 1993). Branching regulation thus tends to reduce the efficiency and consumer convenience of the banking system. The economic theory emphasizes how different interest groups can provide money and votes to politicians who, in turn, control regulatory entry and exit. The economic theory would thus predict that reform should occur later in those states where the strength of the small banks relative to that of the large banks is greater. The public interest theory, however, would imply that deregulation should take place earlier where the share of small banks is large because the social costs of the regulation is directly related to the size of the protected sector.

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 the relative size results reported below are not sensitive to which definition we use.[10] Annual data on bank size are from the fourth quarter *Reports of Income and*

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[9] 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).

[10] 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 yield the

Conditions ("Call Reports") from the Federal Reserve Board.

Another 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, but this variable may not help to differentiate between the public and private interest theories. Under the private interest theory, as small bank performance declines, politicians expect that the future stream of contributions from small banks will fall. Politicians thus will be more likely to abandon the small banks and support deregulation favored by the relatively healthier large banks. As small bank performance declines, however, the risk of failure and bailout increases, thereby increasing the costliness of maintaining the anti-branching statutes. The public interest theory thus also predicts that deregulation becomes more likely when small banks become less healthy. Annual data on bank capital are from the Call Reports.

Second, consider differences between the regulated industry and rival producers that are not directly subject to the regulation but are indirectly affected because they produce services that are substitutes for those produced by the regulated industry. A number of states permit state-chartered commercial banks to sell insurance. In those states, under the economic theory, the insurance lobby would be particularly concerned about the relaxation of branching restrictions because such deregulation might permit banks to provide a more efficient insurance distribution network that might outcompete the insurance agents. The economic theory would therefore predict that reform should occur later in states where banks can sell insurance and the insurance

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same results on the importance of intra-industry differences.

industry is important relative to the banking industry. Under the public interest theory, however, the efficiency costs of the branching restrictions rise with the size of the insurance sector. The public interest theory thus would predict that reform should occur earlier where banks can sell insurance and the insurance industry is relatively large.

To measure this effect we first construct an indicator variable that is 1 if the state permits banks to sell insurance.[11] For each state, we then measure the size of the insurance sector (total value added in the state) relative to the sum of the banking plus insurance sectors. We will examine the effect separately for states that permit banks to sell insurance and those that do not. Data on value-added by industry are from U.S. Commerce Department, Bureau of Economic Analysis, *Survey of Current Business* (August 1994).[12]

Third, consider users of the banking system. 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 (1998) find that after branching deregulation, more efficient banks expand at the expense of less efficient banks, leading to lower loan prices. Moreover, Strahan and Weston (forthcoming) find that lending to small businesses increases on average when small banks are purchased by other banking organizations, and Berger et al. (1998)

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[11] 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.

[12] We also develop another measure of the relative importance of insurance which is share of total value added for the insurance sector in the state as whole. We will discuss this more below.

find that credit availability to small businesses increases in the years following a takeover of a small bank by a larger banking organization. Since bank borrowers tend to benefit from branching deregulation in particular and bank consolidation in general,[13] the economic theory would predict that states with numerous small, bank-dependent firms would deregulate earlier. This prediction, however, also is consistent with the public interest theory since the social costs of the restrictions are higher in states with more small, bank-dependent firms. 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.[14]

Another effect of branching restrictions on bank customers can be related to the prices paid for bank services. High loan prices before deregulation, for example, may reflect a large market share for inefficient, high-cost banks or high rents being earned by the banks protected from competition. In either case, the public interest theory would suggest that states with relatively high initial loan interest rates should deregulate earlier. The economic theory, however, does not have a clear implication about the effect of initial prices on the timing of deregulation: High rents could lead the beneficiaries to fight harder to maintain them (e.g., Stigler 1971) or the deadweight costs associated with these high rents could make it more difficult for the beneficiaries to maintain the restrictions (e.g., Becker 1983). We use the difference between the

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[13] On the other hand, local banking monopolies created by branching restrictions could strengthen relationships between banks and small and medium sized firms and increase the availability of credit to these firms (Petersen and Rajan 1994). Also, some have argued that small business lending declines when large banks take over small banks (e.g., Berger, Kashyap, Scalise 1995).

[14] 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.

average interest rate on loans in the state and the prevailing federal funds rate as a measure of prices, where the loan rate equals the ratio of total interest income on all domestic loans divided by total domestic loans held by banks operating in the state.[15] These data are from the end-of-year Call Reports but become available beginning only in 1976.[16]

Fourth, consider the effect of stability and soundness of the banking sector on 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 of regulation would 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 because unstable banks are less likely to survive to reap the benefits of the restrictions (Gunther 1994, 1996). Also, deregulation can arise as a response to banking instability under a theory of ignorant or misinformed voters, in which a banking crisis acts as an educational device to make the previously ignorant public aware of the

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[15] A measure of how individual customers would be affected is interest rates they receive on deposits. We calculated the average deposit interest rate in the state from the end-of-year Call Reports and did not find any relationship between this variable and the timing of deregulation in our analysis below. Since Jayaratne and Strahan (1998) find that branching deregulation has no effect on deposit rates, our finding of no relationship between timing and rates result could be due to either individual bank customers anticipating little pricing effect and not lobbying or an inability of individual depositors to form an effective lobby.

[16] 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.

costs of the anti-branching policy (see Kane 1996). Our proxy for bank instability is the failure rate of banks, measured as the percent of total state banking assets in failed institutions from the Federal Reserve Board's *National Information Center* database.[17]

Finally, consider the political side of political economy and emphasize legislative structures, party politics, and ideology (see, e.g., Poole and Rosenthal 1997, Matsusaka and Kahn 1997, and Irwin and Kroszner 1998). Republicans, for instance, are typically perceived as more likely to favor deregulation than Democrats. In addition, one party may be more likely to achieve reform when it controls the legislature and the governorship.

While the views of the politicians may simply reflect the economic interests of the constituents in the state (see Peltzman 1984), we include two political variables to adjust for any independent influence of party politics. First, we measure the degree of party control of the state government by the fraction of the three bodies of the state government (the assembly, senate and governorship) controlled by Democrats. This variable, for example, is one-third if the Democrats have a majority in the assembly and the Republicans have a majority in the senate and hold the governorship. Second, we include an indicator variable equal to one if the same party controls the governor's office and has majorities in both chambers of the state legislature.[18]

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[17] As alternative measures of distress, we used (a) the bank failure rate, measured as the number of failed institutions in the state relative to the total number of banks, (b) the overall capital-to-asset ratio of all banks in the state, and (c) the growth in state personal income. Our results are not sensitive to the choice of distress proxy.

[18] We also estimated the models with three indicator variables to reflect the party control of the assembly, senate and governorship separately. The coefficient estimates on these variables are qualitatively similar to those we present below (that is, Democratic control tends to slow deregulation) and the results on the interest group variables are unaffected by the specification of the political variables. Note also that Nebraska has a non-partisan, unicameral legislature. We assume that the party of the Governor controls the state government for Nebraska and set the unified government indicator to one.

IV. Methods and Results

First, we develop a hazard model to determine how the factors described above influence of the political economy factors on the pattern of intrastate branching deregulation across the states. Second, we examine how our variables change in "event time" with the event being the year of deregulation. By analyzing how these factors vary before and after deregulation, we can determine the impact of regulation and deregulation on the different interest groups is consistent with our interpretation of the coefficients of the hazard model. Finally, we investigate federal interstate branching deregulation with a probit model to explore whether the factors that affect the timing of intrastate deregulation also influence voting in the House of Representatives on interstate deregulation.

A. 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. If during our time period shocks continue to arrive which increasingly undermine support for branching restrictions, the hazard function for branching deregulation should show positive duration dependence, that is, the hazard rate should be rising over time. The

Kaplan-Meier product-limit estimator provides a simple, non-parametric way to estimate the shape of the hazard function over time (see Greene 1997).[19] Chart 2 graphs this estimate for our data and shows that the hazard function is relatively flat in the early years and then grows steeper in the later years. In section V, we will describe common shocks across states that would lead us to predict an upward sloping hazard function for branching deregulation.

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

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

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 2 reports summary statistics and correlation coefficients for the explanatory variables we use in our analysis.

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

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[19] 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. In other words, the hazard rate is the ratio of the number of states that actually deregulate in each year to the number of states that have not yet deregulated in that year.

covariates.[20] 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: $\ln(T) = b^*x + e$.[21] 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.

In Table 3, we report the b_i^* coefficients. Our analysis includes the 36 states which deregulate during the 1970 to 1992 sample period. We also include three states which do not deregulate during our sample period (Arkansas, Minnesota and Iowa), but our results are not

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[20] 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 II). Imposing a Weibull model, thus, does not appear to distort our estimates.

[21] 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).

sensitive to the inclusion of these censored observations. Since we observe each state in each year up to and including the year of deregulation, we have a total of 637 observations. States that allowed branching deregulation before 1970 are not included in the hazard model.

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 30 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 4.7 (5.2) years. Relative strength of conflicting interests within the industry appear to play an important role in the process of regulatory change, and our results would support the economic theory over the public interest theory of the motives for deregulation.

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.[22] A one standard deviation increase in the relative capital-to-asset ratio results in a 15 percent rise in the time until deregulation, which translates into an increase of 2.4 (2.6) years from the mean (median). These results are consistent with an important role for interest group strength within the industry to affect the timing of the regulatory exit but, as noted above, also could be consistent with a public interest interpretation.

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[22] We also allowed small bank and large bank capital-to-asset ratios to enter separately. Their coefficient estimates were nearly equal in absolute value and of opposite signs, and so the data does not reject the relative small to large bank capital ratio specification we have chosen.

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 plus insurance 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 22 percent increase in the time until deregulation, which at the mean (median) is 3.5 (3.8) years.[23] This result suggests that inter-industry competition is relevant to the timing of deregulation since insurance interests appear to have slowed deregulation in states where they are rivals, consistent with the economic theory and not the public interest theory.[24]

Turning to the role of users of banking services, we find that a greater share of small firms in the state tends to hasten the timing of the deregulation. 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 18 percent, which speeds deregulation by about three years. Earlier deregulation where small, bank-dependent firms are relatively numerous is consistent with both the economic theory (small firms prefer more competition in local banking markets and lobby to that end) and the public interest approach

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[23] We have also estimated the model with the indicator variable equal to one for states where banks may sell insurance but without the variables measuring the importance of insurance relative to banking. In this model, the coefficient on the insurance indicator variable -- an estimate of the difference in the expected time to deregulation in states where banks may sell insurance, relative to states where banks may not sell insurance -- equals 0.27 and is statistically significant at the 5 percent level. This suggests that branching deregulation takes about 4.5 years longer in states where banks may sell insurance.

[24] When we use the relative size of the insurance sector in the state as a whole rather than insurance relative to banking plus insurance in the state, we obtain similar results. When we simultaneously include both measures of the relative size of insurance, the interactions of the "insurance relative to banking plus insurance" variable continue to be statistically significant but the interactions of "insurance relative to the state as a whole" variable are not.

(burden of the regulation is related to the number of small firms).[25]

Column (2) of Table 3 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 small and not statistically significant. As noted above, the public interest theory would imply that the coefficient should be negative, while the implications of the economic theory are ambiguous for this variable.

To check for an association between banking problems and the timing of deregulation, we included the failure rate of banks, measured as the percent of total state banking assets in failed institutions (column 3). The coefficient is small and statistically insignificant but has a positive sign, suggesting that, if there is any effect, deregulation is delayed in states with unstable banking systems.[26] The inclusion of the failure rate does not affect the other results. We thus do not find a linkage between the timing of state deregulation and state-wide banking distress. 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 do not appear to have any

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[25] 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.

[26] As noted above we used three alternative measures of distress. Their coefficient estimates were small and statistically insignificant, and their inclusion did not change any of the other results.

effect in the hazard model but the general timing of deregulation occurs just as bank instability increases (see section V below).

Finally, the partisan structure of the state government does appear to influence when states deregulate. As expected, a higher proportion of Democrats in the government tends to delay deregulation. A one standard deviation rise in the share of the government controlled by Democrats slows the deregulation by about two years. Whether the state is dominated by one party, however, does not appear to affect the timing of the deregulation.[27]

To examine the robustness of the results, we first explore whether the initial type of branching regulation within the state had any effect on the pattern of deregulation. Different states had different degrees of restrictions on bank expansion at the start of our sample period. This initial condition may proxy for omitted factors determining the political-economy equilibrium in the state that could then affect the subsequent timing of deregulation.

First, 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.[28] Column (4) of Table 3 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 years later, all else equal. As column (4) shows, however, the other results are virtually

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[27]Also, we tried including a variable that is one if control of the legislature/governorship changes. These variables did not have an economically or statistically significant effect and did not affect any of the other results.

[28] We classify states that prohibited branching but permitted banks to establish facilities as unit banking states. The unit banking indicator is one for the following states: CO, AR, FL, IL, IA, KS, MN, MO, MT, NE, ND, OK, TX, WI, WV, and WY.

unchanged when the unit banking indicator is included. 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 = 12.9, distributed chi-square (8) 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.

Second, we include an indicator variable that is one if the state permitted multi-bank holding companies (MBHCs) to exist at the beginning of our sample period. Thirty-four states began the period allowing MBHCs. The coefficient estimate for this indicator variable (not reported) is small and not statistically significant, and its inclusion does not change the effects of the other variables. A likelihood ratio test of whether the MBHC states could be pooled with the other states could not reject pooling of the data (LRT = 10.1, distributed chi-square (8) under the null hypothesis). States permitting MBHCs initially do not appear to be different from other states in our hazard model.

As a final robustness check, we divide the country into four regions — North, South, Midwest, and West — to determine whether any region-specific clustering is driving our results.[29] The inclusion of the regional indicators in column (5) has little impact on small bank share, the relative capital-to-assets ratio, and small firm share. Although the coefficient estimate still

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[29] 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.

implies that in states where banks can sell insurance that a larger relative size of the insurance sector delays deregulation, the magnitude of the effect falls by half and is no longer statistically significant. While the inclusion of the regional indicators does no affect the other results, the results on insurance do appear to be sensitive to the specification of the hazard model.[30]

To summarize our findings from the hazard model, private interests appear to play an important role in the deregulatory process. While private interests and public interests do sometimes coincide, the results on the relative share of small and large banks as well as the results on the insurance variables are consistent with a private interest approach but are difficult to explain through the public interest.

B. Event Time Graphs

We now examine the impact of deregulation on different interest groups to help to determine what lobbying patterns are appropriate to infer from the hazard results. To do so, we construct an event time index relative to the date at which branching deregulation goes into effect. 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.[31]

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[30] As further robustness check, 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.

[31] Our graphs present data until year +5 due to relatively few observations for some of the variables beyond this date.

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 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 it ex ante. 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 (see Jayarante and Strahan 1998).

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. 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, relative to the federal funds rate. 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 support the private interest 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.[33]

C. 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 to explain the individual states' pattern of interstate deregulation, we analyze the voting pattern of members of Congress on interstate deregulation at the federal level. Financial services interests are active contributors and lobbyists in Washington. Their political action committees constitute the single largest group of contributors to legislators, providing nearly 20 percent of total congressional campaign contributions (Makinson 1992), and much of their lobbying effort involves competition among rival interests within financial services (see Kroszner and Stratmann forthcoming and 1998).

As noted above, 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

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[33] To examine whether the changes following deregulation are statistically significant, we regressed each measure on a state fixed-effect, a year fixed-effect, and an indicator variable that is one in all of the years following deregulation and zero otherwise. The coefficient on the deregulation indicator is negative and statistically significant for the small bank share and average loan interest rate variables and positive but not statistically significant for the relative insurance share and relative capital ratio variables.

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 check for the influence of the 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 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 4 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 use a party affiliation indicator variable equal to one for Democrats and zero for Republicans as our proxy for political factors. The

coefficients in Table 4 are the marginal effects ("slopes") of a one unit change of each variable on the probability that a legislator will vote for the amendment.[34] Note that to compare the effects of the variables in the hazard and probit models, a force which favors deregulation has a negative coefficient in Table 3 but would have a positive coefficient in Table 4.

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 interest group influence on a legislator's voting decision. 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 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 also 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.[35] 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. 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

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[34] 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.

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

raises the probability that a legislator will support the amendment by roughly 8 percent. The coefficient estimate for the banking distress variable, measured as the average bank failure rate from 1985 to 1991, is small and statistically insignificant. Overall, the probit analysis of the vote on national branching deregulation supports the economic theory of deregulation and provides a consistency check that the importance of interests operating on the state legislatures are very similar to those operating at the federal level.[36]

V. Why Did Branching Deregulation Begin during the 1970s? Shocks to the Equilibrium Supporting Geographical Restrictions on Banking

A complete explanation of regulatory exit should be able to explain why deregulation begins in the 1970s in addition to the specific timing of the state-by-state reforms. In this section, we explore whether we can identify broad technological, legal, and economic shocks that would alter the political-economy equilibrium which had kept state anti-branching regulations little changed for at least 30 years before the 1970s.

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

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[36] 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 4, except that the levels of statistical significance tend to be lower.

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 5 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 feasible and convenient alternative to local banks.[37] From zero in 1970, Table 5 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, thereby lowering the costs for customers to use distant banks. Since the increasing elasticity of deposits supplied to banks reduces the value of geographical restrictions to their traditional beneficiaries, there are fewer rents available for redistribution and the beneficiaries have less incentive to fight strenuously to maintain them (see Peltzman 1976).

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, a national market developed for residential mortgages in the 1970s. In the 1980s, consumer lending relied increasingly on automated information processing, leading to the development of credit

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[37] 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. The gradual elimination of interest rate ceilings on large denomination certificates of deposit during the 1970s appear to have hurt smaller and retail-oriented banks relative to larger, wholesale banks (see James 1983).

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.[38]

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 thus have had an incentive to increase their lobbying pressure to attain the freedom to expand into these markets. 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. With the deadweight costs of preventing large bank entry rising, under the economic theory, small local banks are less likely to be able to maintain the restrictions (see Becker 1983) and, under the public interest theory, politicians should then be more likely to deregulate.

These factors combined to start undermining the economic performance of the small banks that had benefitted most from the geographic restrictions. Table 5 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 public's awareness of the costliness of having government-insured but (geographically) undiversified financial institutions. In the late 1970s, as Table 5 shows, the failure rate of banks

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[38] 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.*

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 (see Abrams and Settle 1993). As noted above, we did not find any evidence that banking failures or distress in a state affected the speed with which the state deregulated, but distress still may be a common factor affecting all of the states.

These technological, economic, and legal shocks generated conditions that changed the longstanding balance favoring the anti-branching forces. The marginal product of lobbying in favor of repealing branching restrictions increased precisely when the relative value to the small banks of maintaining political support for branching restrictions was declining. These nation-wide shocks are common factors across states, and they are consistent with the positive duration dependence associated with state-level deregulation that we demonstrated in Chart 2.

VI. Conclusions

The recent experience of bank branching deregulation is consistent with the private interest theory of regulatory change. This view emphasizes that regulation involves competition among special interest groups. The beneficiaries of branching deregulation were able to support an equilibrium coalition in favor of geographical restrictions despite their costs to consumers of financial services long after the value of them to governments as a key source of revenue had faded. During the last quarter century, competition among interest groups can explain the demise of both state and federal bank branching restrictions. While some of our results are also

consistent with the public interest theory -- for example, deregulation occurs earlier when small banks are in a relatively weak financial position -- other results, particularly evidence on the importance of rivalries between small and large banks and between banking and insurance, are difficult to explain with the public interest approach. We also find that ideological factors may affect the timing of deregulation, although these variables may act as proxies for unmeasured economic interests in the state.

Ours is perhaps the first study to provide a complete account of deregulation through the economic theory of regulation in any industry and to analyze the process of regulatory exit using a hazard model. The mixed success of this approach in explaining deregulation in other areas may be due to a lack of cross-sectional variation in regulatory change in other industries, rather than a failure of the theory itself. Future empirical work on regulatory exit might then be most fruitful in areas where deregulation has taken place across the states, including some aspects of insurance, franchising, and public utilities (e.g. Joskow 1996).

Technological and financial innovations will continue to erode the benefits to any interest group of maintaining regulatory barriers in financial services. These forces are likely to bring about reforms both domestically, for example, through legislation that would increase bank powers (see Kroszner 1996, Kroszner and Rajan 1994 and 1997, and Kroszner and Stratmann 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: Year of Deregulation of Restrictions on Geographical Expansion, by State.

State	Intrastate Branching through M&A	Full Intrastate Branching Permitted	Interstate Banking Permitted	Multi-Bank Holding Companies Permitted
AL	1981	1990	1987	<1970
AK	<1970	<1970	1982	<1970
AZ	<1970	<1970	1986	<1970
AR	1994	**	1989	1985
CA	<1970	<1970	1987	<1970
CO	1991	**	1988	<1970
CT	1980	1988	1983	<1970
DE	<1970	<1970	1988	<1970
DC	<1970	<1970	1985	<1970
FL	1988	1988	1985	<1970
GA	1983	**	1985	1976
HI	1986	1986	**	<1970
ID	<1970	<1970	1985	<1970
IL	1988	1993	1986	1982
IN	1989	1991	1986	1985
IA	**	**	1991	1984
KS	1987	1990	1992	1985
KY	1990	**	1984	1984
LA	1988	1988	1987	1985
ME	1975	1975	1978	<1970
MD	<1970	<1970	1985	<1970
MA	1984	1984	1983	<1970
MI	1987	1988	1986	1971
MN	1993	**	1986	<1970
MS	1986	1989	1988	1990
MO	1990	1990	1986	<1970
MT	1990	**	1993	<1970
NE	1985	**	1990	1983
NV	<1970	<1970	1985	<1970
NH	1987	1987	1987	<1970
NJ	1977	**	1986	<1970
NM	1991	1991	1989	<1970
NY	1976	1976	1982	1976
NC	<1970	<1970	1985	<1970
ND	1987	**	1991	<1970
OH	1979	1989	1985	<1970
OK	1988	**	1987	1983
OR	1985	1985	1986	<1970
PA	1982	1990	1986	1982
RI	<1970	<1970	1984	<1970
SC	<1970	<1970	1986	<1970
SD	<1970	<1970	1988	<1970
TN	1985	1990	1985	<1970
TX	1988	1988	1987	1970
UT	1981	1981	1984	<1970
VT	1970	1970	1988	<1970
VA	1978	1987	1985	<1970
WA	1985	1985	1987	1981
WV	1987	1987	1988	1982
WI	1990	1990	1987	<1970
WY	1988	**	1987	<1970

*** States not yet deregulated.*
Source: Amel (1993) and updates by authors.

Table 2: Summary Statistics for Variables in Hazard Model, 1970-1992.

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
Relative size of insurance to banking plus insurance 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
Share of state government controlled by Democrats	0.65	0.36	0	1
Indicator is 1 if state controlled by one party	0.54	0.50	0	1
Average yield on bank loans in the state minus fed funds rate	0.02	0.02	-0.04	0.08

Panel B - Correlations	Small Bank	Relative Size of Insurance	Insurance Indicator	Small Firm	Small Bank Capital	Dem. Control	Single Party
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Small bank asset share of all banking assets in state	1						
Relative size of insurance to banking plus insurance 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		
Share of state government controlled by Democrats	-0 06	0.01	-0.18	-0.18	0.05	1	
Indicator is 1 if state controlled by one party	0.07	0.12	0.01	-0.06	-0.06	0.30	1
Average yield on bank loans in the state minus fed funds rate	-0.01	-0.15	0.03	0.22	-0.10	-0.03	-0.06

Note: N = 637, except for the average interest rate on bank loans which becomes available only in 1976, so N=408.

Table 3: Hazard Model of Political Economy Factors Affecting the Timing of State Branching Deregulation, 1970-1992.

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. Insurance indicator is 1 if state law permits banks to enter the insurance business. Small firm share is the percent of all establishments in the state that have fewer than 20 employees. Unit banking indicator equals 1 for states with unit banking restrictions. Party control variable is the share of the three bodies of state government controlled by Democrats. One party control indicator is 1 if the same party control's the governorship and has majorities in both chambers of the state legislature. Average yield on bank loans equals total interest income on all domestic loans made by banks in the state divided by total loans. Bank failure rate is the ratio of assets in failed banks during a given state and year divided by total bank assets in that state and year. We divide the country into four regions and include regional indicators in column (5). Robust standard errors in parentheses. ***, **, * denote statistically significant at the 1, 5, and 10 percent levels.

	(1)	(2)	(3)	(4)	(5)
Small bank asset share of all banking assets in state	6.48***	5.19***	6.32***	5.16***	4.96***
	(1.22)	(1.37)	(1.35)	(1.18)	(0.94)
Capital ratio of small banks relative to large in the state	13.25***	9.21***	13.01***	10.67***	7.03**
	(3.48)	(3.19)	(3.62)	(3.46)	(3.41)
Relative size of insurance in states where banks may not sell insurance, 0 otherwise	-0.93**	-0.90***	-1.02**	-0.93*	-0.14
	(0.43)	(0.33)	(0.51)	(0.48)	(0.28)
Indicator is 1 if banks may sell insurance in the state	0.45***	0.37***	0.45***	0.38***	0.14
	(0.10)	(0.11)	(0.10)	(0.08)	(0.09)
Relative size of insurance in states where banks may sell insurance, 0 otherwise	3.24**	2.59*	3.15*	2.85*	1.19
	(1.61)	(1.49)	(1.65)	(1.54)	(1.30)
Small firm share of the number of firms in the state	-9.72***	-6.14***	-9.52***	-9.43***	-13.24***
	(2.11)	(2.15)	(2.11)	(2.30)	(1.97)
Share of state government controlled by Democrats	0.31**	0.23**	0.30**	0.27**	0.16
	(0.12)	(0.11)	(0.12)	(0.11)	(0.11)
Indicator is 1 if state controlled by one party	-0.04	-0.04	-0.04	-0.01	0.16*
	(0.10)	(0.07)	(0.07)	(0.09)	(0.09)
Average yield on bank loans in the state minus fed funds rate	-	0.23	-	-	-
		(3.19)			
Bank failure rate	-	-	0.92	-	-
			(1.11)		
Indicator is 1 if state has unit banking law	-	-	-	0.18**	0.21***
				(0.10)	(0.06)
Includes regional indicators?	No	No	No	No	Yes
N	637	408	637	637	637
Log likelihood	-3.74	9.00	-3.60	-2.12	8.46
p-value of chi^2 for regression	<0.01	<0.01	<0.01	<0.01	<0.01

Table 4: 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. Small firm share is the percent of all establishments in the state that have fewer than 20 employees. Unit banking indicator equals 1 for states with unit banking restrictions. Party control variable is the share of the three bodies of state government controlled by Democrats. One party control indicator is 1 if the same party control's the governorship and has majorities in both chambers of the state legislature. Average yield on bank loans equals total interest income on all domestic loans made by banks in the state divided by total loans. The average bank failure rate is the ratio of assets in failed banks during a given state divided by total bank assets in that state averaged over the years 1985 to 1991. We divide the country into four regions and include regional indicators in column (5). Robust standard errors in parentheses. ***, **, * denote statistically significant at the 1, 5, and 10 percent levels.

	(1)	(2)	(3)	(4)	(5)
Small bank asset share of all banking assets in state	-4.17*** (1.24)	-4.54*** (1.22)	-4.07*** (1.20)	-4.43*** (1.47)	-4.81*** (1.47)
Capital ratio of small banks relative to large in the state	1.80 (3.75)	2.68 (3.42)	2.56 (3.75)	1.69 (3.78)	2.49 (4.22)
Relative size of insurance in states where banks may not sell insurance, 0 otherwise	1.80*** (0.66)	2.42*** (0.72)	1.54** (0.67)	1.73*** (0.66)	2.00** (0.87)
Indicator is 1 if banks may sell insurance in the state	0.79*** (0.06)	0.74*** (0.06)	0.69*** (0.06)	0.70*** (0.06)	0.67** (0.07)
Relative size of insurance in states where banks may sell insurance, 0 otherwise	-2.34** (1.02)	-2.49** (1.14)	-2.33** (1.01)	-2.49** (1.04)	-1.50 (1.15)
Small firm share of the number of firms in the state	-1.23 (0.92)	-0.83 (0.89)	-1.62 (1.07)	-1.32 (0.95)	-0.99 (1.14)
Indicator is 1 if Representative is a Democrat	-0.35*** (0.07)	-0.35*** (0.07)	-0.36*** (0.07)	-0.35*** (0.07)	-0.36*** (0.07)
Average yield on bank loans in the state minus fed funds rate	-	10.01* (5.15)	-	-	-
Average failure rate, 1985 to 1991	-	-	2.28 (1.41)	-	-
Indicator is 1 if state has unit banking law	-	-	-	0.04 (0.07)	-0.01 (0.08)
Includes regional indicators?	No	No	No	No	Yes
Pseudo-R^2	0.17	0.18	0.17	0.17	0.18
Log likelihood	-240.24	-238.26	-239.51	-240.13	-238.18
p-value of chi^2 for regression	<0.01	<0.01	<0.01	<0.01	<0.01

Table 5: Broad Trends in Commercial Banking, 1950-1995.

Year	Number of ATMs	Domestic Bank Deposits (Billions)	Money Market Mutual Fund (Billions)	Percent of Deposits + Money Funds Held by Banks	Small Banks' Percent of Banking Assets	Average Number of Bank Failures
	(1)	(2)	(3)	(4)	(5)	(6)
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

Notes and Sources:
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.

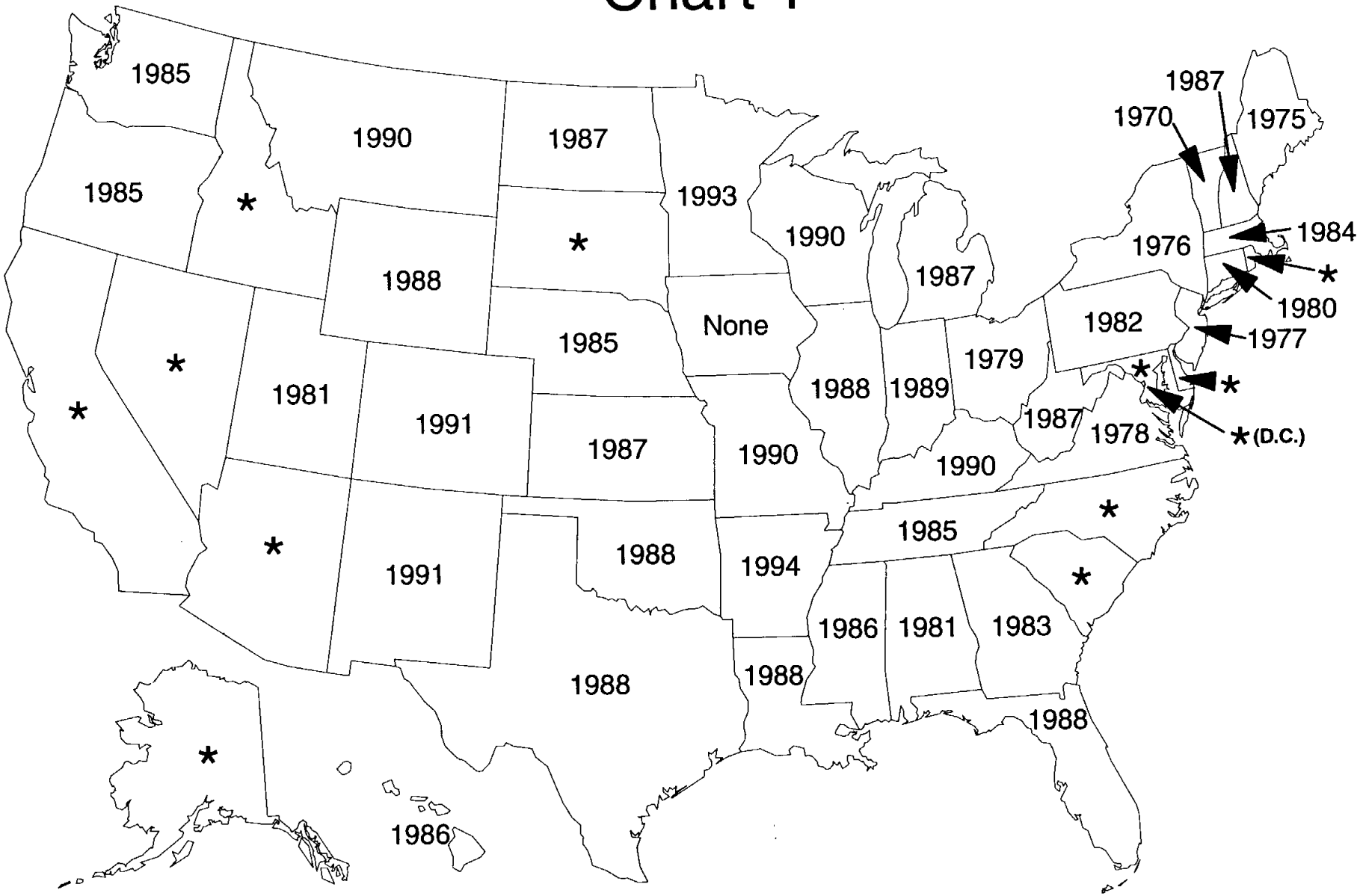
Columns 2-4: Banks domestic deposits are from the Reports of Income and Condition; money market mutual funds are from the Flow of Funds. Data on all bank deposits, foreign plus domestic are only available beginning in 1970. The trend in banks' share (column 4) is the same using total deposits instead 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

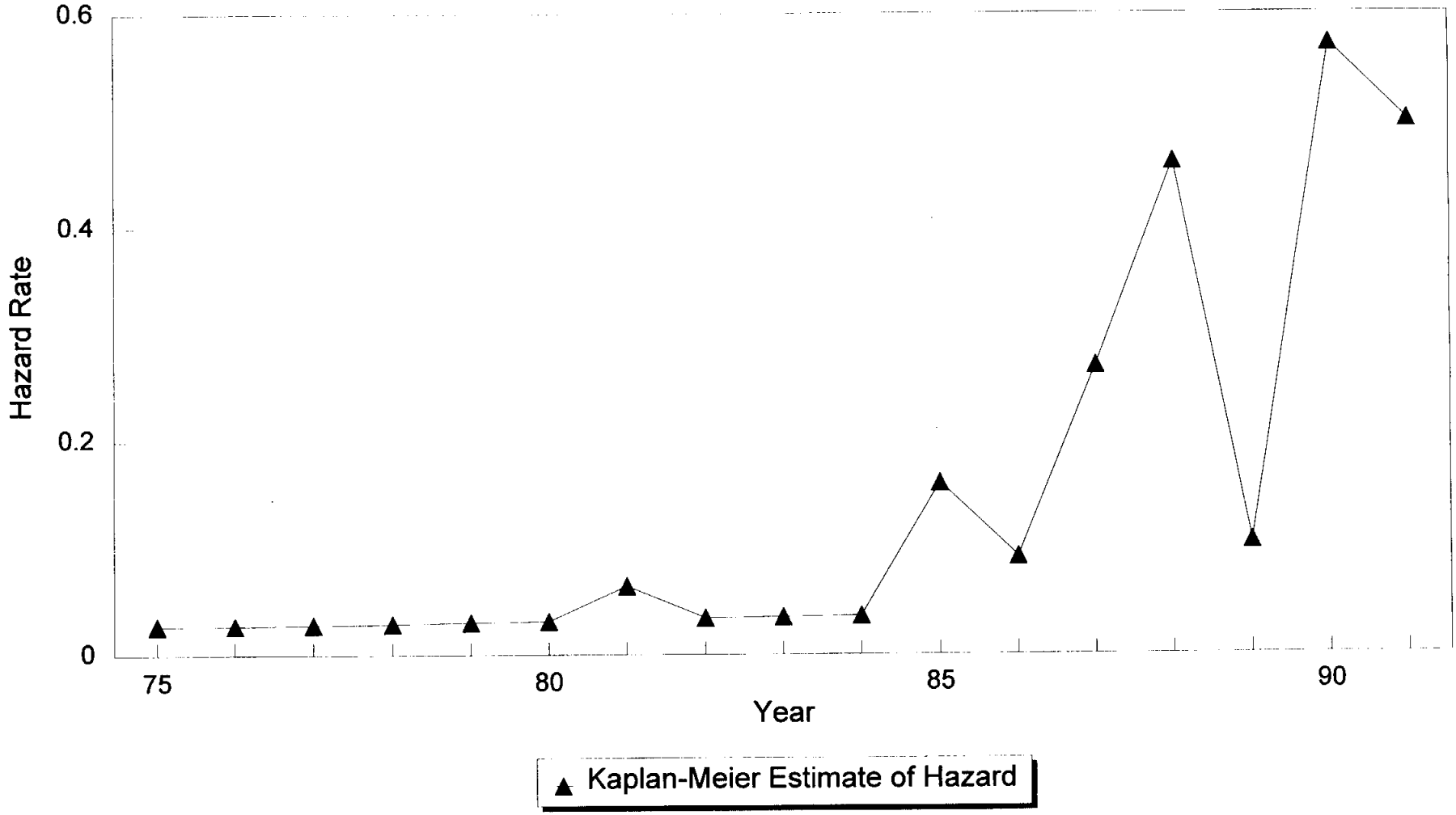
Chart 1

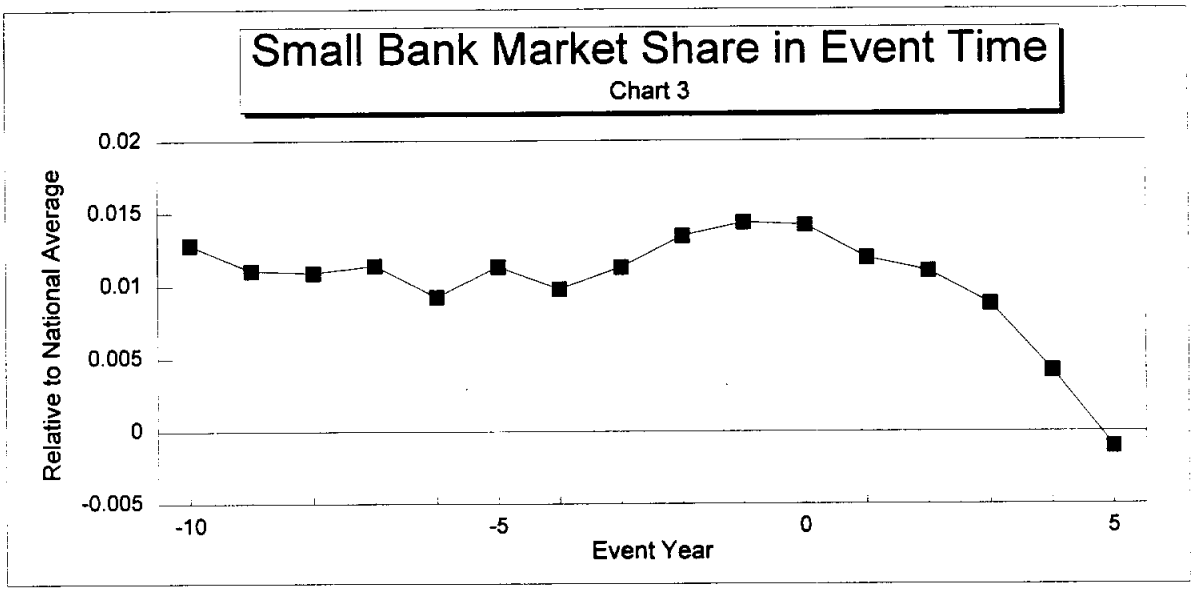


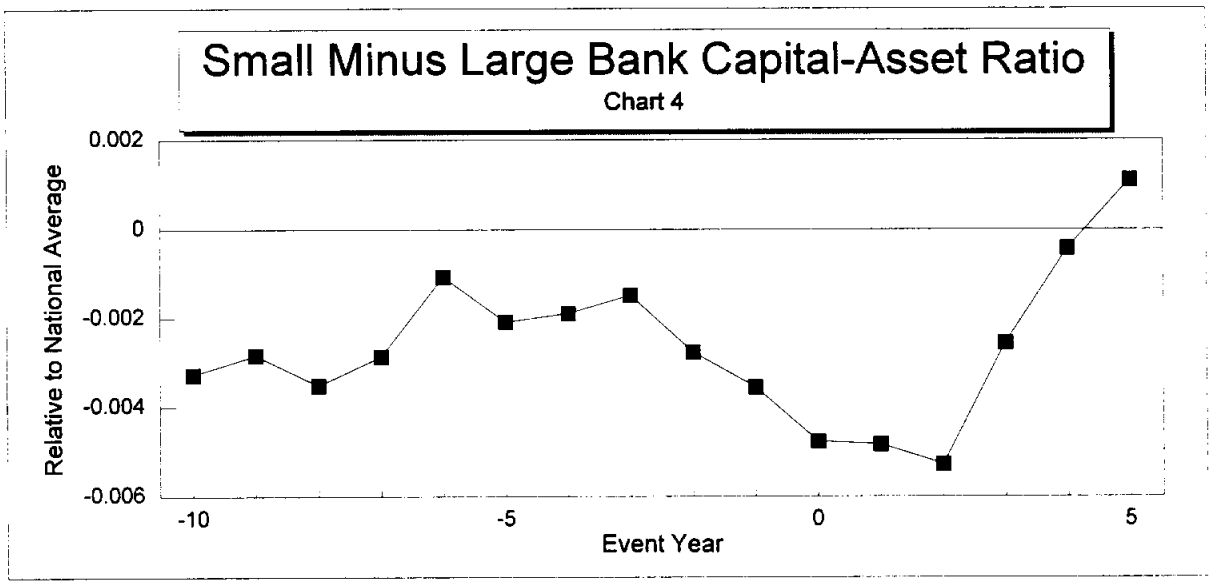
* Permitted Intrastate Branching before 1970

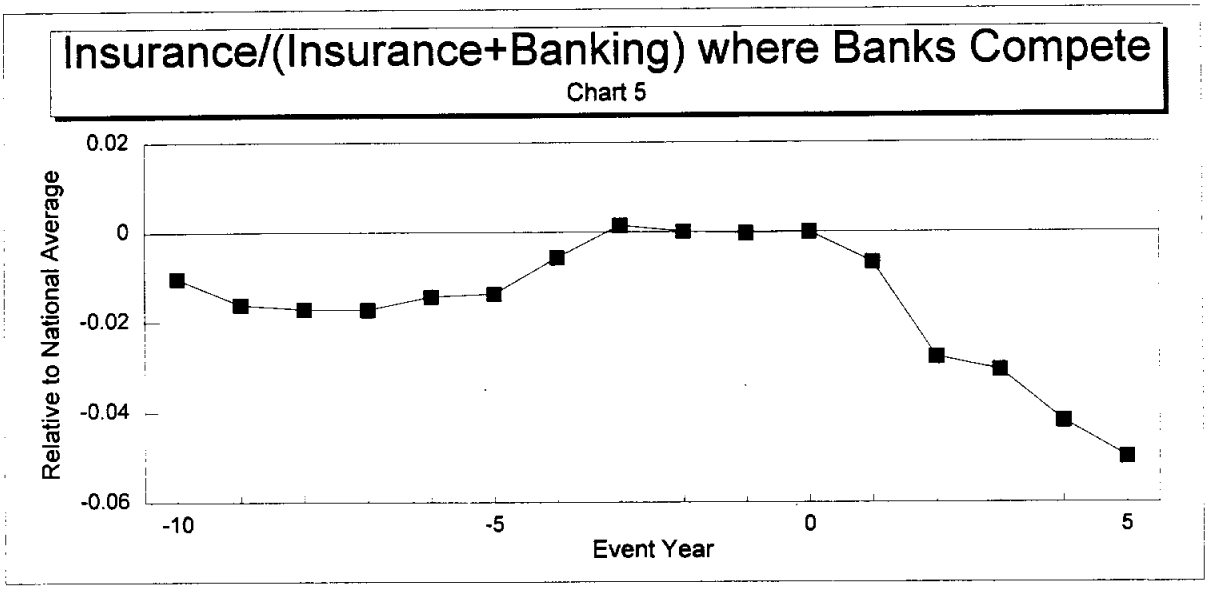
Estimates of Hazard Rate for Branching Deregulation

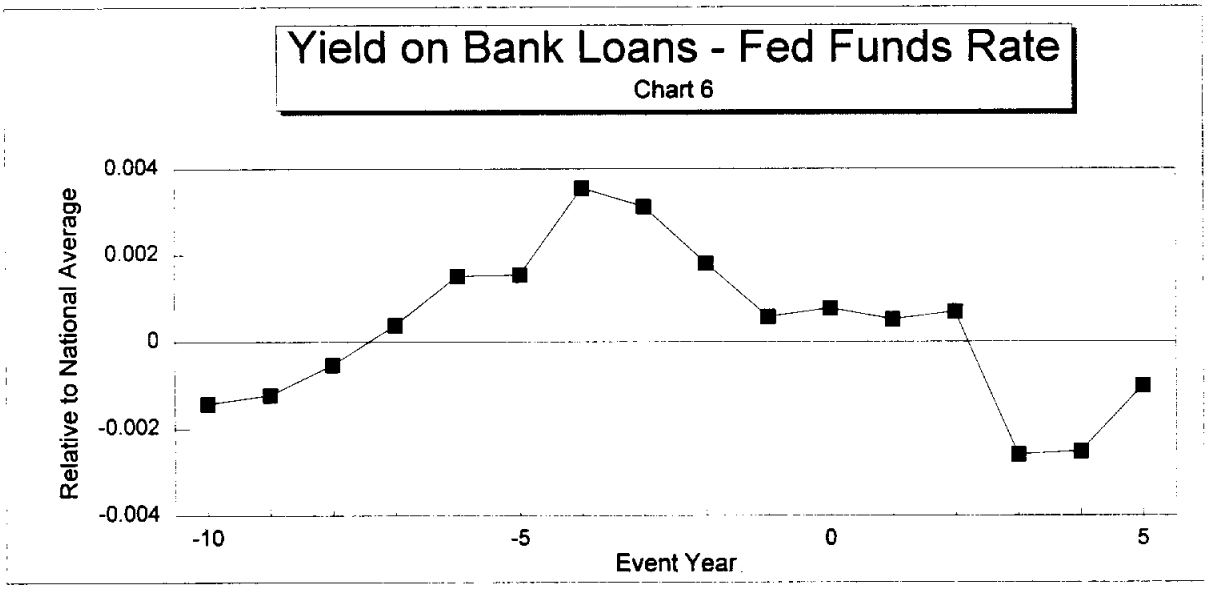
Chart 2




Small Bank Market Share in Event Time
Chart 3
0.02
0.015
0.01
0.005
0
-0.005
Relative to National Average
-10
-5
0
5
Event Year


Small Minus Large Bank Capital-Asset Ratio
Chart 4
0.002
0
-0.002
-0.004
-0.006
Relative to National Average
-10
-5
0
5
Event Year


Insurance/(Insurance+Banking) where Banks Compete
Chart 5
Relative to National Average
0.02
0
-0.02
-0.04
-0.06
-10
-5
0
5
Event Year


Yield on Bank Loans - Fed Funds Rate
Chart 6
Relative to National Average
0.004
0.002
0
-0.002
-0.004
-10
-5
0
5
Event Year

Appendix I: Effects of Different Types of Branching Deregulation on Economic Growth, Banking Structure, and Bank Efficiency

We measure the importance of alternative forms of deregulation by their consequences for the economic growth, and the structure and efficiency of the banking sector across the states (see Jayaratne and Strahan 1996 and 1998). To do so, we run an OLS panel regression relating indicators for each type of deregulation to potential consequences. Our dependent variables include proxies for economic growth (growth in personal income), bank structure (the log of the number of banks, banking companies and branches, the number of branches per bank, and the number of branches per banking company), and efficiency (the log of total non-interest expenses, and the ratio of loan loss provisions to total loans). The four deregulation indicators (MBHC, branching through merger and acquisition, unrestricted statewide branching, and interstate banking) are equal to one in the years after deregulation and zero before. If a state deregulated before the sample period begins in 1970, the indicator is one throughout; if the state does not deregulate, then the indicator is zero throughout. All regressions include state fixed effects and time effects.

Appendix Table IA shows the results of including the set of four deregulation indicators simultaneously. The branching by merger and acquisition indicator is statistically significant and of the expected sign in seven of the eight equations and larger in absolute value than any of the other coefficients on the indicators for the other types of deregulation. Since there may be multicollinearity among our indicators, we include each indicator separately and report these univariate coefficient estimates in Appendix Table IB. Once again, in seven of the eight equations the branching by merger and acquisition indicator is statistically significant and of the expected sign. None of the other deregulation indicators alone is statistically significant in more than three equations and the absolute value of the magnitudes of their coefficient estimates are similar to or smaller than the coefficient on the branching by merger and acquisition deregulation indicator. These results imply that branching by merger and acquisition is the most important type of deregulation measured by its consequences for economic growth, banking structure, and bank efficiency.

Appendix IA: Multivariate Regressions
of the Effects of Different Types of Branching Deregulation on Economic Growth, Banking Structure, and Bank Efficiency

This table contains regressions of state-level economic growth and state-level measures of the structure and efficiency of the banking industry. Each dependent variable is regressed on a set of state indicator variables, a set of year indicator variables, and the set of four deregulation indicators; these deregulation indicators are equal to 1 after deregulation and 0 before. If a state was always regulated, the indicator is 0 throughout, if it was always deregulated, the indicator is 1 throughout. Sample period is 1975 to 1991 and Delaware and South Dakota are dropped, so N=833. Non-interest expenses become available only in 1984, so N=392. The coefficient on the deregulation indicators is reported, with robust standard errors in parentheses. ***, **, * denote statistically significant at the 1, 5, and 10 percent levels.

	Dependent Variable							
	Growth in Personal Income	Log of # of Banks	Log of # of Banking Companies	Log of # of Branches	Branches per Bank	Branches per Banking Company	Log of Non-Interest Expenses	Loan Loss Provisions / Loans + Leases
Merger & Acquisition Branching Indicator	0.013***	-0.192***	-0.162***	0.075	0.930**	1.146**	-0.107***	-0.007***
	(0.004)	(0.039)	(0.037)	(0.101)	(0.432)	(0.453)	(0.035)	(41.035)
Unrestricted Statewide Branching Indicator	-0.008	-0.008	0.086	0.055	0.898**	-0.043	0.070*	0.005**
	(0.005)	(0.040)	(0.059)	(0.130)	(0.422)	(0.574)	(0.037)	(0.002)
Interstate Banking Indicator	0.006	-0.064*	-0.052	0.047	0.414	1.064**	0.005	-0.001
	(0.005)	(0.035)	(0.057)	(0.063)	(0.326)	(0.511)	(0.030)	(0.001)
Multi-bank Holding Company Indicator	-0.005	0.023	-0.096*	-0.001	-0.832*	-0.364	-0.095**	-0.001
	(0.006)	(0.042)	(0.052)	(0.112)	(0.444)	(0.529)	(0.036)	(0.001)
Dependent Variable Mean [Median]	0.086	5.002	4.881	6.064	6.293	6.649	13.812	0.009
	[0.082]	[5.236]	[5.136]	[6.254]	[4.327]	[5.055]	[13.803]	[0.006]

Appendix IB: Univariate Regressions of the Effects of Different Types of Branching Deregulation on Economic Growth, Banking Structure, and Bank Efficiency

This table contains regressions of state-level economic growth and state-level measures of the structure and efficiency of the banking industry. Each dependent variable is regressed on a set of state indicator variables, a set of year indicator variables, and *one* of the four deregulation indicators; these indicators are equal to 1 after deregulation and 0 before. Each column thus presents the coefficient estimates of four separate regressions. If a state was always regulated, the indicator is 0 throughout, if it was always deregulated, the indicator is 1 throughout. Sample period is 1975 to 1991 and Delaware and South Dakota are dropped, so N=833. Non-interest expenses become available only in 1984, so N=392. Each model is estimate separately for each type of deregulation. The coefficient on the deregulation indicators is reported, with robust standard errors in parentheses. ***, **, * denote statistically significant at the 1, 5, and 10 percent levels.

	Dependent Variable							
	Growth in Personal Income	Log of # of Banks	Log of # of Banking Companies	Log of # of Branches	Branches per Bank	Branches per Banking Company	Log of Non-Interest Expenses	Loan Loss Provisions / Loans + Leases
Merger & Acquisition Branching Indicator	0.010**	-0.195***	-0.138***	-0.099	1.233**	1.124**	-0.077*	-0.005***
	(0.004)	(0.046)	(0.049)	(0.074)	(0.468)	(0.512)	(0.039)	(0.001)
Unrestricted Statewide Branching Indicator	0.001	-0.136***	-0.023	0.107	1.532***	0.795	0.015	0.001
	(0.005)	(0.051)	(0.064)	(0.095)	(0.464)	(0.627)	(0.042)	(0.002)
Interstate Banking Indicator	0.006	-0.076**	-0.039	0.054	0.632*	1.153**	0.006	-0.001
	(0.006)	(0.032)	(0.052)	(0.066)	(0.366)	(0.436)	(0.032)	(0.001)
Multi-bank Holding Company Indicator	-0.003	0.004	-0.113**	0.004	-0.756	-0.349	-0.101***	-0.001
	(0.006)	(0.048)	(0.053)	(0.111)	(0.524)	(0.582)	(0.037)	(0.001)
Dependent Variable Mean [Median]	0.086	5.002	4.881	6.064	6.293	6.649	13.812	0.009
	[0.082]	[5.236]	[5.136]	[6.254]	[4.327]	[5.055]	[13.803]	[0.006]