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

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This paper investigates private-interest, public-interest, and political-institutional theories of regulatory change to analyze state-level deregulation of bank branching restrictions. Using a hazard model, we find that interest group factors related to the relative strength of potential winners (large banks and small, bank-dependent firms) and losers (small banks and the rival insurance firms) can explain the timing of branching deregulation across states during the last quarter century. The same factors also explain congressional voting on interstate branching deregulation. While we find some support for each theory, the private interest approach provides the most compelling overall explanation of our results.

I. INTRODUCTION

The pervasive economic deregulation of the last quarter century poses a key challenge for positive theories of regulatory change. The private-interest theory of regulation, also called the economic theory, characterizes the regulatory process as one in which well-organized groups use the coercive power of the state to capture rents at the expense of more dispersed groups (e.g., Stigler [1971], Peltzman [1976, 1989], and Becker [1983]). This approach contrasts with the public-interest theory of regulation in which government intervention corrects market failures and maximizes social welfare (see Joskow and Noll [1981]). 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 Irwin and Kroszner [1999]).

While the private-interest theory has had much success in explaining a wide variety of regulatory interventions that are difficult to rationalize on public-interest grounds (see Stigler

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[1988]), it has been less effective in explaining the removal of such regulations [Peltzman 1989; Noll 1989]. In contrast, the public-interest theory can account for welfare-enhancing deregulation but not for the origin of regulations that reduced competition and that had few, if any, welfare benefits.

This paper examines the elimination of restrictions on bank branching since the 1970s to assess the relative explanatory power of these theories of regulatory change. Unlike most other recent episodes of deregulation that occurred at a national level—such as in railroads, trucking, airlines, long-distance telecommunications, securities brokerage, petroleum, and natural gas—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.

To investigate what drives deregulation, we use a hazard model to explain the timing of intrastate branching deregulation. We 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 that effectively eliminated branching restrictions nationwide. This allows us to determine whether the same factors driving state-level deregulation can also explain congressional voting on federal repeal of interstate branching restrictions.

We find that deregulation occurs earlier in states with fewer small banks, in states where small banks are financially weaker, and in states with more small, presumably bank-dependent, firms. Also, a larger insurance industry delays deregulation when banks may compete in the sale of insurance products. Interest group factors related to the relative strength of potential winners (large banks and small firms) and losers (small banks and the rival insurance firms) thus can explain the timing of branching deregulation across states. The same interest group variables also can explain the voting pattern of legislators in the U. S. House of Representatives on interstate banking deregulation. We then examine broad technological, legal, and financial innovations that altered the costs and benefits of the regulations and can explain why deregulation began in the 1970s rather than earlier [Kane

1996]. While some of our findings can be rationalized on public-interest grounds, the private-interest theory provides a simple way to understand these results as a whole.[1]

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 substantial revenues [Sylla, Legler, and Wallis 1987].[2] To enter the business, one had to obtain a bank charter. States received fees for granting charters, and they often owned or purchased shares in banks or levied taxes on banks. To enhance these revenues, 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.[3] Since states received no charter fees from banks incorporated in other states, the states prohibited out-of-state banks from operating in their territories—hence the origin of the prohibition on interstate banking.[4]

Legislatures also often restricted intrastate expansion. States would grant a charter for a specific location or limit bank branches to that city or country. By adopting branching restrictions, states created a series of local monopolies from which they could extract 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

1. Jarrell [1984] tests the private interest theory of regulatory exit using the end of fixed commissions at the New York Stock Exchange. Also see Peltzman [1989] and Noll [1989]. Kane's [1996] "regulatory dialectic" emphasizes technological change interacting with private interests.

2. 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.

3. Noll [1989] has characterized conceiving of governments as distinct interest groups concerned about financing their expenditures as the Leviathan Approach; see 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]). While there had been some initial ambiguity concerning state authority over these institutions, the 1927 McFadden Act clarified that, until the 1994 Riegle-Neal Act, states effectively had the right to prevent interstate branching and to force national banks to conform to state branching regulations. See White [1983].

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 I and Figure I). Although there had been some changes in state branching laws during the late nineteenth and early twentieth centuries, these laws have remained stable since the Great Depression. Some 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 concerns the formation of multibank holding companies (MBHCs) that were permitted to own multiple banks but had to operate them separately. The offices of the banks in an MBHC could not be integrated into a single network, so a depositor at one bank would not have access to her deposits at another. The banks in an MBHC also could not consolidate their back-office operations, and each 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 deregulation occurs when states permit branching by merger and acquisition, thereby allowing MBHCs to convert offices of subsidiary banks (existing or acquired) into branches of a single bank. An MBHC could then integrate its banking offices into a single branch network. A third reform occurs when states permit full statewide branching, whereby banks could open new branches anywhere within state borders.[5]

The Douglas amendment to the Bank Holding Company Act of 1956 prevented holding companies from buying out-of-state banks unless that state explicitly permitted such acquisitions by statute (see Macey and Miller [1992]). Since no state allowed such acquisitions, holding companies were effectively prohibited from crossing state lines. Deregulation began in 1975 when Maine passed legislation permitting out-of-state bank holding compa-

5. Permitting branching only through merger and acquisition before full statewide 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.

TABLE I

YEAR OF DEREGULATION OF RESTRICTIONS ON GEOGRAPHICAL EXPANSION, BY STATE

State	Intrastate branching through M&A	Full intrastate branching permitted	Interstate banking permitted	Multibank 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.

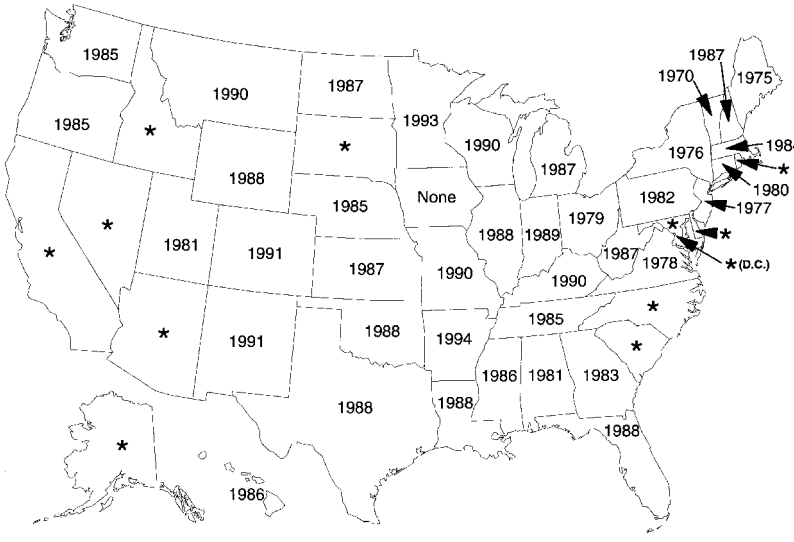

FIGURE I
Deregulation of Restrictions on Intrastate Branching
*Permitted Intrastate Branching before 1970.

nies to acquire Maine banks. As part of the Garn-St Germain Act, federal legislators in 1982 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 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 I and Figure I illustrate the history of state deregulation of geographical restrictions since 1970. The state-by-state deregulation culminates in the phaseout 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 at the state level.[6]

6. 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.

III. Hypotheses and Variable Definitions

Our empirical tests are based on the timing of intrastate branching deregulation through merger and acquisition. We focus on this form of branching deregulation because it has a much greater economic impact than the other forms of branching deregulation (see the Appendix). Deregulation through merger and acquisition is the only type of branching deregulation that consistently has a statistically significant effect on banking structure, bank efficiency, and overall economic growth, and the estimated magnitudes of the effects are greatest for this type of deregulation. We also 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.[7]

In the remainder of this section we describe our hypotheses about the private-interest, public-interest, and political-institutional theories along with the data sources used to construct the variables. Some of the variables 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. Our method is to assess the relative importance of factors representing each approach in speeding or slowing deregulation.

A. Hypotheses

Intraindustry Rivalry. Small banks have fought to maintain and extend branching restrictions both historically and in the recent debates.[8] Smaller banks appear to have been the main winners from antibranching laws since these restrictions protect them from competition from larger and more efficient banking organizations (see Flannery [1984], Jayaratne and Strahan [1998],

7. We do not employ a hazard model to explain the timing of interstate deregulation for two reasons: the time clustering of interstate deregulation and complications of the strategic interdependence of the states' behavior. As the number of states in an interstate arrangement increases, for example, the effects on potential acquirers is ambiguous: they might prefer a larger pool of potential target banks but might have to pay more as the number of competing acquirers expands. The benefit to potential targets tends to increase with the number states in an arrangement since the expected selling price increases with the number of potential bidders [Brickley and James 1987].

8. Economides, Hubbard, and Palia [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 historical opposition. On the small bank opposition to the recent branching deregulation, see Kane [1996] and *The Economist* [8/6/94, p. 59].

and Winston [1993]). Branching restrictions thus tend to reduce the efficiency and consumer convenience of the banking system.[9]

The private-interest theory therefore predicts that reform should occur later in those states where the strength of the small banks relative to that of the large banks is greater. According to the public-interest theory, deregulation should take place earlier where small banks are relatively important because the social costs of the regulation are directly related to the size of the protected sector. The social costs include deadweight costs and losses associated with inefficiencies in the production of banking services, relative to production without geographical restrictions.

Interindustry Rivalry. A number of states permit state-chartered commercial banks to sell insurance. The insurance lobby would thus oppose the relaxation of branching restrictions when banks can sell insurance because such deregulation might permit banks to provide a more efficient insurance distribution network.[10] According to the private-interest theory, reform should occur later in states where banks can sell insurance and the insurance industry is important relative to the banking industry. The efficiency costs of the branching restrictions, however, rise with the size of the insurance sector since the restrictions prevent the exploitation of scope economies. Under the public-interest theory, reform should therefore occur earlier where banks can sell insurance and the insurance industry is relatively large.[11]

Consumers of Banking Services. Banks are a major source of credit for small firms [Cole and Wolken 1994]. Branching deregulation tends to reduce banks' local market power [Jayaratne and Strahan 1998]. In addition, Strahan and Weston [1998] find that lending to small businesses increases on average when small banks are purchased by other banking organizations, and Berger et al. [1998] 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

9. Flannery [1984] shows that small banks in states with branching restrictions have higher costs than small banks in states without such restrictions, and the Appendix shows how the production of banking services becomes more efficient following deregulation.

10. *The Economist* [8/6/94, p. 59] describes the insurance industry's opposition to branching deregulation.

11. Another rival interest we considered was the Savings and Loan industry. The share of assets in Savings and Loans relative to banking plus Savings and Loan assets in the state, however, had only small and statistically insignificant effects in the models we estimate below.

from branching deregulation in particular and bank consolidation in general, the private-interest theory would predict that states with numerous small, bank-dependent firms would deregulate earlier.[12] This prediction, however, is also consistent with the public-interest theory since the social costs of the restrictions are higher in states with more small, bank-dependent firms.

Another effect of branching restrictions on bank customers can be related to the prices paid for bank services. High loan prices before deregulation may reflect, for example, 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 private-interest theory, however, does not have a clear implication: 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]).[13]

Bank Stability. Geographic diversification through branching could mitigate instability problems that were important during much of our sample period, thereby improving welfare. Instability also 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; politicians also may anticipate that such banks are less likely to be able to provide future contributions and support [Gunther 1994, 1996].[14] Both the private-interest and public-interest theories thus suggest that deregulation is most likely in states where banking instability is greatest.

12. 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]).

13. High loan interest rates also could reflect compensation for higher risks and fewer opportunities for banks to diversify. If state-specific risks explain differences in average loans rates, then neither theory would have any predictions for the sign of this effect. Following branching deregulation, however, loan interest rates tend to fall but bank risk profiles do not appear to change [Jayaratne and Strahan 1998; Kroszner and Strahan 1998]. This suggests that high loan rates in antibranching states are not simply reflecting state-specific risks.

14. 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 costs of the antibranching policy (see Kane [1996]).

Political-Institutional Factors. Republicans are typically perceived as more likely to favor deregulation than Democrats, so the political-institutional theories suggest that states that are controlled by Democrats deregulate later than those controlled by Republicans.[15] In addition, we investigate whether reform becomes more likely when one party controls the legislature and the governorship. Note that these political effects must be interpreted with caution, since the views of the politicians may simply reflect the economic interests of the constituents in the state (see Peltzman [1984]).

B. Variable Definitions and Data Sources

Our main proxy for the strength of the small banks is the fraction of banking assets in the state in "small" banks. We define small banks as banks with assets below the median size in each state. By allowing the definition of small to vary across states, we take into account cross-state heterogeneity in bank sizes.[16] Annual data on bank size are from the fourth quarter *Reports of Income and Conditions* ("Call Reports") from the Federal Reserve Board. We also include the capital-to-asset ratio of small banks relative to large as a measure of their relative financial health. Specifically, this variable is the asset-weighted average capital-asset ratio for small banks minus the asset-weighted average capital-asset ratio for large banks. Annual data on bank capital are from the Call Reports.

To measure the effects of the rival insurance industry, we first construct an indicator variable that is one if the state permits banks to sell insurance. 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

15. For more detail on the importance of legislative structures, party politics, and ideology, see Poole and Rosenthal [1997], Kahn and Matsusaka [1997], Irwin and Kroszner [1999], and Kroszner and Stratmann [1999].

16. 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. 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 multibank 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 the 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 same results on the importance of intraindustry differences.

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].

To measure the relative importance of small, bank-dependent borrowers, we include the proportion of all establishments operating in the state with fewer than twenty employees. These data are compiled by the Bureau of the Census.[17] As a measure of prices, we use the difference between the average interest rate on loans in the state and the prevailing federal funds rate, 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.[18] These data are from the end-of-year Call Reports but become available beginning only in 1976. 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.[19]

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.[20]

17. We collected the establishment data by the 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.

18. 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.

19. As alternative measures of distress, we used (1) the bank failure rate, measured as the number of failed institutions in the state relative to the total number of banks, (2) the overall capital-to-asset ratio of all banks in the state, and (3) the growth in state personal income. Our results are not sensitive to the choice of distress proxy.

20. 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

IV. Methods and Results

In this section we first estimate how the variables described above influence the timing of state-level branching deregulation using a hazard model. Next, we discuss the robustness of the results, including a test of whether the ex post impact of deregulation on the different interest groups is consistent with our interpretation of the coefficients. We then 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

We consider the period from the beginning of our sample (1970) until deregulation as the "duration of regulation" or the "time until deregulation." The hazard rate, $h(t)$, is the likelihood that a state deregulates at time t, given that the state has not yet deregulated [Kalbfleisch and Prentice 1980; Kiefer 1988; Greene 1997]. To model the duration of regulation, we must decide what structure, if any, to impose on the hazard function. The Kaplan-Meier product-limit estimator provides a simple, nonparametric way to estimate the shape of the hazard function over time [Greene 1997].[21] Figure II 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.

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

$$h[t, \mathbf{x}(t), \mathbf{b}] = h_0(t) \exp[\mathbf{x}(t)'\mathbf{b}],$$

where $\mathbf{x}(t)$ is a vector of time-varying covariates; $\mathbf{b}$ is a vector of unknown parameters to be estimated; and the baseline hazard

variables. Note also that Nebraska has a nonpartisan, unicameral legislature. We assume that the party of the Governor controls the state government for Nebraska and set the unified government indicator to one. As another alternative, we tried including a variable that is one if party control of the legislature or governorship changes, but it did not have an economically or statistically significant effect and did not affect any of the other results.

21. 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.

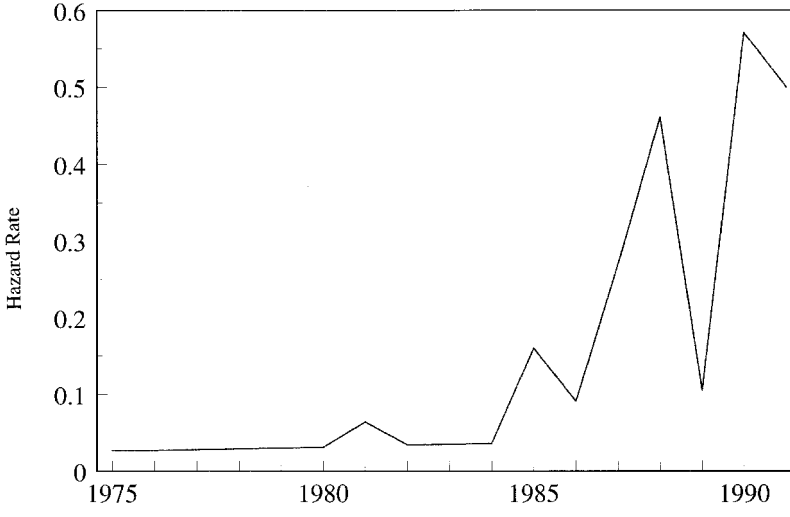

FIGURE II
Kaplan-Meier Estimate of Hazard Rate for Branching Deregulation

rate, $h_0(t)$, is pt^{p-1} with shape parameter p that will be estimated from the data. When $p > 1$, this model displays a monotonically increasing hazard rate. To estimate the parameters, we maximize the following log-likelihood function [Kiefer 1988]:

$$L(\mathbf{b}) = \sum_{i=1}^{N} d_i \ln h[t_i, \mathbf{x}(t_i), \mathbf{b}] - \sum_{i=1}^{N} \int_0^{t_i} h[u, \mathbf{x}(u), \mathbf{b}]\, du,$$

where N indexes the number of states at risk at the beginning of the sample period; d_i is an indicator equal to one for the states that deregulated by the end of the sample period and zero for the states that do not deregulate (i.e., the censored observations); and t_i is the time of deregulation for the ith state. This formulation assumes that the time until deregulation is independent across states, but the observations of the same state over time are not assumed to be independent. In addition, we use a robust estimation procedure to calculate the standard errors [Lin and Wei 1989].

We exclude states that deregulated before 1970 from the analysis, so N equals 39 states. During the sample period, 36 of the 39 states deregulate. We have three censored observations for which d_i is zero (Arkansas, Iowa, and Minnesota), but our results

are not 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. Table II reports summary statistics and correlation coefficients for the explanatory variables we use in our analysis.

We use the Weibull model, rather than a model that does not impose any structure on the baseline hazard rate, so that we can calculate the change in the expected time to deregulation for a given change in the levels of the covariates.[22] 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 political economy factors and an error term: $\ln(T) = \mathbf{x}'\mathbf{b}^* + e$.[23] Because we assume that the baseline hazard rate is Weibull with a shape characterized by p, the new coefficients will be scaled by p; that is, $\mathbf{b}^* = -\mathbf{b}/p$.

The $\mathbf{b}^*$ coefficients represent the percentage change in the time to deregulation for a one-unit change in the covariates. A positive coefficient implies that an increase in the variable increases the expected time until deregulation. To gauge the economic importance of the effects, we will multiply the $\mathbf{b}^*$ by the standard deviation of the explanatory variables and then evaluate how much the changes in the variables raise or lower the expected time to deregulation.[24] In Table III we report the $\mathbf{b}^*$ coefficients.

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

$$h[t, \mathbf{x}(t), \mathbf{b}] = h_0(t) \exp[\mathbf{x}(t)'\mathbf{b}].$$

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]. When we compare the coefficients estimated by the Cox and Weibull models on our data, they are very close (see Kroszner and Strahan [1998]), so imposing a Weibull structure does not appear to distort our estimates.

23. 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).

24. The transformation to the log expected time domain is only strictly correct when the covariates are constant over time. Our interpretation of the coefficients is possible in the time-varying model if we assume that a one-standard-deviation difference would hold over the entire sample period; that is, the deregulation would occur so many years earlier or later if the variable in question were higher by one standard deviation from 1970 to 1992. Note that the mean number of years to deregulation in the sample is 15.8.

TABLE II

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

The number of observations is 637, except for the average interest rate on bank loans which becomes available only in 1976, so the number of observations is 408.

TABLE III

HAZARD MODEL OF POLITICAL ECONOMY FACTORS AFFECTING THE TIMING OF STATE BRANCHING DEREGULATION, 1970–1992

	(1)	(2)	(3)	(4)	(5)	(6)
Small bank asset share of all banking assets in state	6.48***	5.19***	6.32***	5.16***	4.88***	4.45***
	(1.22)	(1.37)	(1.35)	(1.18)	(1.33)	(0.88)
Capital ratio of small banks relative to large in the state	13.25***	9.21***	13.01***	10.67***	11.44***	9.06**
	(3.48)	(3.19)	(3.62)	(3.46)	(3.75)	(3.81)
Relative size of insurance in states where banks may sell insurance, 0 otherwise	3.24**	2.59*	3.15*	2.85*	2.72*	0.55
	(1.61)	(1.49)	(1.65)	(1.54)	(1.59)	(1.34)
Indicator is 1 if banks may sell insurance in the state	0.45***	0.37***	0.45***	0.38***	0.36***	0.01
	(0.10)	(0.11)	(0.10)	(0.08)	(0.09)	(0.12)
Relative size of insurance in states where banks may not sell insurance, 0 otherwise	−0.93**	−0.90***	−1.02**	−0.93*	−0.96*	−0.04
	(0.43)	(0.33)	(0.51)	(0.48)	(0.53)	(0.39)
Small firm share of the number of firms in the state	−9.72***	−6.14***	−9.52***	−9.43***	−9.52***	−15.09***
	(2.11)	(2.15)	(2.11)	(2.30)	(2.70)	(2.76)
Share of state government controlled by Democrats	0.31**	0.23**	0.30**	0.27**	0.26**	0.11
	(0.12)	(0.11)	(0.12)	(0.11)	(0.11)	(0.13)
Indicator is 1 if state controlled by one party	−0.04	−0.04	−0.04	−0.01	−0.02	0.17*
	(0.10)	(0.07)	(0.07)	(0.09)	(0.10)	(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**	0.19*	0.30***
				(0.10)	(0.10)	(0.09)
Indicator is 1 if state changes bank insurance powers	—	—	—	—	−0.08	−0.26**
					(0.12)	(0.13)
Includes regional indicators?	No	No	No	No	No	Yes
N	637	408	637	637	637	637
Log likelihood	−3.74	9.00	−3.60	−2.12	−1.91	11.92
p-value of χ^2 for regression	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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 banks 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 twenty employees. 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. Unit banking indicator equals 1 for states with unit banking restrictions. The change in insurance powers indicator equals one if the state changed the law to permit banks to sell insurance during the sample period. We divide the country into four regions and include regional indicators in column (5). Robust standard errors are in parentheses. ***, **, and * denote statistically significant at the 1, 5, and 10 percent levels.

The positive and statistically significant coefficient on small bank share implies that a greater small bank share delays deregulation, and this effect is economically important. A one-standard-deviation increase in the small bank share results in a 30 percent increase in the time until deregulation, or about 4.7 years. This result supports the implications of private-interest theory concerning intraindustry rivalry and is contrary to the public-interest theory.

The positive and statistically significant coefficient on the relative performance of small banks in the state implies that states deregulate later when small banks are relatively strong financially.[25] A one-standard-deviation increase in the relative capital-to-asset ratio results in a 15 percent rise in the time until deregulation, or about 2.4 years. This result is consistent with the private-interest theory but may also be consistent with a public-interest interpretation because the risk of failures (and a costly taxpayer-funded bailout) increases as small bank financial health declines.

Interindustry competition also helps explain the timing of deregulation. In states where banks can sell insurance, a relatively large insurance sector is associated with an increase in the expected time to deregulation.[26] A one-standard-deviation increase in the relative size of the insurance sector in those states that permit banks to sell insurance leads to a 22 percent increase in the time until deregulation, or about 3.5 years.[27] This result is consistent with the private-interest theory but not the public-interest theory.

Deregulation occurs earlier in states where small, bank-dependent firms are relatively numerous. A one-standard-

25. 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 do not reject the relative small to large bank capital ratio specification we have chosen.

26. 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.

27. 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.

deviation increase in the share of small firms reduces the time until deregulation by 18 percent, or about three years. This result concerning the interests of consumers of banking services is consistent with both the private- and public-interest theories.

Column (2) of Table III introduces the average interest rate on loans to the model 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. The public-interest theory would imply that the coefficient should be negative, while the implication of the economic theory does not have a clear sign prediction.

When we add the failure rate of banks to the specification in column (3), its coefficient is small and statistically insignificant. We do not find a linkage between the timing of state deregulation and statewide banking distress. Given that deposit insurance is funded federally, however, bank failures may raise the public's concerns about the costs of the regulations at the national, rather than the state, level. This interpretation can explain why the rate of bank failure does not affect the timing of state-level deregulation even though bank instability does appear to rise generally during the period of increasing deregulation (see Section V below).

Finally, the partisan structure of the state government also influences 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.

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 banks and large banks and on the relative size of insurance where banks compete are consistent with a private-interest approach but are difficult to explain on public-interest grounds.

B. Robustness Tests

Omitted Variables. States begin the sample period with different degrees of restrictions on bank expansion. These initial conditions may proxy for omitted factors determining the political-economy equilibrium in the state that could then affect the

subsequent timing of deregulation. For instance, some states began the period with unit banking, while other states allowed limited branching and the formation of multibank holding companies.

To test whether the stringency of initial restrictions on branching matters, we first divide the sample into states with and without the most extreme form of branching regulation, unit banking.[28] Column (4) of Table III 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, but the other results remain virtually unchanged. Next, we include an indicator variable that is one if the state permitted multibank 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.

Eleven states expand bank powers to include the sale of insurance products during our sample period. This could proxy for omitted factors about the relative strength of the insurance industry in the state. In column (5) we include an indicator variable that is one if the state changes the law during our sample period to permit banks to sell insurance business and zero otherwise. The coefficient estimate is small and statistically insignificant and does not affect the other results.[29]

In column (6) we introduce four regional indicator variables: North, South, Midwest, and West.[30] The coefficients on small bank share, the relative capital-to-assets ratio, and small firm share change little. Although the coefficient estimate still suggests that

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.

29. We conducted a likelihood ratio test of whether the unit banking states, the MBHC states, and the states that changed their regulations of bank insurance powers could be pooled with the other states. In all three cases, we could not reject pooling of the data.

30. Since intrastate deregulation generally preceded interstate deregulation and the latter typically took the form of regional interstate compacts, the possibility of 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.

in states where banks can sell insurance a larger relative size of the insurance sector delays deregulation, the effect is no longer statistically significant. The coefficient on the indicator variable for whether a state expands bank powers to permit insurance sales during the sample period, however, now becomes statistically significantly negative. This implies that deregulation occurs roughly 4.1 years earlier in states where the insurance lobby may be relatively weak. While the inclusion of the regional indicators does not affect the other results, the results on insurance do appear to be sensitive to the specification of the hazard model.[31]

Estimation Technique. To check the robustness of using a hazard model and to investigate whether the time-series or the cross-sectional variation in each of the factors accounts for the hazard results, we estimate two simple linear probability models (neither are reported). First, we run a pooled time-series cross-section OLS regression using the 637 observations from the hazard model. The dependent variable equals one in the year of deregulation and zero otherwise. We include the same set of regressors that were used in the hazard model and add state-level fixed effects. This specification thus removes the cross-state variation from the independent variables and focuses on their movements over time. In this model, the signs of the coefficients on the interest group factors are consistent with the results from the hazard model, and the coefficients for the small bank relative capital ratio and for the relative size of insurance where states can sell insurance are statistically significant.

In the second model, we eliminate the time-series variation by averaging each of the explanatory variables over time. We thus have one observation per state that had branching restrictions as of 1970 ($N = 39$). The dependent variable equals the inverse of the number of years until deregulation, which represents an estimate of the state's probability of deregulating in a year under the assumption that this probability is constant over time and each year provides an independent observation.[32] Although we have only 39 observations, the coefficients on the small bank market share, small bank relative capital ratio, and small firm share

31. 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.

32. For instance, the dependent variable would take the value of 0.1 for a state that deregulated in 1980. For the three states that did not deregulate, the dependent variable equals 0.

variables are statistically significant. The signs of the effects of the insurance variables are the same as those reported in the hazard model but not statistically significant.

The hazard model and linear probability models thus produce very similar results. The estimates from the latter suggest that the effects for the small bank market share and small firm share variables are driven primarily by cross-state variation; the effect of the insurance variable is driven primarily by time-series variation; and the small bank capital effect is driven by both cross-sectional and time-series variation.

Ex Post Consequences of Deregulation. Finally, to check the plausibility of our interpretation of the hazard results, we consider whether the ex post consequences of deregulation are consistent with the ex ante lobbying positions we attribute to each interest group (see Kroszner and Strahan [1998] for details). We find that small banks lose market share following deregulation and, in states where banks can enter the insurance business, the insurance sector shrinks relative to the banking sector following deregulation. Borrowers also benefit from deregulation through lower average interest rates on loans. These findings support the private-interest interpretation of the coefficients in the hazard model: groups that will benefit lobby to speed deregulation and those that will be harmed lobby to slow it.

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

We now examine whether the forces driving intrastate branching deregulation also drive interstate deregulation. Financial services interests are active contributors and lobbyists in Washington. Their political action committees constitute the 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 [1998]).

As noted above, after virtually all states adopted intra- and interstate branching deregulation, the 1994 Riegle-Neal Act repealed the 1927 McFadden Act to eliminate all barriers to interstate banking and branching by 1997. 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

had been debated in Congress during the years prior to the passage of the Riegle-Neal Act, 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 to a financial services reform package.[33] Although the amendment passed by 210 to 208, the bill to which it was attached subsequently was defeated.

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 with low small bank shares: 0.04 in Ohio (Wylie) and 0.02 in North Carolina (Neal). In contrast, the sample mean in 1991 is 0.08 (median = 0.07). Michigan, home state of the Senate's sponsor of the 1994 Riegle-Neal Act, also had relatively low small bank strength (small bank share of 0.05).

Table IV reports 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 IV 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 a force favoring deregulation has a negative coefficient in the hazard model (Table III) but a positive coefficient in the probit model.

Consistent with the state-level deregulation process, 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 is the most important interest group influence on a legislator's voting decision. 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

33. The Wylie-Neal amendment also included provisions limiting certain insurance and real estate powers of national banks [*Congressional Record,* November 14, 1991, pp. 10239–10242].

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

TABLE IV

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

	(1)	(2)	(3)	(4)	(5)	(6)
Small bank asset share of all banking assets in state	−4.17***	−4.54***	−4.07***	−4.43***	−4.50***	−4.90***
	(1.24)	(1.22)	(1.20)	(1.47)	(1.49)	(1.47)
Capital ratio of small banks relative to large in the state	1.80	2.68	2.56	1.69	1.53	2.45
	(3.75)	(3.42)	(3.75)	(3.78)	(3.80)	(4.25)
Relative size of insurance in states where banks may sell insurance, 0 otherwise	−2.34**	−2.49**	−2.33**	−2.49**	−2.51**	−1.54
	(1.02)	(1.14)	(1.01)	(1.04)	(1.02)	(1.11)
Indicator is 1 if banks may sell insurance in the state	0.79***	0.74***	0.69***	0.70***	0.70***	0.67***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
Relative size of insurance in states where banks may not sell insurance, 0 otherwise	1.80***	2.42***	1.54**	1.73***	1.72***	2.03**
	(0.66)	(0.72)	(0.67)	(0.66)	(0.67)	(0.91)
Small firm share of the number of firms in the state	−1.23	−0.83	−1.62	−1.32	−1.30	−0.94
	(0.92)	(0.89)	(1.07)	(0.95)	(1.00)	(1.16)
Indicator is 1 if Representative is a Democrat	−0.35***	−0.35***	−0.36***	−0.35***	−0.35***	−0.36***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(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	0.04	−0.01
				(0.07)	(0.07)	(0.08)
Indicator is 1 if state changes bank insurance powers	—	—	—	—	−0.01	−0.03
					(0.07)	(0.07)
Includes regional indicators?	No	No	No	No	No	Yes
Pseudo-R^2	0.17	0.18	0.17	0.17	0.17	0.18
Log likelihood	−240.24	−238.26	−239.51	−240.13	−240.10	−238.08
p-value of χ^2 for regression	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

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 one 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 twenty employees. Party indicator is one if the Representative is a Democrat. 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. Unit banking indicator equals one for states with unit banking restrictions. The change in insurance powers indicator equals one if the state changed the law to permit banks to sell insurance during the sample period. We divide the country into four regions and include regional indicators in column (5). Robust standard errors are in parentheses. ***, **, and * denote statistically significant at the 1, 5, and 10 percent levels.

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 rival interests outside of banking 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 insurance in those states which permit banks to sell insurance decreases 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 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 significant. Overall, the probit analysis of the vote on national branching deregulation supports the private-interest 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.

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

A complete explanation of regulatory exit should account for why deregulation begins in the 1970s as well as the timing of the state-by-state reforms [Kane 1996]. In this section we describe broad technological, legal, and economic shocks that altered the political-economy equilibrium which had kept antibranching regulations little changed for at least 30 years.

Beginning in the 1970s, three innovations reduced the value to the protected banks of local geographic monopolies (see Table V). First, automatic teller machines (ATMs) helped to erode the geographic ties between customers and banks. Second, checkable money market mutual funds and the Merrill Lynch Cash Management Account demonstrated that banking by mail and telephone

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.

TABLE V
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

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 with 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.

provided a convenient alternative to local banks.[36] Third, technological innovation and deregulation reduced transportation and communication costs, particularly since the 1970s, thereby lowering the costs for customers to use distant banks. By increasing the elasticity of deposits supplied to banks, these innovations reduced the value of geographical restrictions to their traditional beneficiaries and thereby reduced their incentive to fight to maintain them [Peltzman 1976].

On the lending side, increasing sophistication of credit-scoring techniques, following innovations in information processing, financial theory, and the development of large credit data bases, began to diminish the value of knowledge that local bankers had about the risks of borrowers in the community. As a

36. 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 elimination of interest rate ceilings on large denomination certificates of deposit during the 1970s appears to have hurt smaller and retail-oriented banks relative to larger, wholesale banks [James 1983].

result of these innovations, a national market developed for residential mortgages, credit card receivables have been securitized, and bank lending to small business now relies less on the judgment of loan officers and more on standardized scoring models.

These changes have increased the potential profitability for large banks to enter what had been the core of small bank activities. Large banks' incentive to increase their lobbying pressure to be able to expand into these markets has thus been increasing over time. In fact, small banks' market share began to decline even prior to the branching deregulation (Table V). As the value of a local banking relationships declined, small firms that were the main borrowers from the small banks also probably became more likely to favor the entry of large banks into local markets. With the deadweight costs of preventing large bank entry rising, the private-interest theory predicts that small local banks would become less likely able to maintain the branching restrictions [Becker 1983]. Deregulation that reduces deadweight costs of regulation is also consistent with the public-interest theory.

Kane [1996] argues that another major shock to the old equilibrium was the increasing public awareness of the costliness of having government-insured but (geographically) undiversified financial institutions. In the late 1970s the failure rate of banks began to rise (Table V). In the 1980s the Savings and Loan crisis and taxpayer bailout further heightened public awareness about the costs of restrictions that make depository institutions more likely to require infusions of taxpayer funds. The failures thus may have heightened public support for branching deregulation (see also 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 states.

These technological, economic, and legal shocks generated conditions that changed the long-standing balance favoring the antibranching forces. The marginal value of lobbying to repeal branching restrictions increased just as the relative value to the small banks of maintaining branching restrictions was declining. These nationwide shocks are common factors across states, and they are consistent with the positive duration dependence associated with state-level deregulation that we demonstrated in Figure II. In addition, a broad change in "ideology" against government

regulation could explain the positive duration dependence during the sample period.

VI. Conclusions

The private-interest theory of regulation can account for the pattern of bank branching deregulation of the 1970s and 1980s. Beneficiaries of branching regulation had supported a coalition favoring geographical restrictions despite their costs to consumers of financial services. Innovations that began in the 1970s altered the value of the restrictions to the affected parties, and the resulting competition among interest groups can explain the subsequent deregulation. 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 political-institutional factors affect deregulation, although these variables may act as proxies for unmeasured economic interests. The greater success of the private-interest theory to explain deregulation here than in previous work may be due to the richer cross-sectional and time-series variation in branching deregulation that can be exploited with a hazard model. Future empirical studies of endogenous deregulation thus may be most fruitful where change has occurred across states over time, such as in franchising, insurance, 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, 1997], and Kroszner and Stratmann [1998]), and internationally, for example, through the extension of financial services provisions of NAFTA to reduce geographic barriers across countries [Kroszner 1997].

Appendix: 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, 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 banking companies and the number of branches per banking company), and efficiency (the log of total noninterest 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.

Table VI shows the results of including the set of four

TABLE VI
MULTIVARIATE REGRESSIONS OF THE EFFECTS OF DIFFERENT TYPES OF BRANCHING DEREGULATION ON ECONOMIC GROWTH, BANKING STRUCTURE, AND BANK EFFICIENCY

	Dependent variable				
	Growth in personal income	Log of # of banking companies	Branches per banking company	Log of non-interest expenses	Loan loss provisions/ (loans + leases)
Merger & acquisition branching indicator	0.013*** (0.004)	−0.162*** (0.037)	1.146** (0.453)	−0.107*** (0.035)	−0.007*** (0.001)
Unrestricted statewide branching indicator	−0.008 (0.005)	0.086 (0.059)	−0.043 (0.574)	0.070* (0.037)	0.005** (0.002)
Interstate banking indicator	0.006 (0.005)	−0.052 (0.057)	1.064** (0.511)	0.005 (0.030)	−0.001 (0.001)
Multibank holding company indicator	−0.005 (0.006)	−0.096* (0.052)	−0.364 (0.529)	−0.095** (0.036)	−0.001 (0.001)
Dependent variable mean [median]	0.086 [0.082]	4.881 [5.136]	6.649 [5.055]	13.812 [13.803]	0.009 [0.006]

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 one after deregulation and zero before. If a state was always regulated, the indicator is zero throughout; if it was always deregulated, the indicator is one throughout. Sample period is 1975 to 1991, and Delaware and South Dakota are dropped, so N = 833. Noninterest expenses become available only in 1984, so N = 392. The coefficient on the deregulation indicators is reported, with robust standard errors in parentheses. ***, **, and * denote statistically significant at the 1, 5, and 10 percent levels.

deregulation indicators simultaneously. The branching by merger and acquisition indicator is statistically significant and of the expected sign in all five of the 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 also ran univariate specifications which included each indicator separately and the results are very similar. 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. See Kroszner and Strahan [1998] for more details.

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