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Regulation and Deregulation of the US Banking Industry
Causes, Consequences, and Implications for the Future

Randall S. Kroszner and Philip E. Strahan

8.1 Introduction

The banking industry has been subject to extensive government regulation covering what prices (that is, interest rates) banks can charge, what activities they can engage in, what risks they can and cannot take, what capital they must hold, and what locations they can operate in. Banks are subject to regulation by multiple regulators at both the state and federal level. Each state has its own regulatory commission. At the federal level the primary bank regulators are the Office of the Comptroller of the Currency (OCC), the Federal Deposit Insurance Corporation (FDIC), and the Federal Reserve Board. Even banks that operate at a single location are likely to be regulated by at least one state and two federal bodies.

The banking industry also plays a significant part in both the financial system and the economy as a whole. The importance of the banking industry goes beyond its mere size; numerous studies (as we describe later) have shown that the health of this sector has significant effects on overall economic activity, as well as the size and persistence of economic cycles. Banks (along

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with other financial institutions) encourage and collect savings that finance economic growth. By allocating that savings and monitoring the use of those funds, banks play an integral role in assuring the productivity of resource use throughout the economy. Banks are also a crucial provider of liquidity to both individuals and firms, and this role becomes particularly important in times of economic stress and crisis. The quality of bank regulation, which affects the stability, efficiency, and size of the sector, thus has an important effect on the level and volatility of economic growth.

Regulation of banking has undergone tremendous change over time, with extensive regulations put into place in the 1930s, and later removed in the last quarter of the twentieth century. This deregulation has been accompanied by a dramatic reduction in the number of banking institutions in the United States, but not an increase in banking concentration at the local level. Regulatory change has been driven by both macroeconomic shocks as well as competition among interest groups within banking and between banks and other financial services providers. As we show, the role of both private interests and public interests play a key part in the analysis.

This chapter was completed and presented at an NBER conference in 2005, prior to the financial crisis of 2008. One of the themes that we developed was the importance of "market adaptation" to regulatory constraints. By "market adaptation," we mean actions and innovations undertaken by banks and their competitors to circumvent or reduce the costs of regulation. One of the consequences of market adaptation was to provide incentives for the creation of alternative institutions and markets competing with but also connected to the banking system. This web of alternative institutions and markets is now loosely referred to as the "shadow banking" sector. While we will keep the bulk of the chapter as it was, we have added an epilogue to show how "market adaptation" may have contributed to fragilities that set the conditions for the financial crisis. We also touch briefly on postcrisis regulatory responses, such as Dodd-Frank and Basel III. Since many, if not most, of the postcrisis responses are yet to be implemented or will be phased in over many years, we will not be able to undertake the same detailed empirical analysis of the post-2008 regulatory responses that we do for the regulation from the financial crisis of the 1930s until the early 2000s.

This chapter has four main goals. First, we provide an overview of the major regulations that have affected the structure and efficiency of the banking industry. In section 8.2 we explain the origins of state and federal banking regulation and briefly describe how the laws and regulations have evolved. We focus on five areas: restrictions on entry and geographic expansion; deposit insurance; product-line and activity restrictions; pricing restrictions; and capital regulation.

Second, we evaluate the consequences of these regulations for the banking industry as well as for the financial system more broadly. Glass-Steagall regulation, to take one example, prevented commercial bank involvement

in the corporate bond and equity underwriting businesses until its recent repeal. Glass-Steagall not only kept commercial banks from competing with investment banks, but also spawned a variety of innovations and institutions such as venture capital to substitute where banks could not go. As noted earlier, "market adaptation" to regulatory constraints has generated change in the banking and financial services industry, as banks and their competitors attempt to circumvent the costs of regulations. Moreover, a regulation that at one point helped the industry may later become a burden and hence sow the seeds of its own demise. Interest rate restrictions that eliminated price competition among banks, for example, lost the support of the industry when new financial institutions and markets emerged to provide market rates of interest on checking-like accounts (e.g., the Merrill Lynch Cash Management Account from the 1970s). The first half of section 8.3 provides a brief overview of such consequences, adaptations, and regulatory responses.

Third, we investigate some of the real effects of bank regulatory change, on both the industry and the economy. The elimination of geographic restrictions on bank expansion that limited competition, for example, had positive consequences on the industry (by reducing the riskiness of banks and increasing their efficiency), on credit supply (by providing lower pricing of loans), and on the economy (by increasing economic growth and reducing economic fluctuations). Deregulation of restrictions on geographical expansion and product lines also led to a more consolidated but generally less locally concentrated banking system dominated by large and diversified banking organizations that compete in multiple markets.

Fourth, we provide a positive explanation for regulatory change (section 8.4). A variety of technological, legal, and economic shocks have altered the relative strengths, effectiveness, and interests of different groups competing for support or reform of banking regulation. The development of the automated teller machine (ATM) in the early 1970s, for example, reduced the value of geographic protections to smaller local banks, thereby reducing their willingness to fight to maintain restrictions on branching. A number of court decisions also changed the impact of long-standing regulations in areas such as usury ceilings. Economic crises, either system wide, as in the 1930s, or to parts of the financial system, as in the savings and loan crisis of the 1980s, have also had important distributional impacts that led to regulatory change. We provide some explanations for both the timing of regulatory changes broadly, and for the patterns of change across states.

Finally, in the epilogue, we describe briefly how many of the themes we saw develop in the seven decades following the Great Depression, such as market adaptation to regulation, accelerated during the 2000s and set the stage for the 2007–2008 crisis. To take one prominent example, more than $500 billion in loan pools moved from bank balance sheets to asset-backed commercial paper conduits between 2004 and 2007 (Acharya, Schnabl, and Suarez 2013). These assets were financed with short-term com-

mercial paper, rather than bank deposits as in traditional intermediation, motivated in least in part by an attempt to escape the original Basel capital regulations. The consequence was to create opaque interconnections and made the entire system vulnerable to losses of confidence in the underlying assets, such as mortgages.

8.2 Evolution of Key Dimensions of Bank Regulations

We begin by describing the historical origins and evolution of the most important dimensions of banking regulation in the United States: restrictions on bank entry and geographic expansion, deposit insurance, regulation of bank products, pricing restrictions, and capital requirements. Table 8.1 summarizes this history with the origins and evolution of the key legislative and regulatory decisions.[1]

8.2.1 Historical Background: States and the Federal Government

As we discuss in more detail in the next section, the origin of the power of states in the United States to regulate banking goes back to 1789. The Constitution gave states the right to charter banks as well as to regulate their activities. Alexander Hamilton, however, advocated the creation of a federally chartered bank to deal with debt from the Revolutionary War and to unify the currency. The First Bank of the United States was created in 1791 and operated until 1811. The accumulation of federal debt due to the War of 1812 then revived interest in a federal bank and the Second Bank of the United States was chartered in 1816. Farm interests and generally interests outside of the Northeast strongly opposed the Second Bank, arguing that it involved excessive centralized control of the financial system, usurped states' rights to charter banks, inappropriately drew resources from around the country into the hands of wealthy members of the Northeast elite, and unfairly competed with state-chartered banks (see Hammond 1957). Andrew Jackson built a coalition of antibank forces to win reelection in 1832 and vetoed the rechartering of the Second Bank. During the 1830s and 1840s, a number of states passed "free banking" statutes that encouraged entry of more banks.

This veto took the federal government out of banking and its regulation until the Civil War, when a variety of acts, including the National Banking Act of 1863, created a federal charter for banks and initiated the so-called dual banking system of competing state and federal regulation (see White

1. Another important and growing area of regulation are fair lending laws that attempt to expand credit to low-income areas and to reduce lending discrimination (e.g., the Community Reinvestment Act and the Home Mortgage Disclosure Act). We are not going to discuss these laws because this dimension of banking regulation, while very important, has not had major effects on the structure of the banking industry. For a comprehensive review of these laws, see Thomas (1993).

Table 8.1 **Evolution of banking regulations**

	Origin of regulation	History of deregulation
Restrictions on entry and expansion	Nineteenth century: States and comptroller of the currency limit access to bank charters and restrict branching. 1927: McFadden Act permits states to restrict branching of national banks. 1956: Bank Holding Company Act give states authority to restrict entry by out-of-state banks and holding companies.	1970s–1980s: States gradually relax restrictions on in-state branching and cross-state ownership; OCC and states relax chartering restrictions. 1982: Garn St Germain Act permits banks to purchase failing banks or thrifts across state lines. 1994: Interstate Banking and Branching Efficiency Act permits banks and holding companies to purchase banks across state lines and permits national banks to branch across state lines.
Deposit insurance	Early twentieth century: Some states introduce mutual-guarantee deposit insurance systems. 1933: Federal deposit insurance adopted ("temporary" then permanent in 1934). 1950–1980: Deposit insurance limit periodically raised, reaching $250,000 in 2008.	1987: Competitive Equality in Banking Act allocates $10.8 billion to recapitalize the FSLIC. 1989: Financial Institutions Reform, Recovery, and Enforcement Act adds additional funds to deposit insurance and restricts activities of thrifts. 1991: FDIC Improvement Act imposes risk-based deposit insurance and requires "prompt corrective action" of poorly capitalized depository institutions. 2006: Federal Deposit Insurance Reform Act merges bank and thrift funds, allows greater flexibility in setting risk-based premiums, and indexes coverage to inflation beginning in 2010. 2008: Deposit insurance increased to $250,000 overall and the limit is temporarily removed for all transactions deposits in response to the global financial crisis.

(*continued*)

Table 8.1 (*continued*)

	Origin of regulation	History of deregulation
Product restrictions	1933: Glass-Steagall Act separates commercial lending and underwriting. 1956: Bank Holding Company Act prevents holding companies from owning insurance or securities affiliates.	1987: Federal Reserve allows banks to underwrite corporate debt and equity. 1989–1996: Federal Reserve relaxes revenue restrictions on bank securities affiliates. 1999: Financial Modernization Act allows banks to underwrite insurance and securities through affiliates.
Limits on pricing	Nineteenth century and earlier: State usury laws limit interest on loans. 1933: Banking Act of 1933 (Glass-Steagall) limits interest on deposits (Regulation Q).	1978: *Marquette* decision allows banks to lend anywhere under the usury laws of the bank's home state. 1980: Depository Institutions Deregulation and Monetary Control Act (DIDMCA) phases out interest rate ceilings on deposits. 1980s: Credit card business flocks to South Dakota and Delaware to take advantage of elimination of usury laws.
Capital requirements	Nineteenth century and earlier: State and national banks are required to invest a minimum amount of equity to attain a bank charter.	1980s: Minimum capital-asset ratios required for banks. 1988 (effective 1992): Basel Accord mandates minimum ratio of capital to risk-weighted assets, which accounts crudely for differences in credit risk across loans and for bank off-balance sheet exposures. 1996: Market risk amendment to the Basel Accord introduces model-based capital requirement for trading positions. 2005 (with phased implementation): Consensus between international regulators achieved on Basel II Accord, which moves toward a comprehensive risk-based capital adequacy standard incorporating market, credit, and operational risk and encourages banks to use internal models to measure risk, but still subject to revision. 2009: International regulators begin negotiating to increase bank capital buffers and introducing liquidity ratio tests under the Basel III process.

1983). These newly created "national" banks were enticed to hold federal government debt to back their issuance of bank notes, thereby helping to finance the Civil War. The act also taxed the issuance of bank notes by state-chartered institutions, thereby giving an incentive for banks to switch from state to federal charters.

In the nineteenth century, private clearinghouse systems developed to provide some forms of private sector monitoring and "regulation" of bank activities. Although there is much controversy concerning the efficacy of the private clearinghouse system, the Panic of 1907 and the inability of the New York clearinghouses to prevent the collapse of important parts of the banking system again revived interest in federal involvement in banking.[2] The Federal Reserve Act of 1913 created a federally chartered central bank with important federal bank regulatory powers and a system of regional Federal Reserve Banks. This decentralized structure reflected the continuing struggle between the financial elites in the Northeast and interests in the rest of the country.

8.2.2 Chartering Restrictions and Restrictions on Geographic Expansion

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 state governments 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.

In addition to excluding banks from other states, the legislatures often restricted intrastate 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

2. See, for example, Calomiris and Kahn (1991) and Kroszner (2000).

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), and Niskanen (1971).

bank.[4] 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, as we describe more fully in the political economy section below (e.g., Stigler 1971; Peltzman 1976).

The 1927 McFadden Act clarified the authority of the states over the regulation of national bank's branching activities within their borders.[5] Although there was some deregulation of branching restrictions in the 1930s, most states continued to enforce these policies into the 1970s. For example, only twelve states allowed unrestricted statewide branching in 1970. Between 1970 and 1994, however, thirty-eight states deregulated their restrictions on branching. Reform of restrictions on intrastate branching typically occurred in a two-step process. First, states permitted multibank holding companies (MBHCs) to convert subsidiary banks (existing or acquired) into branches. MBHCs could then expand geographically by acquiring banks and converting them into branches. Second, states began permitting *de novo* branching, whereby banks could open new branches anywhere within state borders. Figure 8.1 describes the timing of intrastate branching deregulation across the states.

In addition to branching limitations within a state, until the 1980s states prohibited cross-state ownership of banks. Following passage of the McFadden Act, banks had begun circumventing state branching restrictions by building multibank holding companies with operations in many states. The Douglas Amendment to the 1956 Bank Holding Company (BHC) Act ended this practice by prohibiting a BHC from acquiring banks outside the state where it was headquartered unless the target bank's state permitted such acquisitions. Since all states chose to bar such transactions, the amendment effectively prevented interstate banking.

The first step toward change began in 1978, when Maine passed a law allowing entry by out-of-state BHCs if, in return, banks from Maine were allowed to enter those states. (Entry in this case means the ability to purchase existing banks, not to enter de novo.) No state reciprocated, however, so the interstate deregulation process remained stalled until 1982, when Alaska and New York passed laws similar to Maine's. State deregulation

4. 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.

5. Hubbard, Palia, and Economides (1996) examine the political economy of the passage of the McFadden Act and find results consistent with a triumph of the numerous small and poorly capitalized banks over the large and well-capitalized banks. See also White (1983) and Abrams and Settle (1993).

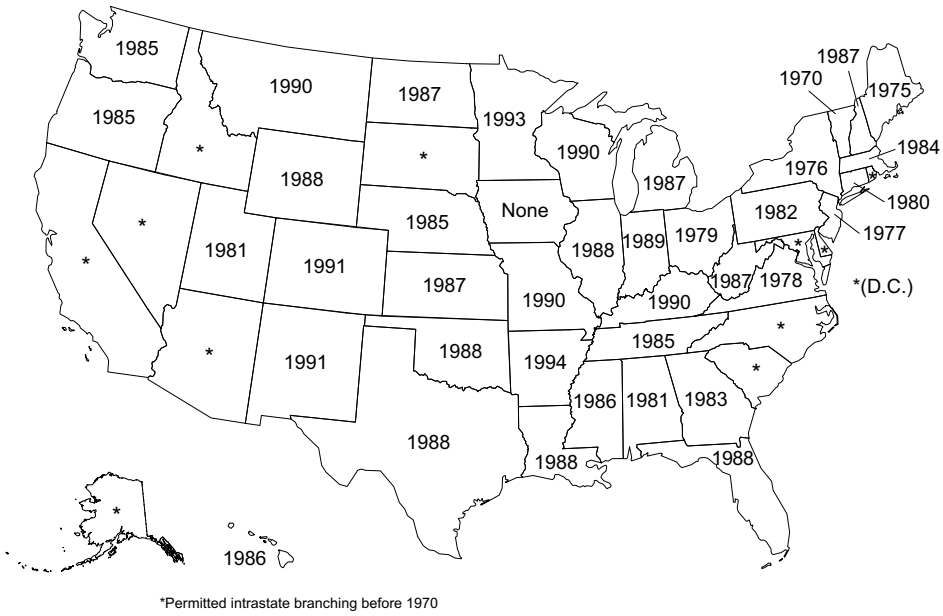

Fig. 8.1 Timing of deregulation of restrictions on intrastate branching
Source: Kroszner and Strahan (1999).

of interstate banking was nearly complete by 1992, by which time all states but Hawaii had passed similar laws. The transition to full interstate banking was completed with passage of the Reigle-Neal Interstate Banking and Branching Efficiency Act of 1994, which effectively permitted banks and holding companies to enter another state without permission (see Kroszner and Strahan 2001b).

8.2.3 Deposit Insurance

Federal deposit insurance in the United States dates back to 1933, when Congress passed a series of laws designed to restore confidence in the financial and banking systems. Early debate over deposit insurance illustrates a clear understanding of the idea that while insurance could reduce bank runs and the associated disruptions to bank-loan supply, the cost of deposit insurance could be greater risk taking by banks (see, e.g., Kroszner and Melick 2008). This understanding reflected the experiences of earlier state-sponsored insurance and guarantee regimes during the nineteenth and early twentieth century. Half of the state-run bank note insurance systems set up before the Civil War were at times unable to meet their obligations. Later, eight states created deposit insurance systems between 1907 and 1917, and all eight systems failed during the 1920s due to excessive risk taking by banks in those states (Calomiris and White 2000). The legislation creating

the federal deposit insurance in the Great Depression itself was initially opposed by the Roosevelt administration and many of the major congressional leaders. Calomiris and White argue that federal insurance was ultimately adopted only because the general public, concerned about bank safety following the banking collapse in the early 1930s, became aligned with small and rural banks, the traditional supporters and main beneficiaries of deposit insurance.

Historical evidence suggests an important interaction between branching restrictions just described and the riskiness of banks, namely that branch banking lowered risk and increased stability, thereby reducing the call for deposit insurance. Gorton (1996) offers some unique evidence that markets understood the stabilizing effect of branch banking. He shows that during the nineteenth century when private banks issued currency, notes in circulation that were issued by new banks from branch banking states were discounted substantially less than notes issued by banks from unit banking states. Calomiris (1993) shows that both bank reserves and bank capital were lower in states with branch banking. He also studies bank failure rates in three states allowing branching but affected by the agricultural bust of the 1920s—Arizona, Mississippi, and South Carolina. Failure rates in these three states were much lower for banks with branches than those without. Comparing states that allowed branching with those that limited it, Calomiris (1992) also finds faster asset growth during the agricultural recession of the 1920s in states that allowed branching. And, as is widely recognized, the Canadian banking system, which contained a small number of large banks with nationwide branching, experienced no bank failures during the 1930s.[6]

Both political debate as well as some limited evidence from roll call voting patterns leading up to deposit insurance passage indicate that small and rural banks supported both restrictions on bank branching (to reduce competitive pressure from large banks) and deposit insurance (to increase deposit supply). By contrast, large and urban banks pushed for branch banking to allow them to compete with small banks directly, and generally opposed deposit insurance as a subsidy to small, poorly diversified banks. Calomiris and White (2000) compare bank characteristics in states with relatively high support for a federal insurance bill brought to a vote in 1913 (H.R. 7837). They show that banks were smaller (particularly state banks) and branching was less prevalent in states with high support.

Small banks won the political battle in the 1930s, and continued to win subsequent battles over the next several decades. Deposit insurance cover-

6. Dehejia and Lleras-Muney (2007) analyze the political economy of deposit insurance adoption from 1900 to 1940. After controlling for the endogeneity of the deposit insurance regime, they provide evidence of a negative relationship between the adoption of deposit insurance and growth, suggesting that such regimes may have impaired the efficiency of the banking system and capital allocation in these states.

age was increased in 1950 (from $5,000 to $10,000); in 1966 (to $15,000); in 1969 (to $20,000); in 1974 (to $40,000); and in 1980 with passage of DIDMCA (to $100,000). White (1998) argues that small banks supported each of these increases, while large banks opposed them. As a result, the real value of deposit insurance rose from $5,000 (in 1934 dollars) initially to $10,000 to $15,000 during the 1970s. Since 1980, deposit insurance coverage has remained flat, with inflation eroding its real value by about 50 percent over the past twenty-five years. Deposit insurance has also been expanding globally (Demirguc-Kunt and Kane 2002). Similar political forces seem to explain coverage levels across countries. For example, Laeven (2004) shows that coverage levels are higher in countries with weaker and riskier banking systems.

The large number of bank and thrift failures during the 1980s and early 1990s halted the increasing coverage of deposit insurance in the United States (see figure 8.2). During the 1980s, to take the most extreme example, the federal insurer of thrift deposits (the Federal Savings and Loan Insurance Association, or FSLIC) itself became insolvent. The S&L crisis had its roots in the basic lack of diversification of thrift assets (long-term mortgages financed with short-term deposits), coupled with regulators' failure to close market-value insolvent thrifts after the run-up of interest rates in the early 1980s. FSLIC was dismantled in 1989 when the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA) both recapitalized the

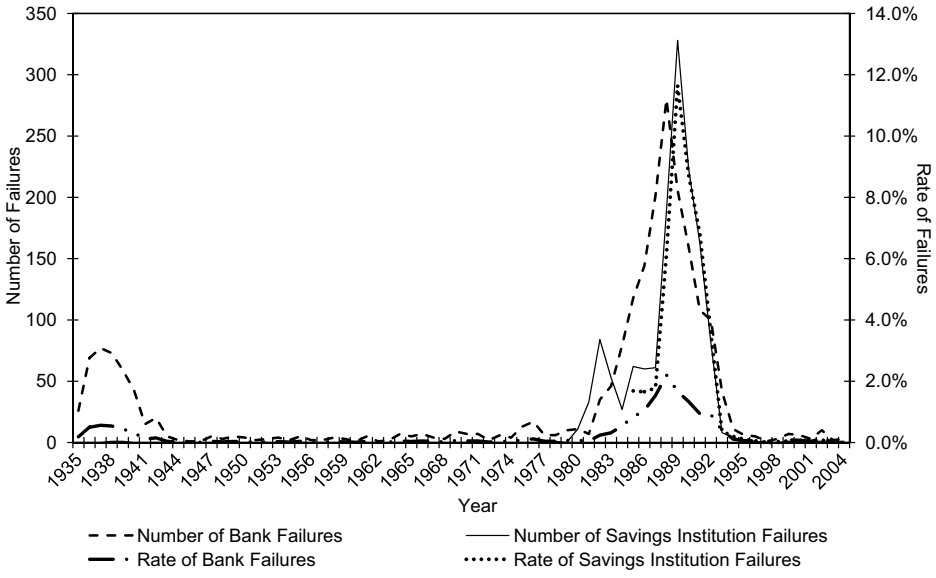

Fig. 8.2 Bank and savings institution failures
Source: FDIC.

Savings Association Insurance Fund (SAIF) and gave the FDIC responsibility for overseeing deposit insurance for thrifts.[7]

This very costly experience with deposit insurance led to reform in the early 1990s. The FDIC Improvement Act (FDICIA) of 1991 attempts to reduce the risk-taking incentives inherent in deposit insurance by introducing risk-based premiums and by directing the FDIC to resolve failed banks in the least costly way to the deposit insurance fund. The deposit insurance premia were required to generate sufficient revenue to reach a target ratio of 1.25 percent of deposits insured by the fund. The motivation behind the least-cost resolution provisions were the failure of large banks such as Continental Illinois and Bank of New England during the 1980s in which *all* creditors had been bailed out to avoid "systemic" disruptions. The comptroller of the currency even announced publicly after Continental Illinois that some large banks were "too big to fail."[8] This public announcement was quickly seen as unwise, and the 1991 law attempted to correct market perceptions that some banks were too big to fail and thereby reign in excessive risk taking incentives. Importantly, FDICIA also introduced "prompt corrective action" whereby regulators are required to respond swiftly and not exercise "forbearance" as institutions fall into trouble.[9]

In recent years, the tide has turned again, toward expansion of deposit insurance. In 2002, small banks began issuing fully insured certificates of deposit through the Certificates of Deposit Account Registry Service (CDARS). CDARS works through a network of banks whereby a customer's large deposits are split up and placed as accounts under the $100,000 deposit insurance limit at bank members of the system. Thus, large depositors can effectively get around deposit insurance limits. At the same time, pressure for extended *de jure* coverage seems to be coming from small banks. For example, the Independent Community Bankers Association "has been in the forefront of the campaign for comprehensive Federal deposit insurance reform including automatic inflation adjustments of coverage levels. In the 24 years since FDIC coverage was last adjusted, inflation has eroded away more than half its value. The stability of our financial system depends on consumer confidence that their funds will be protected. We are working with key Members of Congress to make comprehensive deposit insurance reform with automatic inflation adjustments a reality."[10]

At the same time, bank deposit growth has pushed the Bank Insurance Fund to near the 1.25 percent reserve threshold, potentially triggering assess-

7. Much has been written about the S&L crisis of the 1980s, and we will not review that very large literature here. See, for example, Kane (1989), Kroszner and Strahan (1996), White (1991).

8. Stock prices of those banks listed in the *Wall Street Journal* as "too big to fail" rose upon hearing the comptroller's unwillingness to close them (O'Hara and Shaw 1990).

9. Mitchener (2007) analyzes different state regulatory regimes during the Great Depression and finds that states allowing supervisors to liquidate troubled banks quickly had less bank instability than other states.

10. See http://www.ibaa.org/advocacy/.

ments for deposit insurance for even highly rated institutions. The prospect of these assessments, along with small-bank advocacy of increasing deposit insurance coverage, led to the passage of the Federal Deposit Insurance Reform Act of 2005. The act is part of the Deficit Reduction Act of 2005 (S 1932) that was signed into law on February 8, 2006. The act creates a new Deposit Insurance Fund (DIF) that merges the old Bank Insurance Fund with the Savings Institution Insurance Fund, increases deposit insurance for retirement accounts to $250,000, provides for the adjustment of deposit insurance limits for inflation beginning in April 2010, and, perhaps most importantly, increases the FDIC's flexibility in setting risk-based premiums. Constraints on risk-based premiums remain, however, because once the new DIF reserve fund reaches 1.35 percent of total insured deposits, dividends must be paid to member institutions so that the reserve ratio does not exceed this threshold.

8.2.4 Product-Line Restrictions

Explicit restrictions prohibiting bank involvement in underwriting, insurance, and other "nonbank" financial activities began with the passage of the Banking Act of 1933. The four sections of the act that separate banking and nonbanking activity—16, 20, 21, 32—are collectively known as the Glass-Steagall Act (Mester 1996). The Bank Holding Company Act of 1956 (and the amendment to the act in 1970) further strengthened the demarcation between banks, insurance, and securities firms. It was not until the mid-1980s that the Federal Reserve and the Office of the Comptroller of Currency (OCC) began loosening restrictions on bank participation in investment banking and insurance.

Even though concerns about the stability of the banking system would be a rationale for the continuation of the Glass-Steagall separations subsequently, such considerations did not form an important part of the debate in 1933. Banks that were involved in underwriting securities tended to be larger and better diversified than other banks and were less likely to fail during the 1930s (see White 1986). Instead, the main focus of the debate on bank powers concerned conflicts of interest. With their close relationships with firms, bankers might have an information advantage relative to the market about the prospects for a firm. If a bank knows that a firm may be heading for distress before the market does, a bank that succumbs to conflicts would issue a security to the public and have the firm use the proceeds to repay its loans to the bank. A number studies of bank underwriting behavior during the 1920s and 1930s, however, have found little evidence to suggest that such conflicts were important in practice (see Kroszner and Rajan 1994 and 1997; Ang and Richardson 1994; Puri 1996).[11]

11. On the political economy of the origins of Glass-Steagall, see Macey (1984) and Shughart (1988).

Although Glass-Steagall and the subsequent Banking Acts of 1956 and 1970 disallowed underwriting by banks and bank holding company (BHC) affiliates, certain securities, deemed "eligible" securities by regulators, were exempted from the original act, and were therefore never in question by regulators. These eligible securities included municipal general obligation bonds, US government bonds, and real estate bonds (Kwan 1998).

The Federal Reserve began the expansion of BHC powers with a decision in 1987 to allow subsidiaries of three BHCs to underwrite certain previously prohibited securities on a limited basis.[12] The Federal Reserve derived legal authority for the decision from a clause in Section 20 of the 1933 Banking Act that prohibits banks from affiliating with a company "engaged principally" in underwriting or dealing securities (Mester 1996). On April 30, 1987, the Federal Reserve argued that the "engaged principally" clause allowed BHC subsidiaries to underwrite certain "ineligible securities" such as municipal revenue bonds, commercial paper, and mortgage-related securities as long as the revenue from such underwriting did not exceed 5 percent of the subsidiary's gross revenue (Bhargava and Fraser 1998).

On January 18, 1989, the Federal Reserve allowed the "Section 20 subsidiaries" to underwrite corporate debt and equity securities contingent on the 5 percent revenue limitation. The Federal Reserve continued its incremental lifting of restrictions by increasing the revenue limit on Section 20 subsidiaries to 10 percent on September 13, 1989 and to 25 percent on December 20, 1996 (Bhargava and Fraser 1998; Ely and Robinson 1998). To relax this revenue restriction further, banks also placed other activities, such as those related to government securities, in these subsidiaries.

Throughout the debate on BHC involvement in nonbank financial operations, the Federal Reserve enforced firewalls between banking and nonbanking activity within the subsidiary structure of the BHC. These firewalls were instituted to prevent financial and information flows between securities and banking subsidiaries, and to insulate banking activity from unforeseen shocks to nonbank activity (Shull and White 1998). For example, bank lending to nonbank subsidiaries was limited, and restrictions were placed on payments from banks to the holding company (Boyd and Graham 1986). Beginning in July of 1996, the Federal Reserve began loosening the barriers between banking and nonbanking activities. Interestingly, similar firewalls had emerged endogenously during the 1920s as investment companies affiliated with banks sought to commit credibly to markets not to abuse private information from lending relationships (Kroszner and Rajan 1997).

While the Federal Reserve oversaw BHC expansion into securities, OCC rulings backed by the federal courts simultaneously loosened restrictions on national banks' insurance activity. These regulatory changes allowed

12. See Kroszner and Stratmann (1998, 2000) and Stratmann (2001) on the politics behind legislation aimed at removing restrictions on Glass-Steagall.

BHCs to make some inroads into nonbanking financial services. Lown et al. (2000) show, for example, that BHCs' percentage of the securities industry's aggregate revenue went from 9 percent in 1993 to over 25 percent in 1999. Bhargava and Fraser (1998) report similar findings, and show that bank underwriting activities broadened considerably and included a full range of debt and equity issues. Lown et al. (2000) also show that BHCs greatly expanded annuity sales after the 1995 Supreme Court decision (*Nationsbank v. VALIC*) ruling that states could not prohibit the sales of annuities by national banks (which we describe in more detail in section 8.4). Although BHCs were exploring the insurance sales sector, the authors show that BHC involvement in the insurance market remained small, in part because strict barriers between insurance underwriting remained a significant impediment to the joint production of cross-sector financial services.

Congress finally completed the dismantling of Glass-Steagall altogether by passing the Financial Modernization Act in 1999, which allows financial holding companies (FHCs) to own affiliates engaged in banking, insurance underwriting, and securities activities. The act, known also the Gramm-Leach-Bliley Act or GLBA, was passed a little more than six months following the merger of Citicorp and Travelers, which formed the first full-service financial conglomerate in the United States since the 1920s.

While the newly formed Citigroup has subsequently divested much of its insurance holdings, the lines between commercial and investment banking have become increasingly blurred during the past five years. As figure 8.3 shows, for example, financial conglomerates have come to dominate the

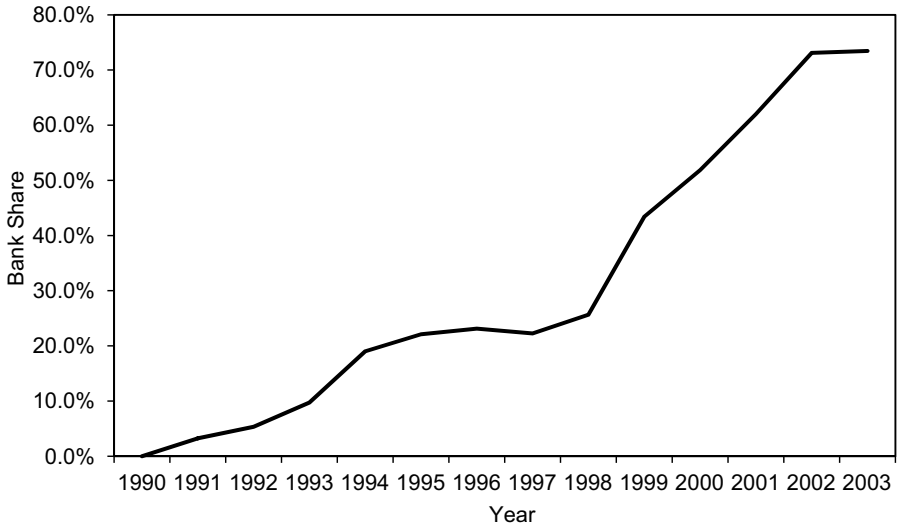

Fig. 8.3 Share of corporate debt underwritten by commercial banks
Source: Sufi (2005).

market for debt underwriting (see Sufi 2005). In 1996, the top five debt underwriters were all stand-alone investment banks (Morgan Stanley, Salomon Brothers, Goldman Sachs, Merrill Lynch, and First Boston). By 2003, however, four of the top five underwriters were owned by full-service financial conglomerates (Citigroup, JPMorgan Chase, Bank of America, Merrill Lynch, and Credit Suisse). At the same time, traditional investment banks have made inroads into commercial lending. According to Loan Pricing Corporation, for example, Goldman Sachs ranked seventh and Lehman Brothers ranked ninth in arranging syndicated loans during the first half of 2005.[13]

This convergence offers a striking parallel between recent times and the 1920s, particularly with respect to pressures on commercial banks to become more involved in the corporate securities markets (Kroszner 1997). One of the most notable developments then was the increasing frequency with which firms accessed the public equity and debt markets. The volume of new equity issues grew during the 1920s, skyrocketing in late 1928 and 1929. The 1980s also was a period that witnessed a dramatic increase in the number of initial public offerings (IPOs). The number of IPOs nearly tripled from the 1970s to the 1980s, from an average of 120 per year to an average of 350 per year (Loughran and Ritter 1995).

More firms also were beginning to use bond financing in both periods. Smaller and lesser known firms were enjoying new access to the bond markets in both the 1920s and 1980s. With the entrance of a new class of firms, the average rating of corporate bonds declined. The proportion of bonds that were initially rated below investment grade rose steadily during the 1920s, from 12 percent in 1921 to 43 percent by 1929 (Kroszner and Rajan 1994). The same phenomenon occurs during the 1980s with the growth of original issue high-yield debt (so-called junk bond) market. The number of initially rated below investment grade bonds grew from 24 in 1981 to 200 by 1986, and the amount issued rose from $1.2 billion to $30.9 billion during this period (Asquith, Mullins, and Wolff 1989).[14]

With the growth of the public markets as a source of funds for firms came a corresponding decline in reliance on commercial bank borrowing. In addition, banks were facing greater competition from other financial institutions. As table 8.2 illustrates, commercial bank share of the total assets of US financial institutions had held steady at 60 to 65 percent from 1880 to 1922. Commercial banks then experienced a sharp decline in share between 1922 and 1929 to 54 percent, while investment companies (i.e., mutual funds), securities brokers and dealers, finance companies, and insurance companies

13. See http://www.loanpricing.com/.

14. The "junk bonds" of the 1980s often had equity-like characteristics, so it is possible to interpret the turning toward equity and away from debt in the late 1920s as a form of this type of financing.

Table 8.2 **Percentage shares of assets of financial institutions in the United States, 1860–2004**

	1860	1880	1900	1912	1922	1929	1939	1948	1960	1970	1980	1993	2004
Commercial banks	71.4	60.6	62.9	64.5	63.3	53.7	51.2	55.9	38.2	37.9	34.8	25.4	24.4
Thrift institutions	17.8	22.8	18.2	14.8	13.9	14.0	13.6	12.3	19.7	20.4	21.4	9.4	6.7
Insurance companies	10.7	13.9	13.8	16.6	16.7	18.6	27.2	24.3	23.8	18.9	16.1	17.4	15.2
Investment companies	—	—	—	—	0.0	2.4	1.9	1.3	2.9	3.5	3.6	14.9	21.7
Pension funds	—	—	0.0	0.0	0.0	0.7	2.1	3.1	9.7	13.0	17.4	24.4	21.7
Finance companies	—	0.0	0.0	0.0	0.0	2.0	2.2	2.0	4.6	4.8	5.1	4.7	4.2
Securities brokers and dealers	0.0	0.0	3.8	3.0	5.3	8.1	1.5	1.0	1.1	1.2	1.1	3.3	5.3
Mortgage companies	0.0	2.7	1.3	1.2	0.8	0.6	0.3	0.1	[a]	[a]	0.4	0.2	0.1
Real estate investment trusts	—	—	—	—	—	—	—	—	0.0	0.3	0.1	0.1	0.7
Total (*percent*)	100	100	100	100	100	100	100	100	100	100	100	100	100
Total (*trillion dollars*)	.001	.005	.016	.034	.075	.123	.129	.281	.596	1.33	4.0	13.9	34.9

Sources: Data for 1860–1948 (except 1922) from Goldsmith (1969, table D-33, pp. 548–49); data for 1922 from Goldsmith (1958, table 10, pp. 73–74); and data for 1960–1993 from Board of Governors of the Federal Reserve System, "Flow of Funds Accounts," various years.

Notes: The table is expanded from Kaufman and Mote (1994). Assets held by government-sponsored enterprises and asset-backed securities issuers are not included.

[a]Data not available.

grew in share.[15] Between 1980 and 2004, commercial banks again saw a sharp drop in their share, which had held relatively steady between 1960 and 1980 at between 35 and 38 percent, to 24 percent by 2004.

One additional comparison and contrast between the economic and financial conditions of the 1920s and 1980s is of note (see Kroszner 1997).[16] Both decades began and ended with recessions and had a lengthy period of economic growth in between. The recession at the beginning of the 1920s, like the one at the beginning of the 1980s, was sharp and short lived. Both periods witnessed a major stock market crash (October 1929 and October 1987) toward the end of each period. The economic downturns that ended each decade were decidedly different—one was the start of the Great Depression whereas the other was quite mild. Both cases, however, were accompanied by a major wave of depository institution failure and closure. The banking problems in the Great Depression were system wide and led to a near collapse of the entire financial system (see e.g., Friedman and Schwartz 1963; Calomiris and Mason 2003), whereas the troubles in the thrift and banking industries in the 1980s and early 1990s, while considerable, did not have the same consequences (see, e.g., Barth 1991; Kane 1989; Kroszner and Strahan 1996; and White 1991).

The difference in the severity of the end-of-decade downturns and banking problems can account for at least part of the sharp contrast in the bank regulatory response in 1933 compared to the opposing deregulatory response that began in the 1990s (discussed in section 8.4). In the early period, Congress began seriously to debate the restriction of bank powers soon after the stock market crash. Three years later, these restrictions were enacted in the first hundred-day wave of New Deal legislation as part of a broad bill to reform the banking system, including the creation of federal deposit insurance.

8.2.5 Restrictions on Pricing

Regulations have historically constrained pricing of both bank deposits and bank loans. Ceilings on bank deposit interest rates, for example, were in effect into the early 1980s under the Federal Reserve's Regulation Q. During periods when market interest rates rose above these ceilings, banks and other depositories faced reduced deposit supply, forcing them to cut back on lend-

15. As Boyd and Gertler (1994) and Kaufman and Mote (1994) note, a reduction in the share of assets of all financial institutions itself does not address the broader issue of whether the banking industry is in decline.

16. One significant factor today that was not operative in the 1920s is the Basel Bank Capital Accord, which provides an incentive for banks to hold relatively more (government) securities than loans on their books. Unlike the early period, during the late 1980s and early 1990s, the increase in securities holdings was primarily in terms of government rather than corporate issues. By raising and risk adjusting the minimum capital requirements and giving government securities a zero "risk weight," the Basel Accord has given banks a strong incentive to increase their holdings of government securities.

ing. This disintermediation became acute during the 1970s as market rates soared in response to high inflation and loose monetary policy. Moreover, the costs of holding noninterest bearing required reserves at bank members of the Federal Reserve System rose sharply with inflation. In response to the plight of banks (as described more in the political economy section below), Congress passed the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) in 1980, which lowered reserve requirements and gradually phased out most deposit rate ceilings. DIDMCA substantially leveled the competitive playing field across depository institutions by imposing uniform reserve requirements and access to Federal Reserve services, and by allowing banks to pay interest on NOW accounts nationwide (checkable deposits).

On the lending side, usury laws restricting the rates banks may charge date back to the colonial period in the United States and have a very long history before that (e.g., Ellis 1998; Glaeser and Scheinkmann 1998). Conventional interpretation of these laws is that they exist to protect politically powerful borrowers. Consistent with this view, Benmelech and Moskowitz (2007) find that states with more powerful incumbent elites tended to have tighter usury restrictions and responded less to external pressure for repeal. In contrast, Glaeser and Scheinkmann (1998) argue that the pervasiveness of usury restrictions across the world, as well as their persistence over time, implies that such laws exist to reduce the impact of incomplete credit markets. In their model, agents borrow to smooth consumption in the face of negative income shocks, and usury laws transfer wealth to such low-income states, thus moving toward optimal risk sharing.

The importance of state usury laws was permanently reduced in 1978 when the Supreme Court undermined states' ability to enforce them in the *Marquette National Bank v. First Omaha Service* case. The court ruled that Section 85 of the National Banking Act allowed a lender to charge up to the maximum amount allowed in its home state, *regardless of the location of the borrower*. Because credit card lending is not geographically based (in contrast to small business lending), this decision created an incentive for states to raise their usury limits to compete for banks. In fact, Delaware and South Dakota eliminated them entirely, leading to rapid entry of credit card banks in those two states. By 1988, eighteen states had removed interest rate ceilings, and the supply of credit card loans expanded rapidly over the subsequent twenty years. This increase in supply was concentrated most among high-risk borrowers because the interest rate ceilings restrict credit most among that segment of the market. As a consequence, personal bankruptcy rates began a long and steady increase, starting in 1978 with the *Marquette* decision (see figure in Ellis 1998).[17]

17. Recent tightening of the personal bankruptcy code has occurred in part to reduce personal bankruptcy rates.

DIDMCA of 1980 also relaxed some constraints on usury ceilings. Although state usury ceilings continue to be in place in most states, they are generally not indexed to inflation, so in the recent low inflation environment they have not been binding on traditional bank lending. For "subprime" borrowers who may be riskier, however, the ceilings may still bind in some circumstances. Credit to subprime borrowers from alternative financial institutions, such as pawn shops and payday loan companies, also are subject to interest rate ceilings. Payday lenders, which provide small-value short-term loans (typically under $300 for roughly two weeks), typically charge annualized interest rates that are at the state level maximum (see Flannery and Samolyk 2005).

8.2.6 Regulation of Bank Capital

Regulations designed to ensure sufficient capital in the banking industry date to the nineteenth century. The grant of a bank charter typically came with a requirement for a minimum absolute amount of capital. Regulations of bank capital-asset ratios did not emerge until the 1980s, however, after capital ratios in the banking industry had reached historical lows. In fact, leverage ratios in the US banking system increased gradually but consistently, starting in the nineteenth century until the early 1980s. Part of the increase in leverage is due to the introduction of deposit insurance during the Great Depression, but part is likely due to increased bank size and diversification, as well as better risk management practices that evolved over time (see Peltzman 1970).

In the past two decades, regulations dictating minimum capital-asset ratios (maximum leverage ratios) have become increasingly complex and comprehensive. Banks first faced minimum requirements based on the raw ratio of equity capital to total assets. These regulations, however, were quickly seen as inadequate as a greater share of bank business was associated with off-balance sheet activities such as credit guarantees and unfunded loan commitments (Boyd and Gertler 1994). These off-balance sheet activities came with a sharp increase in bank revenues from noninterest sources (Mishkin and Strahan 1999), and also represented an important component of bank risk that was not measured at all by total assets or loans. The 1988 Basel Capital Accord addresses this changing nature of banking (or bank accounting) by including off-balance sheet exposures and by accounting for credit risk in constructing risk-based assets. Under the simple scheme, loans with different risks face different marginal capital requirements. For example, banks had to fund business loans with at least 8 percent capital, whereas residential mortgages could be funded with only 4 percent capital. The 1988 accord also addressed perceived inequities in capital requirements across countries, and attempted to level the competitive playing field for internationally active banks.

During the past decade, banks have adopted increasingly sophisticated

risk management models, and these new financial technologies have spurred changes to capital requirements. For example, new capital requirements for market risks were adopted using banks' internal risk measurement models in 1996. The key innovation leading to the regulatory change was the introduction of value-at-risk models (e.g., JP Morgan's *RiskMetrics* model), which estimate quantiles of profit and loss distributions for bank trading positions. These models are useful because they quantify the likely magnitude of bank losses during "normal" market conditions, such as conditions covering 99 percent of trading days, and sophisticated versions of such models can avoid making strong distributional assumptions (Jorion 2000).

Following the successful introduction of market risk capital requirements, international bank regulators began to negotiate a more complex and comprehensive capital regime. Referred to as Basel II, this new accord has three "pillars" that focus on trying to update capital requirements, ensure effective regulatory supervision, and enhance the role of market discipline (see Bank for International Settlements 2005). The simple risk adjustment approach in the original accord was seen as no longer adequate to deal with market developments.

As with both the 1988 accord and the 1996 Market Risk Amendment, the move to update the capital requirements has been driven by advances in financial technology. For example, innovations such as securitization and credit derivatives in the late 1990s have made it easier for banks to trade risk, but such trading allows banks to undermine the simple measurement of asset risk behind the 1988 accord (e.g., Calomiris and Mason 2004). At the same time, credit risk measurement tools similar to those used for market risk have become increasingly available. Thus, the capital required under Basel II will depend on model-based construction of the main dimensions of risk (market, operational, and credit risks), and the system is designed to encourage banks to develop internal models rather than rely on externally imposed supervisory models. In the United States, the new accord is likely to apply to only the largest banks that compete internationally, and the minimum leverage ratio (which does not involve risk adjustment of the assets) from the original accord will still apply.

It is important to recognize that capital regulations not only respond to changes in financial technology but may also spur such innovations. For example, efforts to avoid capital may in part explain the rise in off-balance sheet banking during the 1980s. Similarly, the 1988 accord may have encouraged banks to securitize loans in order to reduce required capital ratios, and to trade risks via products such as credit default swaps.

8.3 Consequences of Regulation and Deregulation

This section describes the consequences of banking regulations for the financial industry and for the economy. Much of our understanding of these

effects comes from research examining how the banking system evolves following regulatory changes, which are concentrated in the period of regulatory tightening during the early 1930s, and the deregulatory period of the 1980s and 1990s. As we describe, the increased regulations of banking and the securities markets in the 1930s was followed by a decline in securities markets. Later, "market adaptation" generated alternative and less tightly regulated financial institutions to get around regulatory constraints and provide services to investors that had previously been rendered by banks.

The experience of the last two decades has reversed the process. Regulations on banks and markets have eased, and this deregulation has occurred in part in response to the emergence of competing financial institutions during the earlier period. Despite market adaption that likely mitigated the costs of the 1930s regulations, the recent wave of deregulation was followed by substantial restructuring of banking leading to greater efficiency, improved credit access, and better economic performance in some areas, but the development of shadow banking and opaque interconnections increased the fragility of the system.

8.3.1 Consequences of "Market Adaption" after Glass-Steagall: Rise of Alternative Institutions

Decline of Securities Markets

The Glass-Steagall Act of 1933 effectively precluded banks from underwriting corporate securities (see Macey and Miller 1992), but for almost two decades after its enactment, the securities markets saw much less activity than in the 1920s. Almost no corporate securities were issued between 1932 and 1935, even though the industrial production was rebounding strongly from the depths of 1932. Although the economy was recovering, output was still below its 1928 peak so there may not have been much desire on the part of firms to issue securities to finance operations. Alternatively, the removal of the commercial banks from underwriting and the new federal regulation of securities market through the Securities Acts of the 1930s could have increased the cost of securities issuances to prohibitive levels.

Even after the public issuance market revives a bit by the late 1930s, total issuance remained below the levels following World War I. During the 1930s and much of the 1940s, however, there was an enormous increase in government bond issuance. The growth of this market was favorable to commercial banks because they played a major role in this market. As shown in table 8.2, from the late 1930s to the late 1940s, commercial banks actually increased their share of total assets held by financial institutions. By the early 1950s, the corporate securities markets were once again reviving and beginning to pose more of a challenge to bank lending. This situation led some bankers to attempt to avoid the Glass-Steagall prohibitions and reenter the securities

markets through a holding company structure. The Bank Holding Company Act of 1956, and its subsequent amendments in 1966 and 1970, thwarted this movement by effectively extending the Glass-Steagall restrictions on banks to holding companies that had banking subsidiaries (see Blair 1994).

Market Adaptation: The Growth of Alternative Financial Institutions and "Shadow Banking"

Until the 1980s, as noted earlier, US commercial banks were effectively prohibited from universal banking following the 1930s legislation. This situation contrasts sharply with Germany, and to some extent Japan, where banks are able to play a much more central role in the financing of private enterprise (see Edwards and Fischer 1994; Aoki and Patrick 1994). Interestingly, a variety of other financial organizations have arisen in the United States that can be interpreted as a means of filling the gap that is the legacy of Glass-Steagall. The organizations discussed following are much more developed in the United States than in other countries, perhaps stimulated by Glass-Steagall. If we are to look for the silver lining in the cloud of Glass-Steagall, the richer variety of alternative sources of funds for enterprise that the United States has relative to other countries could be it.

As table 8.2 illustrates, there are a number of important financial actors in the United States besides commercial banks.[18] Pension funds, insurance companies, and investment companies (i.e., open- and closed-end mutual funds), for example, have come to control large shares of the total assets in financial institutions in the United States. Firms therefore have a rich variety of funding sources. Each set of financial institutions has a distinct set of regulations and a distinct set of interests. These institutions compete to influence financial legislation and regulation (see Kroszner and Stratmann 1998 and 2000), and the regulatory agencies themselves may compete to increase their domains of influence (see Kane 1989). Expanding banking powers in such an environment is unlikely to cause one group to capture all of the financial regulators and use them to impede competition.

In the post–World War II era, a variety of alternative organizations and contractual structures have arisen in the United States that, at least in part, substitute for a universal bank.[19] Perhaps the alternative that has been able to come closest is the venture capital (VC) organization. The first modern VC organization dates back to 1946 when a group of Boston investors formed American Research and Development to invest in firms adapting

18. Kaufman and Mote (1994) note that ignoring the trust services of banks, as the table does, may significantly understate the actual overall share of commercial banks.

19. Jensen (1989) has argued that these alternatives arose directly in response to restrictions like Glass-Steagall. Also note that this now broadens the definition of universal banking to include ownership and active monitoring roles by the banks rather than simply corporate securities dealing and underwriting.

war-related technological innovations for commercial use (Gompers 1994; Gompers and Lerner 1996).

The VC industry, however, did not begin to grow rapidly until the late 1970s. In 1979, the "prudent expert" standard that governs permissible investments for pension funds was broadened to allow pension funds to invest in VC funds.[20] This change was extremely important since the regulations associated with ERISA (Employee Retirement Income Security Act) discourage pension funds from directly becoming "active investors," that is, investors who participate in both the financing and management of an enterprise (see Roe 1994). Following the change in the "prudent expert" standard, annual investment in VC funds grew substantially.

The VC form has been a method for pension fund managers and other fund managers to pool their resources in VC funds and act indirectly as active investors. VC funds typically provide not only equity and debt financing but also management expertise and strategic consulting, activities that regulations and tax incentives strongly discourage the pension funds and investment companies themselves from doing (Roe 1994). The VC industry has helped to finance numerous start-up firms that then go public so it has an important effect on the growth of the IPO market.

Another closely related form, the leveraged-buyout organization (LBO), also has had a large impact on corporation finance and restructuring, especially during the 1980s (see Jensen 1989). Much like VC, LBO organizations take debt and equity stakes in firms and become active in the management of the firm. Unlike VC, they purchase existing firms or divisions of firms, typically by using debt to purchase equity, thereby increasing the financial leverage of the enterprise. LBOs involving the purchase of public companies rose from 16 in 1979 to a peak of 125 in 1988, and the annual dollar volume grew from $65 million to nearly $500 million (see Jensen 1989). Jensen (1989) has argued that LBOs are effectively a form of universal banking that is an "end-run" around Glass-Steagall. Starting in the late 1990s, hedge funds have also emerged as an important pool of (unregulated) capital invested in private equity.

This process of market adaptation accelerated in the 2000s with the rapid growth of what has come to be called the "shadow banking" sector, constituting a variety of nonbank institutions and markets that compete with and are connected to the banking system. Much of this market adaptation involved regulatory arbitrage to create vehicles, institutions, and products that would avoid or reduce regulatory capital burdens and oversight, setting the stage for fragilities of the financial crisis of the late 2000s, which we discuss in the epilogue.

20. In addition, in 1978 the tax rate on capital gains was reduced from 49.5 percent to 28 percent, thereby making VC more attractive for taxable investors also.

8.3.2 Real Impact of Recent Financial Deregulation

The Structure of the Banking Industry

Deregulation of restrictions on geographical expansion and product lines has led to a more consolidated but less locally concentrated banking system dominated by larger and better diversified banking organizations that compete in multiple markets. Relaxation of restrictions on bank expansion during the 1980s (removal of branching and interstate banking restrictions) led to larger banks operating across wider geographical areas. The effects of this deregulation on industry structure can be seen graphically in the next few figures.

The number of institutions, which remained almost constant for half a century, begins to fall dramatically starting in the early 1980s, just as states began to dismantle restrictions on geographic expansion (figure 8.4). The reduction in the number of banks occurs primarily through mergers. As figure 8.5 shows, the rate of bank mergers rises consistently from roughly 1980 until the end of the 1990s. This decline of more than 40 percent in the number of banks reflects an industry restructuring made possible by deregulation, rather than removal of "excess" banking capacity. In fact, as figure 8.4 illustrates, the number of bank offices increases steadily throughout the 1980s and 1990s—rising by more than one-third—despite the consolidation. Moreover, the rate of *de novo* banking (new charters) is high on average during the 1980s and 1990s (figure 8.5).

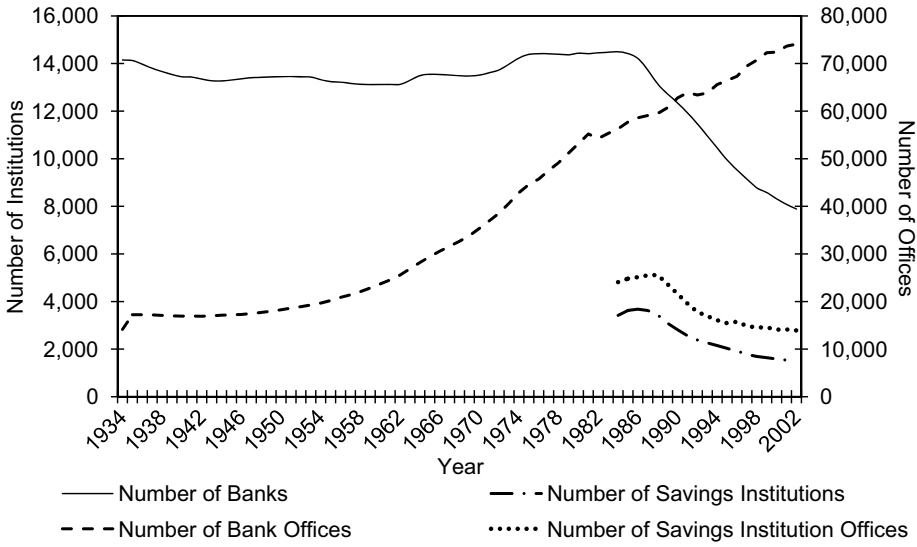

Fig. 8.4 Number of bank and savings institutions and offices
Source: FDIC.

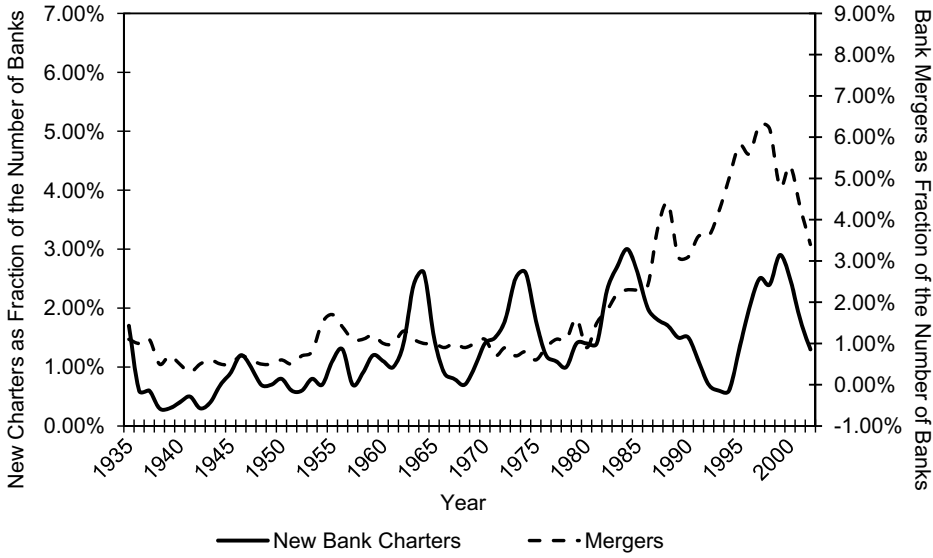

Fig. 8.5 Entry and consolidation of banking
Source: Five-year moving average, from FDIC data.

The number of savings institutions also shrank over this period (see figure 8.4), but the decline occurs mainly in response to the S&L crisis. During the second half of the 1980s the annual failure rate for savings institutions reached almost 10 percent of institutions per year (recall figure 8.2). Following this decline, the banking industry began purchasing large numbers of branches from failed savings institutions and began holding more residential mortgages. Moreover, during the 1990s, the government-sponsored enterprises (GSEs)—the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac)—began to play an increasingly important role in holding and securitizing mortgages, as shown in figure 8.6. In 1985, for example, about 25 percent of the outstanding mortgages were either purchased and held or purchased and securitized by the GSEs. By 2003, this market share had increased to about 50 percent.[21]

Following passage of the Riegle-Neal Interstate Banking and Branching Act in 1994, the US banking system has been transformed from a "balkan-

21. Policymakers have voiced concerns about the resulting expansion of interest rate risk at the GSEs (Greenspan 2004). Passmore, Sherlund, and Burgess (2005) argue that most (but not all) of the benefits of GSE-subsidized borrowing benefits their shareholders rather than mortgage borrowers. Loutskina (2011) and Loutskina and Strahan (2009) show, however, that securitization fostered by GSE activities helps banks manage their liquidity risk and reduces the impact of financial constraints on bank-loan supply.

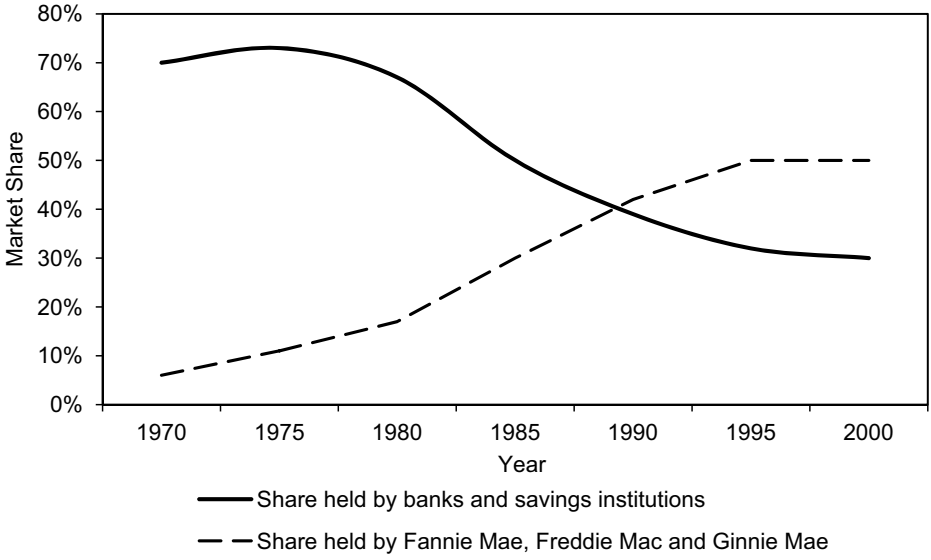

Fig. 8.6 Mortgage holdings by depository institutions and government-sponsored enterprises
Source: Frame and White (2005).

ized" one in which institutions operated locally or within a state to a system that is nationally integrated. This integration is primarily a result of the emergence of multistate banking organizations that can take advantage of operating branches across state lines. Figure 8.7 illustrates this transformation. The number of multistate banks rises from only 10 in 1994 to 387 in 2005. Over this period, the number of branches in interstate organizations rises from 328 to more than 28,000, which now comprise almost 40 percent of all banking offices.

Because the consolidation of the system involved national integration, the dramatic reduction in the number of banks did *not* increase local banking-market concentration or market power. Restrictions on branching and interstate banking generally did not constrain banks' ability to expand *within* local markets, with the exception of the unit banking states. Thus, deregulation allowed banks to enter *new* local markets by buying banks or branches, but it did not spur banks to consolidate within markets. Banks could do that all along in most states.

Figure 8.8 illustrates the trend in banking concentration starting in 1975. We measure concentration with the Herfindahl-Hirschmann Index (HHI), based on deposits. The HHI equals the sum of squared market shares (times 10,000), where shares are based on branch-level deposit data from the Federal Deposit Insurance Corporation's *Summary of Deposits*. We define

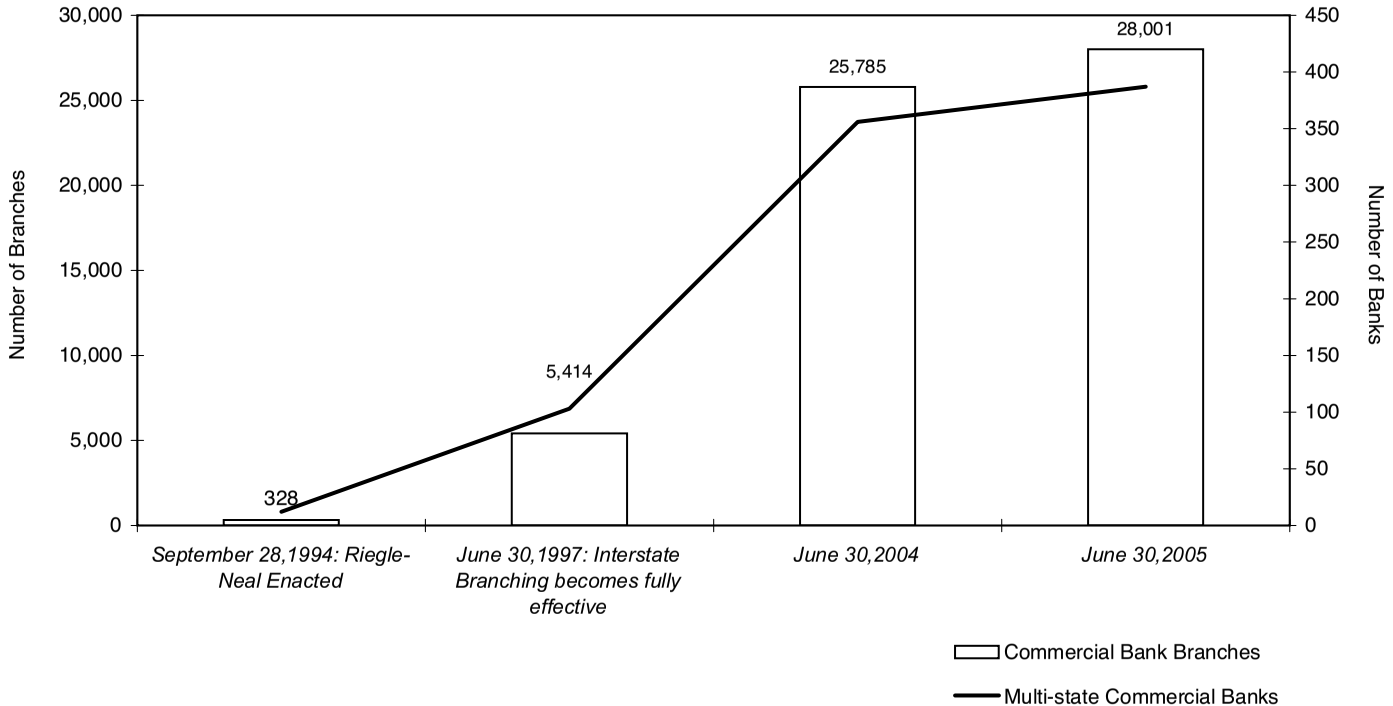

Fig. 8.7 Number of interstate branches operated by FDIC-insured commercial banks and number of multistate banking organizations, 1994–2005

Source: FDIC Summary of Deposits (2005).

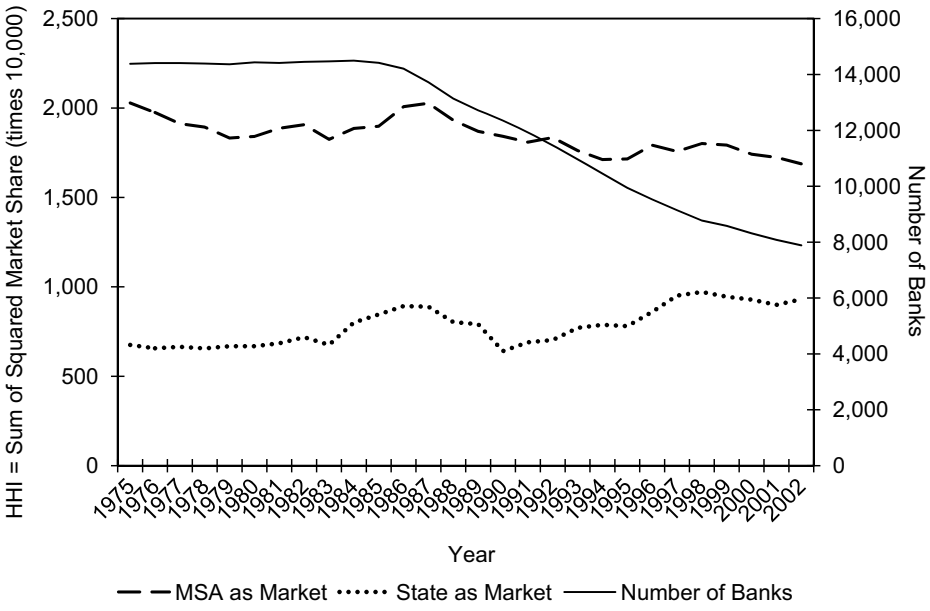

Fig. 8.8 State and local banking market concentration
Source: Authors' calculations and Dick (2006) based on data from FDIC.

"market" either locally (metropolitan statistical area) or at the state level. As the figure shows, while the number of banks falls off sharply, local concentration remains flat or even falls. Concentration measured over states rises only slightly during the 1980s and 1990s.[22] Thus, the net effects of these structural changes has been fewer, but larger and better diversified banks are operating across more local markets with more branches.

These broad trends suggest but do not demonstrate definitively that deregulation altered the structure of banking markets; concurrent macroeconomic and/or technological factors could explain these changes to some degree. Most of the deregulation during the 1980s and 1990s occurred through state-level actions. Because this deregulation occurred at different times in different states, we can study how both within-state branching and interstate banking affected banking structure, as well as the real economy, after controlling for time trends. To explore systematically how these reforms affected banking and the economy, we report a set of regressions using the following unified framework:

$$(1) \qquad y_{st} = \alpha_t + \beta_s + \gamma^1 \textit{Within-state branch deregulation}_{st} + \gamma^2 \textit{Interstate-banking deregulation}_{st} + \varepsilon_{st},$$

22. Concentration at the national level, however, has increased substantially.

where s indexes states; t indexes time; y_{st} is a set of dependent variables (measures of banking market structure and economic performance); α_t is a year-specific fixed effect (estimated by including year indicator variables); β_s is a state-specific fixed effect (estimated by including state indicator variables); *Within-state branch deregulation*$_{st}$ is an indicator set to one after a state permits a bank or bank holding company to buy branches throughout the state; and, *Interstate-banking deregulation*$_{st}$ is an indicator set to one after a state permits banks from other states to enter that state.[23]

Due to the cross-state and over-time variation in the regulatory status of different states, both unobserved state differences and aggregate shocks (and any trends) can be fully absorbed with the inclusion of state and year fixed effects, while leaving sufficient variation in the regulatory variables to estimate their effects on state-level structural and economic performance variables (y_{st}). Moreover, by using the state rather than the firm as the relevant unit of observation, the resulting panel data set is balanced because states do not enter or exit the sample. Thus, there is no need to worry about (or attempt to correct for) survivorship biases that can plague attempts to draw inferences from bank-level or firm-level data.[24] The coefficients on the deregulation indicators reflect state-specific *changes* in the dependent variable following deregulation.

As we describe below, aggregate trends in technology affected all financial services firms and created increasingly strong pressures for regulatory regime change; interest group factors within financial services can account for differences in the *timing* of state-level deregulation. Hence, a cross-sectional comparison of banking structure or state growth performance might be misleading, or at least difficult to interpret. For example, consider comparing states in a single year, say 1987. If states permitting interstate banking had more large banks than states that did not yet permit interstate banking in 1987, it could be that regulation led to structural changes favoring large banks (i.e., regulation caused the structural change). Or it could be that states with more large banks deregulated before states with fewer large banks (i.e., regulation was caused by the cross-state differences in structure).

The estimators reported here are not likely to be affected by the political economy factors. By including the state fixed effects in the model, all of the cross-sectional variation (such as when a state deregulates) gets removed; coefficients are driven by *changes* in variables after a state alters its regulations. Persistent differences across states (e.g., those dominated by large

23. Most states first permitted banks and bank holding companies to branch through mergers or acquisitions of existing banks or bank branches, and later allowed banks to open new branches throughout the state.

24. These issues are especially important for studies of entry regulations because the competitive shakeout that occurs after regulatory change increases the odds that some banks will not survive. Nevertheless, firm-level studies of banking efficiency generally suggest that during the 1990s, the consolidation in banking led to larger and more efficient organizations. For a review of this literature, see Berger, Demsetz, and Strahan (1999).

versus small banks) do not affect the results. Moreover, there is no evidence that changes in bank structure or economic conditions lead (or predict) deregulation, as might occur if states deregulated to try to jump-start a stalled economy by improving credit supply. Instead, all of the changes occur *after* reform.[25]

Panel A of table 8.3 documents how the structure of states' banking systems change following removal of restrictions on geographic expansion using the regression framework in equation (1). The regressions use data for forty-eight states plus the District of Columbia between 1976 and 1994, the period of rapid state-level regulatory change.[26] In column (1), the dependent variable equals the degree to which banking within a state is integrated with bank operations in other states. The extent of *integration* is defined as the share of the state's banks that are owned by a banking organization that also owns banking assets in other states. The results suggest that, on average, 17 percent of a state's banking assets become integrated with banks in other states after interstate banking deregulation. This increase is both statistically and economically large, equal to about 50 percent of the overall mean level of integration in the sample. Hence, state banking systems become better diversified following interstate deregulation as ownership ties between banks operating in many states become established.

While integration, and therefore bank diversification, increases, the second column of table 8.3 shows that local market concentration does *not* increase following deregulation; if anything, there is a slight drop following interstate banking reform, consistent with the trend toward lower local-market concentration (figure 8.8). The third column of table 8.3 shows that the market share of small banks declines, particularly after within-state branching reform. The share of assets held by banks with under $100 million (1994 dollars) in assets falls by 3.1 percentage points after branching is permitted and about 1.2 percentage points after interstate banking reform. Together, these two state-level regulatory changes account for about half of the trend decline in small-bank share between 1976 and 1994. So, the trends in bank structure can be accounted for in large part from removal of regulatory constraints on bank expansion.

Bank Risk

As noted earlier, geographic deregulation in the 1980s led to larger and better diversified banks. Theoretically, it is ambiguous whether the increase in competition that led to the diversification benefits of branch banking would be offset by costs of greater risk taking as monopoly rents in banking are competed away. Keeley (1990) and Hellman, Murdock, and Stiglitz

25. For detailed evidence on the timing of the effects of regulatory changes, see Jayaratne and Strahan (1996); Kroszner and Strahan (1999); and Morgan, Rime, and Strahan (2004).

26. We drop the states of South Dakota and Delaware because the entry of credit card banks into these two states makes their historical evolution during the 1980s unique.

Table 8.3 **Panel regression of bank structural and economic performance on deregulation indicators**

	Panel A: Banking market structure			Panel B: State economic performance		
	Share of assets held by out-of-state BHCs	Local-market deposit HHI	Share of assets held by banks with under $100 million in assets (1994 dollars)	Employment growth	Growth in new incorporations	Absolute value of unexpected employment growth
Postbranching	–0.007	–18.9	–0.031***	0.0083***	0.032**	0.0005
	(0.035)	(61.3)	(0.011)	(0.0028)	(0.012)	(0.0028)
Postinterstate banking	0.171***	–78.8	–0.012	0.0047*	–0.011	–0.0077**
	(0.035)	(55.9)	(0.007)	(0.0028)	(0.016	(0.0030)
Dependent variable statistics						
Mean	0.34	1,909	0.196	0.021	0.039	0.010
(Standard deviation)	(0.28)	(665)	(0.170)	(0.022)	(0.119)	(0.009)
N	931	905	931	931	931	931
R^2	0.13	0.86	0.95	0.55	0.23	0.26

Notes: Standard errors in parentheses. All models include both year and state fixed effects. The local deposit HHI is the sum of squared market shares for all banking organizations operating within a local market, defined as an MSA. For states with multiple MSAs, we average the HHI across MSAs within the state, weighted by the amount of deposits in the MSA. The model is estimated using a fixed-effects model with both year and state effects. These regressions are estimated using a fixed-effects model with both year and state effects. Sample includes forty-nine states (DC included, South Dakota and Delaware dropped) and nineteen years (1976–1994). Standard errors are constructed assuming that residual is clustered across states.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

(2000) emphasize that risk-taking incentives from deposit insurance are mitigated by access to monopoly rents fostered by regulatory barriers to aggressive competition. Thus, bank stability during the period between 1940 and 1970 may be explained by the absence of competition in the face of pricing restrictions and restrictions on branching and interstate banking. Keeley (1990) and Demsetz, Saidenberg, and Strahan (1996) show that high stock market valuation of banks relative to book values ("franchise value") is associated with banks holding lower risk loans and more capital.

Removal of restrictions on bank underwriting activities also has the potential to enhance bank diversification.[27] Whether such diversification leads to less risk depends on how bank operating and financial policies adapt to the deregulation. Demsetz and Strahan (1997) find, for example, that large banks, while better diversified, are no less risky than small banks because they tend to hold riskier loans and less capital. Given this fact, it is perhaps not surprising that the evidence on the effects of cross-sector expansion of banks into securities and underwriting is mixed. Certainly, this issue has become an important point of controversy following the 2007 to 2008 financial crisis, as we describe in the epilogue.

Deposit insurance also of course played a role in shaping the risk of banking. Deposit insurance creates incentive for banks to maximize asset risk and minimize capital because bank shareholders capture all upside gains but do not face the full costs of bank risks (Peltzman 1970; Merton 1978). As noted, the US banking system was stable throughout the first thirty-five years after federal deposit insurance, and much of that stability occurred because banks enjoyed limited competition. With limits on both price competition and entry, banks had access to high profits and thus low failure rates. Moreover, the incentive to take advantage of deposit insurance by increasing asset risk and reducing capital were offset by monopoly rents. During the 1980s, however, increased competition both within the financial industry and from the development of securities markets reduced profitability in banking and came with dramatically increased failures.

The experiences of the savings and loan (S&L) industry in particular indicate that badly structured deposit insurance can encourage excessive risk taking. Kroszner and Strahan (1996) show, for example, that S&Ls

27. Kwast (1989) examines banks' balance sheets and compares returns on trading account and nontrading account assets. He finds only limited potential diversification benefits from securities underwriting by banks. Boyd and Graham (1988) and Boyd, Graham, and Hewitt (1993) use a combination of merger simulations and portfolio weighting to find that bank involvement in life and property/casualty insurance could, ceteris paribus, reduce the risk of bank failure. Involvement in securities or real estate, however, would likely increase the risk of failure. Lown et al. (2000) simulate mergers between financial companies over a more recent time period and find a potential reduction in the risk of failure as a result of hypothetical mergers between life insurance firms and BHCs. Kwan (1998) finds that BHC securities activity is associated with greater risk, but provides potential diversification benefits due to the low correlation between returns on banking and securities activities. For a review, see Kwan and Laderman (1999).

that converted from mutual to stock ownership grew faster, expanded their holdings of risky assets (e.g., junk bonds), and disgorged cash in the form of dividend payments. In fact, there were even instances of insolvent S&Ls paying dividends. Thus, those firms that explicitly altered their ownership form to be able to profit from deposit insurance tended to increase risk most dramatically to exploit the government subsidy. More broadly, Kane (1989) emphasizes the failure of regulators to close institutions despite the costs to the deposit insurance regime, thus increasing the problem of excessive risk taking.

On balance, US banking was stable from the initiation of deposit insurance in the 1930s until the early 1980s. This stability occurred despite the latent incentive toward high-risk strategies embedded in government-subsidized deposit insurance, in part because regulatory barriers to competition fostered high rents in the industry. This protection allowed inefficient institutions to dominate, thus harming bank customers facing higher cost and lower quality than they would under a more competitive regime. The landscape began to change in the 1970s and 1980s as small and inefficient banks lost capital in the face of macro instability and high interest rates. With less wealth on the line, these generally small banks lost both the ability and incentive to battle larger banks in the political arena. At the same time, large banks, which historically favored unrestricted expansion, began to use new technologies such as ATMs to compete in new markets (even without explicit deregulation). These changes tipped the political balance toward advocates of regulatory openness (see Kroszner and Strahan 1999 and 2001b, and section 8.4). With deposit insurance still firmly in place but access to rents rapidly diminishing (for both technological and regulatory reasons), many banks and thrifts "gambled for resurrection" by raising insured deposits and investing the proceeds in high-return but high-risk strategies. The result was the high rate of failures at both banks and savings institutions during the 1980s.

More recently, the 2007 to 2008 financial crisis raises the issue of bank risk more broadly. As we touch on in the epilogue (and describe in more detail in Kroszner and Strahan 2011), the increasing development, depth, and efficiency (see below) can enhance growth but can also increase the volatility of the financial sector and growth. Market adaptation also contributed to the development of a web of interconnections through over-the-counter derivative markets that increased the fragilities of both individual banks and the system as a whole.

Efficiency and Pricing

Do regulatory changes lead to meaningful improvements in the efficiency of banks, reductions in costs, and reductions in the price of bank services? As noted earlier, interest rate regulation—maximum lending and deposit rates—had effects on prices during periods when market interest rates made

these constraints binding. For deposit markets, the effects were relatively homogeneous because there are limited differences in risk due to government guarantees. Banks facing binding Regulation Q interest rate ceilings did face disintermediation, which became acute in the 1970s both because market rates soared and because nonbank financial firms began to offer close substitutes for checkable deposits. Banks attempted to compete for funds by providing higher quality service (more branches), and by offering gifts and other inducements for deposit, thereby dissipating much of the potential rents generated by the absence of price competition. Usury limits on loan interest rates also restricted credit supply overall, but probably restricted credit most among high-risk borrowers. As noted before, the *Marquette* decision, which effectively undermined states' ability to limit credit card interest rates, was followed by a steady increase in bankruptcy as higher risk households gained access to unsecured credit.

Removal of restrictions on geographic expansion also came with better efficiency and pricing. Jayaratne and Strahan (1998) and Black and Strahan (2001) report that noninterest costs, wages, and loan losses all fell following branching reform. These cost reductions led, in turn, to lower prices on loans (although not on deposits). The mechanism for this better performance seems to be changes in the market shares of banks following deregulation (Stiroh and Strahan 2003). Prior to regulatory reform, well-run banks faced binding constraints on the markets in which they could operate. When these constraints were lifted, however, assets were reallocated toward the better-run banks as they gained the opportunity to acquire market share.[28]

Figure 8.9 shows the consequences of these healthy competitive dynamics by plotting the market share of banks with above-median profits for states that have permitted branching since the 1930s or before (twelve states) compared with the unit banking states that did not permit any form of branching (sixteen states). The figure illustrates the detrimental effects of these constraining regulations. For example, in 1980, before deregulation, the higher-profit banks held slightly under 50 percent of the banking assets in the average unit-banking state; in contrast, the higher-profit banks held about 70 percent of assets in states where banks were never constrained by branching restrictions. This difference disappears completely by 1994. By then the unit banking states had permitted within-state branching, thus allowing the better-run banks to dominate the industry.[29]

28. Hubbard and Palia (1995) also show that management compensation became more sensitive to performance after deregulation.

29. Sorting banks in a given regulatory regime by profits is designed to separate well-run from poorly run banks. To the extent that regulations generate rents, all banks in a given regime may tend to have high profits. What matters for this comparison is the relative ranking across banks. A similar result can be seen by sorting banks on cost-based measures of performance. Studies that examine efficiency gains for within-sector consolidation include Berger (1998), Hughes et al. (1999); Goldberg et al. (1991).

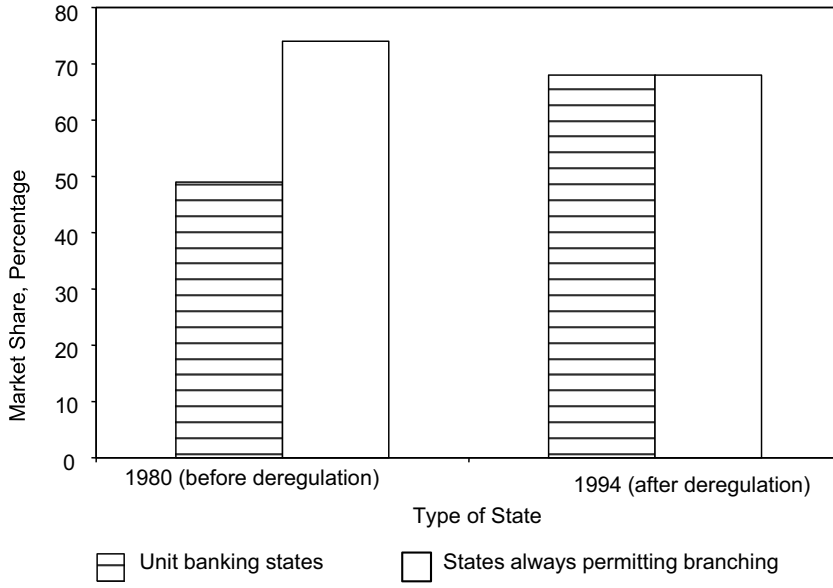

Fig. 8.9 Market share of high-profit banks
Source: Stiroh and Strahan (2003).

Expansion of Activities and Potential for Conflicts of Interest

A separate category of research examines the production advantages of financial conglomeration across business lines. Once again, there are many studies of efficiency and profitability *within* banking, securities, and insurance, but research on advantages of *cross-sector* consolidation is limited. Existing research concentrates on bank underwriting of corporate debt and equity securities, and emphasizes information scope economies in the joint production of commercial lending and underwriting. Through their lending activities, banks may gain more knowledge about a firm's prospects than other market participants. This informational advantage can be a double-edged sword. On the positive side, banks may be able to identify firms with good opportunities earlier and at lower cost than other financial institutions. On the negative side, a commercial bank might use its superior information to its own advantage, for example, not revealing potential problems and issuing securities to the public that are riskier than the market believes (see Kroszner 1997 for a summary).

The empirical research suggests that banks are not succumbing to conflicts of interest and abusing their information to mislead the market. Indeed, research on commercial bank underwriting prior to Glass-Steagall (Kroszner and Rajan 1994, 1997; Ang and Richardson 1994; Puri 1996) suggests that debt securities underwritten by banks had a *better* default record than

those underwritten by investment banks. Kroszner and Rajan (1997) show that throughout the 1920s, commercial banks increasingly underwrote their securities through separately incorporated and capitalized affiliates rather than through internal departments of the commercial bank itself. Otherwise similar securities received higher prices (lower risk premia) when underwritten by a commercial bank affiliate than those underwritten directly by the bank, suggesting that the "firewall" structure enhanced the credibility of the underwriting bank. In particular, the greater the proportion of independent directors on the affiliate's board, the greater was the reduction in the risk premium on the securities underwritten by the affiliate. Thus, the increasing use of the affiliates could at least in part be explained by commercial banks adapting their organizational structure to address public concerns about the potential for conflicts of interest.

After the repeal of Glass-Steagall with the Financial Modernization Act of 1999, underwriter fees are lower for bank-underwritten debt securities relative to similar securities issued by stand-alone investment banks (Sufi 2005). Drucker and Puri (2005) find that evidence that banks bundling lending and equity underwriting services reduce costs to customers. Schenone (2004) finds lower underpricing during initial public offerings at firms that have established a lending relationship with a commercial bank capable of underwriting the IPO, consistent with the idea that informed banks can certify the value of securities. Gande et al. (1997) argue that banks' unique information advantage with respect to firms with lower credit ratings results in relatively higher prices (lower yields) on underwritten debt securities for these types of firms. Yasuda (2005) reaches the same conclusion; she finds that client-specific relationship capital is a unique bank advantage in underwriting when banks have strong prior lending relationships with the issuing company.

Another potential source of conflicts occurs when commercial bankers serve as board members of client firms, or when executives of client firms serve on the boards of their banks. Kroszner and Strahan (2001a, 2001c) investigate the frequency of connections between banks and nonfinancial firms through board linkages, and examine whether those connections affect lending. We document that banks are heavily involved in the corporate governance network through frequent board linkages. Banks tend to have larger boards with a higher proportion of outside directors than nonfinancial firms, and bank officer-directors tend to have more external board directorships than executives of nonfinancial firms. We then show that low-information cost firms—large firms with a high proportion of tangible assets and relatively stable stock returns—are most likely to have board connections to banks. These same low-information cost firms are also more likely to borrow from their connected bank, and when they do so the terms of the loan appear similar to loans to unconnected firms. In contrast to this last finding, Guner, Malmendier, and Tate (2008) do find evidence that firms

with financial experts on board appear to have better access to financial resources, although this increase is concentrated among large and relatively unconstrained firms.

Given the lack of data, it is not surprising that there is little research on either bank production advantages in insurance or on the joint production of insurance and securities services in the United States. Lown et al. (2000) argue that Europe provides a convenient model for how the US financial system could be affected by GLBA because most European countries permit financial conglomerates. They show that banks have become increasingly involved in insurance activities and argue that economies of scope in market and distributing both banking and insurance products through the branch network can explain their success. In fact, about 10 percent of all financial M&A activity in Europe occurred between banks and life insurance companies over the past fifteen years.

In the financial crisis of 2007 to 2008, questions have been raised about whether market forces were able to deal with the potential for conflicts of interest related to mortgages and mortgage-backed securities. For example, Keys et al. (2010) provide evidence that credit evaluation for mortgages expected to be securitized was less careful than for those expected to be held by originating lenders and that such loans defaulted more frequently. As we discuss further in the epilogue, conflicts related to securitization can help explain the expansion of credit that fueled the housing boom in the 2000s (Mian and Sufi 2009).

Growth and Entrepreneurship

Did the beneficial changes in banking have quantitatively important effects on the real economy? Schumpeter (1969) argued in the early part of the twentieth century that efficient financial systems promote innovations; hence, better finance leads to faster growth. Robinson (1952) countered that the causality was reversed; economies with good growth prospects develop institutions to provide the funds necessary to support those good prospects. In other words, the economy leads and finance follows. Recent theoretical developments have fleshed out two potential causal links from financial systems to growth, even in the long run. Financial markets can matter either by affecting the volume of savings available to finance investment or by increasing the productivity (or quality) of that investment. These theories show that an improvement in financial market efficiency can act as a lubricant to the engine of economic growth, allowing that engine to run faster.

Empirical research has increasingly provided support for the Schumpterian view that financial market development can play an important causal role in driving long-run growth. For example, King and Levine (1993) demonstrated that the size and depth of an economy's financial system is positively correlated with its future growth in per capita real income.

While this evidence is appealing, it cannot rule out the possibility that

financial development and growth are simultaneously driven by a common factor not controlled in the empirical analysis. Rajan and Zingales (1998) and Cetorelli and Gambera (2001) attempt to answer this criticism by exploiting cross-industry differences in financial dependence. They show that in countries with well-developed financial markets, industries that require more external finance grow faster than "cash cow" industries that can finance investment with internally generated funds.[30] Kroszner, Laeven, and Klingebiel (2007) examine the impact of bank crises on cross-industry differences in financial dependence. Consistent with an important "credit channel" role of banking, they find that bank crises have a disproportionately negative impact on financially dependent firms in countries with well-developed financial systems: in such systems, the financially dependent firms grow faster in normal times but are hit harder in crisis times. Levine, Loayza, and Beck (2000) attempt to establish a causal link from finance to growth by using preexisting legal differences across countries as instruments for the development of the banking system; they show that the exogenous component of banking development is positively related to growth performance.[31]

Another way to establish that better finance (or, specifically, better banking) can lead to faster growth is to find policy changes that lead to more efficient finance (banking) and see how the economy responds.[32] Bekaert, Harvey, and Lundblad (2003) do this for equity market liberalization across countries and find that economic growth sped up after reform. Jayaratne and Strahan (1996) study state-level branching deregulation and find that this improvement in banking market openness spurred faster economic growth.[33] Using data from 1972 to 1992, they estimate the change in economic performance before and after deregulation and found that annual growth rates accelerated by 1/2 to 1 percentage point. In that study, they worked hard to rule out other interpretations of the finding. For example, they showed that states did *not* deregulate their economies in *anticipation* of future good growth prospects. They also found no other concomitant policy changes that could account for the result and no consistent political changes, such as a change in the party controlling the state government, around the time of deregulation.

In panel B of table 8.3, we reestimate a growth model similar to the one

30. Cetorelli (2001, 2003) attempts to gain a better understanding of the channels through which better finance can affect economic performance. He shows that countries with concentrated banking sectors tend to have more concentrated industrial sectors, particularly in those sectors where external finance is important. On the other hand, Bonacorrsi di Patti and Dell'Ariccia (2004) find that banking concentration in Italy helps foster creation of new firms.

31. Bertrand, Schoar, and Thesmar (2007) find important improvements in allocative efficiency across firms in France following deregulation of French banking that began in the mid-1980s.

32. For a comprehensive review, see Levine (2005).

33. More recently, Collender and Shaffer (2003) explore how other aspects of banking structure affect economic growth.

in Jayaratne and Strahan using a slightly different sample period (1976 to 1994). The table reports the results of the growth regressions based on overall state-level employment. The result (column 4) suggests that average per capita income growth accelerated following both branching and interstate banking reform.[34]

If more competitive banking really spurs growth, we would expect particularly large benefits among relatively bank dependent sectors of the economy, such as small firms or entrepreneurs. To test this idea, panel B of table 8.3 reports how growth in new business incorporations—a measure of firm entry and thus entrepreneurial activity—changes following banking reform (column 5).[35] We find that the growth of entrepreneurial activity increased significantly following banking deregulation. Annual growth of new incorporations per capita increased by 3.2 percentage points after branching deregulation, while the coefficient on interstate banking deregulation is not statistically significant. Thus, the effects of geographic banking reform on entrepreneurial activity are substantially larger than their effects on overall growth of employment. This makes sense because bank credit is most important in financing small businesses without access to public securities markets, and suggest that the reason why growth accelerates after geographic deregulation is that credit supply to the entrepreneurial sector expands.[36]

Stability and Business Cycles

The evidence so far points to substantial benefits of opening up banking markets to potential entry and greater competition through deregulation. Entrepreneurs are able to start businesses and, perhaps through their efforts, economic growth accelerates. Cross-country evidence is beginning to emerge, suggesting that opening up financial markets to foreign entry can also create benefits associated with macroeconomic stability (Barth, Caprio, and Levine 2004). As noted earlier, however, there is also evidence from studies at the bank level that risk taking may increase with the reductions in franchise value that come following banking deregulation.

Morgan, Rime, and Strahan (2004) test how state-level volatility changed as the US banking system integrated across state lines following interstate

34. Jayaratne and Strahan (1996) also show that gross state product grows faster after branching reform. Moreover, they are careful to rule out the possibility that the growth increases were driven by just a few states; that growth accelerated because reform occurred during business cycle troughs or around banking crises (note that this is not the case following interstate banking reform, making it harder to draw causal inferences from this result); and that growth accelerated because other policies changed at the same time as banking reform.

35. We use new business incorporations as a measure of entrepreneurial activity in each state, again from 1976 to 1996, because it offers the best proxy available that is compiled on a consistent basis over a relatively long period. Black and Strahan (2002) provide evidence that this measure is a reliable indicator of business formations.

36. Consistent with a greater rate of creation of new firms, Cetorelli and Strahan (2006) also find that the number and share of small firms increases with measures of banking market competition, especially in sectors dependent on external finance.

banking reform. The expected effect of banking integration on business cycles, however, is theoretically ambiguous. Shocks to the value of local collateral can actually become more destabilizing after integration because, for example, multistate banks can move capital elsewhere. In contrast, local shocks to the banking system itself become much less destabilizing when banks operate across many markets. Overall, Morgan et al. find that economic volatility declines with interstate banking deregulation but not with in-state branching reform.[37]

The last column of table 8.3 reports the bottom-line finding in Morgan et al. In this regression, the dependent variable equals the absolute value of the employment growth residual from the model reported in column (4). The dependent variable thus measures the magnitude of each state's business cycle shock. These shocks become smaller on average after interstate banking reform and the associated integration of the banking system.[38] The coefficient suggests that the average shock size falls by 0.8 percentage points, relative to an unconditional mean shock size of 1.0 percentage points. In other words, prior to deregulation and banking integration, the typical state's deviation from expected growth is about 1.4 percentage points, while after deregulation the typical deviation falls to about 0.6 percentage points.

The theoretical analysis in Morgan et al. suggests better macroeconomic stability following deregulation because state economies become insulated from shocks to their own banks. In a disintegrated banking system, such as the one we had in the 1970s and early 1980s, shocks to bank capital lead to reductions in lending, thereby worsening downturns. In contrast, with integration a state can import bank capital from abroad (i.e., from other states) when its banks are down, thus continuing to fund positive NPV (net present value) projects. If this explanation really holds, then the correlation between local measures of economic performance or loan availability with the financial capital of local banks ought to weaken with deregulation and integration.

We put this notion to the test by regressing state-level loan growth and employment growth on the growth rate of total bank capital in the state, along with interactions between bank capital growth and the deregulation indicator variables. The structure of the model follows:

$$
\begin{aligned}
(2)\ Growth_{st} = {} & \alpha_t + \beta_s + \gamma^1 Within\text{-}state\ Branch\ Deregulation_{st} \\
& + \gamma^2 Interstate\ Banking\ Deregulation_{st} + \gamma^3 CapitalGrowth_{st} \\
& + \gamma^4 (Within\text{-}state\ Branching\ Deregulation_{st} * CapitalGrowth_{st}) \\
& + \gamma^5 (Interstate\ Banking\ Deregulation_{st} * CapitalGrowth_{st}) \\
& + \varepsilon_{st}.
\end{aligned}
$$

37. In addition, Gatev and Strahan (2006) and Gatev, Schuermann, and Strahan (2006) show how banks help provide liquidity during periods of market pullbacks such as the one following the Russian default during the fall of 1998, thereby helping stabilize the financial system.

38. Morgan et al. measure banking integration in more detail—for example, by taking account of transition following interstate reform—and find larger and more robust declines in volatility than those reported here.

Table 8.4 **Panel regression of state-level real loan growth on banking deregulation indicators and bank capital**

	Loan growth		
	Total loans	Commercial and industrial loans	Employment growth
Postbranching	0.029**	0.039***	0.007**
	(0.011)	(0.014)	(0.003)
Postinterstate banking	0.021	0.028*	0.004*
	(0.013)	(0.016)	(0.002)
Growth in bank capital	0.833***	0.580***	0.154***
	(0.089)	(0.160)	(0.037)
Growth in bank capital *	–0.043	0.061	–0.055
Postbranching	(0.113)	(0.181)	(0.036)
Growth in bank capital *	–0.332***	–0.300**	–0.061
Postinterstate banking	(0.094)	(0.130)	(0.040)
P-value for *F*-Test:			
Interactions jointly equal zero	0.001	0.08	0.02
Dependent variable statistics			
Mean	0.024	0.008	0.021
(Standard deviation)	(0.092)	(0.109)	(0.022)
N	882	882	882
R^2	0.56	0.62	0.60

Notes: Standard errors in parentheses. These regressions are estimated using a fixed-effects model with both year and state effects. Sample includes forty-nine states (DC included, South Dakota and Delaware dropped) and nineteen years (1977–1994). Standard errors are constructed assuming that residual is clustered across states.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

If interstate banking insulates the economy from local shocks to bank capital, we would expect $\gamma^5 < 0$. We also include an interaction between state-level capital growth and branching reform, although branching only permits integration within states, so there is less reason to expect this interaction effect (γ^4) to be economically and statistically significant.[39]

The results reported in table 8.4 suggest that interstate banking deregulation reduces the link between local lending and local bank performance.[40] According to the estimated coefficients, prior to banking deregulation there is nearly a one-to-one correspondence between state-level loan growth and capital growth (i.e., the coefficient on capital growth equals 0.83). By contrast, this link falls by about 40 percent after interstate deregulation.

39. In contrast, branching may weaken the link between local banking resources and lending at the city or county level. This channel merits further research.

40. Local banks here means banks headquartered within the state.

Similarly, the correlation between local employment growth and local bank capital growth weakens, although less dramatically than the effects on loan growth. Integration thus has salutary effects on business cycles by insulating the local economy from the ups and downs of its local banking system (and vice versa).

In contrast to the earlier period of geographical deregulation, financial integration during the 2000s, fostered by the growth of securitization, may have worsened the boom/bust cycle by facilitating huge capital flows into local markets (Loutskina and Strahan 2012). Theoretically, greater financial depth and development could either increase or decrease stability (see Kroszner and Strahan 2011). On the one hand, a larger and more developed financial sector could improve risk sharing and diversification and thereby reduce volatility. On the other, a larger and more developed financial sector could allow greater concentrations of risk and generate interconnections, thereby potentially making the entire system more fragile and vulnerable to shocks. In the epilogue, we touch on how postcrisis regulatory reform attempts to deal with these opposing forces in the financial system.

8.4 Deregulation: Why So Long in Coming?

As we have explained, the early part of the twentieth century was characterized by financial deepening, particularly in the 1920s. This process came to a halt with the Depression and much regulation of banking and securities markets passed during the first half of the 1930s. Markets adapted to regulatory constraints, but the beneficial changes following deregulation suggest that restrictions on competition in particular reduced the quality and availability of financial resources and hampered economic performance. Given the costs of these regulations, why was deregulation so long in coming?

8.4.2 The Politics of Deregulation

As we described in section 8.2, understanding interest group competition can be helpful in understanding the development of some Depression-era regulations, and it can be helpful in understanding more recent deregulation. In two earlier papers, we offer systematic evidence consistent with the importance of interest group politics in shaping regulatory change (Kroszner and Strahan 1999, 2001b). We use information in the timing of state deregulation of branching as well as congressional voting patterns on several legislative amendments to allow nationwide branching and to limit deposit insurance coverage. The first study shows that measures of interest group, public interest, and political-institutional factors can explain the timing of state-level branching deregulation during the last thirty years (Kroszner and Strahan 1999).

In particular, we employ a hazard model technique to estimate how cross-state differences in these factors influence the timing of deregulation rela-

tive to the average.[41] Private interest factors receive both economically and statistically significant support in the data. As the share of small banks in the state increases, for example, branching deregulation is delayed. In particular, 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. (The average time until branching deregulation from 1970 is sixteen years.) This result is consistent with an intraindustry rivalry hypothesis of small banks preferring branching restrictions and large banks preferring deregulation.

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. 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. This result is difficult to explain on purely public interest grounds.

Deregulation also occurs earlier in states where small, bank-dependent firms are relatively numerous. A one standard 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 users of banking services is consistent with both the private and public interest theories.

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.

Private interests thus appear to play an important role in the deregulatory process. Although 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.

To check the plausibility of the results, we also consider whether the ex post consequences of deregulation are consistent with the ex ante positions attributed to each interest group (see Kroszner and Strahan 1999 for details). 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 because the average interest rates on loans tends to fall following branching deregulation. These findings support the private interest interpretation of the results

41. We estimate a Weibull hazard function with time-varying covariates. The same results are obtained in simple ordinary least squares regressions. We also control for a variety of other factors that might affect the likelihood of deregulation, such as the frequency and size of bank failures in the state and regional clustering of deregulation.

described earlier: groups that will benefit push to speed deregulation and those that will be harmed push to delay it.

Do the forces driving intrastate branching deregulation also drive interstate deregulation at the federal level? Financial services interests are active contributors and lobbyists. 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, 2000, and 2005).

After virtually all states adopted intra- and interstate branching deregulation, the 1994 Riegle-Neal Act repealed the 1927 McFadden Act to phase out 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 it is not possible to estimate a voting model for 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 of Representatives on November 14, 1991 on an amendment sponsored by Wylie (R-OH) and Neal (D-NC) to introduce interstate banking and branching deregulation to a financial services reform package.[42] Although the amendment passed by 210 to 208, the bill to which it was attached subsequently was defeated.

To check for the impact of the factors that were found to be influential in the state-level reforms, we also consider 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).

Consistent with the state-level deregulation process, the second study uses a probit model to analyze voting patterns and shows that legislators are more likely to support the amendment if their states have a relatively low share of small banks (see Kroszner and Strahan 1999). As in the analysis of the timing of intrastate deregulation, the fraction of small banks is the most important interest group influence on a legislator's voting decision. 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 in favor of interstate branching. Overall, the analysis of the vote on federal

42. The Wylie-Neal amendment also included provisions limiting certain insurance and real estate powers of national banks (*Congressional Record*, November 14, 1991, pp. 10239–42).

branching deregulation provides a consistency check that the importance of interests operating on the state legislatures are very similar to those operating at the federal level.

8.4.3 Why Did Deregulation Take So Long?

An important question remains in order to understand the broad timing of deregulation: Why begin in the 1980s rather than the 1950s or some earlier period? The market for financial regulation, like all regulation, involves competition among groups with competing interests with significant campaign contributions at both the state and national levels (see Makinson 1992; Kroszner and Stratmann 1998, 2000, and 2005; and Kroszner 2000). Financial services interests, for example, rarely comprise a unified block, with much of their lobbying effort involving competition among themselves. The beneficiaries were able to support an equilibrium coalition in favor of geographical restrictions from the 1930s through the early 1980s despite their costs to (unorganized) consumers of financial services long after the value of them to governments as a key source of revenue had faded.

While political economists have often had success in identifying the group that receives concentrated benefits of a particular regulation in order to explain the persistence of that regulation, deregulation has been more difficult to explain. Many factors affect the highly complex process of regulatory change. Nonetheless, to understand the broad timing of deregulation, it can be helpful to try to identify technological, legal, and economic shocks that would alter the old equilibrium. We now consider some of these shocks in detail to see whether they can help explain why regulatory change occurred when it did.

Beginning in the 1970s, three major innovations reduced the value to the protected banks of local geographic monopolies by increasing the elasticity of depositors' funds. First, the invention of the automatic teller machine (ATM) helped to erode the geographic ties between customers and banks. After some legal challenges, ATM networks were determined not to constitute branches, thereby permitting ATM networks to spread throughout the United States and the world. Table 8.5 shows the rapid proliferations of ATMs, which did not exist before 1970. Second, consumer-oriented money market mutual funds also originated in the 1970s. Checkable money market mutual funds and the Merrill Lynch Cash Management Account demonstrated that banking by mail and telephone provided a convenient alternative to local banks.[43] From zero in 1970, table 8.5 shows that money market mutual funds are roughly one-third the size of deposits held at banks. Third, technological innovation and deregulation have reduced transportation and

43. 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.

Table 8.5 Broad trends in commercial banking, 1950–2000

Year	Number of ATMs	Domestic bank deposits (billions)	Money market mutual fund (billions)	Percentage of deposits + money funds held by banks	Small banks' percentage of banking assets
1950	0	$154	$0	100	n/a
1955	0	191	0	100	n/a
1960	0	228	0	100	24
1965	0	330	0	100	20
1970	0	479	0	100	18
1975	9,750	775	4	99	18
1980	18,500	1,182	76	94	17
1985	61,117	1,787	242	88	14
1990	80,156	2,339	493	83	11
1995	122,706	2,552	530	82	8
2000	273,000	3,146	1,134	74	4

Notes: For 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. The number of ATMs in 1978, the first year for which complete data are available, is 9,750. For 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. For column (5), percentage 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.

communication costs, particularly since the 1970s. Customers thus now have lower costs of using banks located farther away from them than in the past (Petersen and Rajan 2002).

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

On the lending side, increasing sophistication of credit-scoring techniques, following innovations in information processing technology, financial theory, and the development of large credit databases, have begun to change the relationship character of bank lending toward less personal and more standardized evaluation. As a result of these innovations, a national market developed for residential mortgages in the late 1970s. In the 1980s,

consumer lending relied increasingly on automated information processing, leading to the development of credit card securitization. In recent years even banks' lending to small businesses has become increasingly automated, relying on standardized credit scoring programs rather than the judgment of loan officers.

Technological change thus has diminished the value of specialized local knowledge that long-established local bankers might have about the risks of borrowers in the community. Such changes have increased the feasibility and potential profitability for large banks to enter what had traditionally been the core of small bank activities. The large banks have therefore had an incentive to increase their lobbying pressure to attain the freedom to expand into these markets. In addition, as the value of a local banking relationship declined, small firms (borrowers) also would be more likely to favor the entry of large banks into local markets. These factors combined to start undermining the economic performance of the small banks that had benefitted most from the geographic restrictions. Table 8.5 shows the relative decline in small banks' market share even prior to the branching deregulation that began in the early 1970s.

One can also point to "exogenous" forces outside the development of new technologies in the financial sector. For example, Kane (1996) argues that a 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 the failure rate of banks begins to rise (recall figure 8.2). In the 1980s, the savings and loan crisis and taxpayer bailout 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. For example, West Virginia's state legislature passed a bill lifting most branching restrictions to help an ailing economy. The legislature's actions were "inspired by the state's need for industrial expansion and a greater job base. West Virginia leads the nation in unemployment" (*American Banker*, 04/17/84).

Consistent with Kane's argument, economic conditions also played a part in relaxing restrictions on interstate banking. The Garn St Germain Act of 1982 amended the Bank Holding Company Act by permitting the acquisition of *failed* thrifts and banks by out-of-state banks or holding companies. Banks and thrifts failed by the hundreds in some states in the early 1980s after the recessions of 1980 and 1981 to 1982 and the "third-world debt" crises. Surviving institutions in hard-hit states were often not fit to recapitalize the failed ones, so Congress acted to let in healthy banks from out of state.[44] Some states then allowed out-of-state banks to buy their banks,

44. While some states did relax restrictions on bank expansion in response to macroeconomic downturns, there is no correlation between rates of bank failures or the state-level business

but typically these moves were done on a reciprocal basis. For example, when Maine first allowed entry by out-of-state BHCs, the law stipulated that banks from Maine must be allowed to enter those states. Over time, state reciprocal agreements to allow interstate banking grew, and the transition to full interstate banking was completed with passage of the Reigle-Neal Interstate Banking and Branching Efficiency Act of 1994. Reigle-Neal made interstate banking a bank right, rather than a state right; banks or holding companies could now enter another state without permission. This act also permits banks to operate branches across state lines for the first time, allowing multibank holding companies to consolidate their operations.

Certainly, the major economic and financial shocks surrounding the 2007 to 2008 financial crisis led to important political economy changes, resulting in the most sweeping financial regulatory reforms since the 1930s, and we now turn to that in the epilogue.

8.5 Epilogue: Lessons from the 2008 Crisis

We have described the causes and consequences of banking deregulation prior to the financial crisis of 2008–2009. The reforms removed many of the constraints binding since the 1930s or before, thus reshaping the financial industry and, in turn, the economy. Reform came with many benefits, but many of the preconditions for the 2008 financial crisis came, at least in part, from efforts to avoid or reduce the costs of regulation; that is, what we call market adaptation. In this epilogue, we discuss some of the causes of the financial crisis and consider whether recent reforms may prevent the next one.

During the years leading up to the financial crisis, the long-term trends that we document transforming both the liability and asset sides of bank balance sheets accelerated, creating greater interlinkages among institutions, increasing the relative importance of securities markets, facilitating financial integration, and speeding up capital mobility. On the liability side, banks and other financial institutions rely more on market-based sources of short-term funding, such as commercial paper, asset-backed commercial paper (ABCP), and repurchase agreements. As we have seen, money market mutual funds have grown to nearly the size of bank deposits and have become key sources of funding. On the asset side, intermediaries securitize many of the assets they originate (e.g., loans and mortgages). This "originate to distribute" model of intermediation thus relies on the operation of securitization markets, thereby connecting intermediaries to these markets.

As we have discussed, the evolution to a more complex and intercon-

cycle conditions and the timing of branching reform (see Jayaratne and Strahan 1996; Kroszner and Strahan 1999). Similarly, Morgan, Rime, and Strahan (2004) show that the timing of interstate banking deregulation *cannot* account for the decline in state-level economic volatility that follows reform.

nected system came about, in part, by market adaptation to, and sometimes avoidance of, regulations. Some changes occurred in response to financial institutions' attempts to lower the burden of regulations. Securitization, which fosters the benefits of both diversification and liquidity, expanded too far in part due to government subsidies and in part because it lowered the burden of required capital. During the 2000s, Fannie Mae and Freddie Mac subsidized securitization by offering low-priced credit enhancements to mortgage pools and by purchasing securitized subprime mortgages in the secondary market. Moreover, the Basel capital framework encouraged securitization of low-risk loans because it treated all loans to businesses equally for the purposes of required capital. Thus, it became attractive to securitize loans to highly rated creditors and hold on-balance sheet loans to lower-rated creditors.

As a consequence, in the 2000s, the ABCP market grew dramatically, with outstandings rising by more than $500 billion between 2004 and mid-2007. These instruments created off-balance sheet conduits with similar asset transformation characteristics of banks (long-term loan pools financed with short-term liabilities). Issuers could reap the same upside as if those assets had stayed on-balance sheet—because they were residual claimants in the conduits—but with no required regulatory capital (Acharya, Schnabl, and Suarez 2010). Thus, much of the explosive growth of this market may be due to regulatory arbitrage, one form of market adaptation. The dramatic expansion of mortgage credit fueled by securitization likely played a role in driving home prices to unsustainable levels. Moreover, the collapse of the ABCP market in August of 2007 marked the beginning of the financial crisis.

Transformations in the financial system away from traditional intermediaries and toward securities markets have also come with more opaque distribution of risks across the system. Derivatives have grown in parallel with the expansion of the securities markets, and these markets have faced little regulatory analysis of their potential systemic consequences. In the 1970s, options markets grew in response to better understanding of pricing and hedging of nonlinear instruments (Black and Scholes 1973). Interest rate swaps grew in popularity in the 1980s, and, in the 1990s, credit default swaps emerged and grew rapidly. Today's system involves long chains, with many links being market-based intermediaries that do not rely on deposits for funding (see Adrian and Shin 2009; Kroszner and Shiller 2011). The many links in the modern financial system allow shocks to propagate rapidly across the system. With the explosive growth of derivatives, the distribution of risks becomes harder to assess, particularly without a central clearinghouse to monitor and to aggregate information. Misjudgments about risks, rather than being self-correcting, can thus cascade through the system as major players reduce credit due to uncertainty about the distribution of risk exposures (Kroszner 2011). Contraction of wholesale, short-term credit

markets was a key mechanism that propagated and amplified fundamental shocks from housing during the financial crisis (Gorton and Metrick 2012).

Thus, the welfare calculation for assessing both past deregulation and potential future regulatory reform is complex. As we have seen, deregulation led to faster growth and lower volatility during the 1970s and 1980s. Moreover, international evidence suggests that financial liberalization has come with greater credit availability and faster growth, and much evidence suggests that this link is causal (e.g., Levine 2005; Kroszner, Laeven, and Klingebiel 2007). That evidence has generally been used to support reduced restrictions on the financial sector. Yet financial liberalization and integration, by allowing financial capital to flow away from low-growth areas and into booming ones, can also amplify local cycles. During the 2000s, for example, capital mobility fostered by securitization allowed funds collected from global capital markets to pay for housing booms in areas like Florida, Arizona, Nevada, and southern California. Had such areas been forced to rely on local pools of savings, the boom-bust cycle likely would have been smaller (Loutskina and Strahan 2012).

Regulatory reform thus faces a fundamental tension: How do we allow continued innovation that fosters financial deepening, cheaper credit, and faster growth, while mitigating the potential for instability inherent in the interconnections that come with financial development? In some cases, such as removal of geographical restrictions on bank expansion, financial sector reform has not involved a trade-off and has resulted in both higher growth and lower volatility. Obviously, this is not the case in all circumstances. In Kroszner and Strahan (2011), we offer two key principles to guide thinking about future reform. First, we discuss avoiding the next round of regulatory arbitrage in which financial activity moves "into the shadows," where risks may accumulate like dead wood ready to ignite the next wildfire. Second, we argue that reforms that improve market transparency can reduce the uncertainty of counterparty exposures and interlinkages between major players, thereby lowering contagion risk.

Looking ahead, regulatory change over the next decade will likely be shaped by the gradual implementation of the Dodd-Frank Wall Street Reform and Consumer Protection Act, passed into law on July 21, 2010, and new Basel III capital and liquidity regulations. As in previous episodes of financial downturns, such as those in the 1930s and 1980s, the passage of Dodd-Frank comes in response to perceived weaknesses and excesses in the system following the 2008 crisis. Dodd-Frank included the so-called Volcker rule, which requires commercial banks and bank holding companies to almost completely divest their activities in hedge funds, private equity, and proprietary trading. This is an echo of the Glass-Steagall separation of commercial from investment banking activities passed in the 1930s. In both cases, however, the evidence does not seem to be consistent with these activities at major banks being a key source of fragility in the crises. Difficulty defining

exactly what constitutes proprietary trading and concerns about regulatory avoidance also have slowed the implementation of the Volcker rule.

Dodd-Frank eliminated one regulatory agency, the Office of Thrift Supervision, which arose from a reorganization of the oversight of thrift institutions following the savings and loan crisis in the late 1980s. Other regulatory agencies, such as the Fed, FDIC, and OCC will now oversee thrifts. The legislation attempts to deal with concerns about predatory lending that emerged as credit flowed to new and unsophisticated borrowers in the 2000s by setting up a separate consumer protection bureau. The legislation, however, does not address Freddie Mac and Fannie Mae, the federal housing government-sponsored enterprises that fueled the rapid growth of mortgage securitization.

The new law creates the Financial Stability Oversight Counsel, a consortium of regulators chaired by the Treasury Department, that is to have new authority to search out and address sources of system-wide risks both within and beyond the banking sector, and encourages the migration of over-the-counter derivatives onto centrally cleared platforms.

Dodd-Frank also attempts to mitigate the "too big to fail" (TBTF) problem by creating new resolution authority. Under the law, the FDIC may close and liquidate distressed financial institutions in ways that avoid costs associated with bankruptcy. Dodd-Frank's new resolution approach allows the FDIC to impose losses on uninsured creditors, shareholders, and managers. In principle, such authority ought to help mitigate TBTF by increasing the ex ante belief that creditors would bear losses in default, but few specifics on the circumstances in which this authority would be exercised have been put out, raising questions about its effectiveness. The Dodd-Frank Act also requires large institutions to develop a resolution plan, which may help reduce uncertainty about failure resolution (Kashyap 2009; Kroszner and Shiller 2011).

Despite reasonable concern about large financial institutions, since the crisis markets appear to be more, rather than less, attentive to risk. There is thus little evidence that risk taking incentives have become more distorted; if anything, just the opposite is true. Strahan (2013) shows that credit default swap (CDS) spreads reflect risk more after the crisis than before, even for the largest financial firms. The postcrisis patterns suggest that risk takers now face (at least some) costs of their actions in the form of higher borrowing rates. What is harder to assess is why do markets price risk more postcrisis? One possibility is that government bailouts have become less likely for political reasons. Another possibility is that Dodd-Frank is working as intended—by constructing mechanisms to soften the blowback of a large failure, perhaps markets now believe that losses are more likely to be imposed on creditors in the event of distress. Or, perhaps some very large banks have become "too big to save," at least in relation to resources available to governments and central banks facing long-run fiscal imbalances.

With the wide-ranging but partially implemented regulatory changes embodied in Dodd-Frank and the new Basel III capital and liquidity rules, it is too early to assess the consequences for market adaptation, the real economy, and stability of the system going forward. Concerns about issues we have analyzed here, including the potential for conflicts, the incentive consequences of the safety net, and maintaining a competitive, efficient, and stable banking system will play key roles in the debates over future regulatory change.

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