

entry of new banks is encouraged by the existence of deposit insurance and would be further encouraged if the reporting and other regulatory requirements that currently place heavy burdens on small banks were reduced.

Taking all these factors into account, we foresee that competitive forces are likely to continue dominating banking markets for the foreseeable future.

Effect of consolidation on small business credit. Concern has been expressed about the effect of banking consolidation on the availability of credit for small businesses and small farms.³⁴ This concern arises because community banks devote proportionally more of their resources to lending to these borrowers than large banks do. Lending to small business has often been “reputational” in nature, requiring the local expertise that is both characteristic of community banks and more favorable to some small business borrowers, such as new or young firms with limited credit histories. Large banks, on the other hand, are likely to focus more on large borrowers and use credit-scoring and other standardized lending methods in underwriting loans.

On the basis of the available evidence, the effect of consolidation on small business credit appears to be complex and dependent on numerous factors. For example, it has been argued that as banks get larger, they are better able to diversify their portfolios and therefore increase their lending to all borrowers, including small businesses. New credit-scoring models used by large banks may identify borrowers who were previously not able to obtain credit from small banks. Moreover, whether small business lending increases or decreases may depend on whether the acquiring bank already regards small business lending as an important business line. The effect of consolidation on small business credit availability also depends on whether there are other lenders in the market that can offset a merger-related reduction in lending. These effects seem to differ between rural and urban markets and between already concentrated and more competitive markets.

The effect of consolidation on small business lending will continue to be the subject of research. Although the outcome of such research cannot be predicted in detail, one important consideration is the possibility that consolidation may create opportunities for the remaining community banks. Any reduction in small business lending by large banks should invite increased lending by community banks, while also encouraging the formation of new banks to serve the needs of these borrowers. The presence of a substantial community bank sector and the prospect of new market entrants are potentially important safeguards against the possibility that bank consolidation will make small business credit less available.

Combinations of Banking and Commerce

As is well known, banking consolidation has been accompanied by affiliations of banks and other financial service firms. GLB permitted combinations of commercial banks, securities firms, and insurance companies. Looking ahead, one can expect market forces to push in the direction of more mixing of banking and commerce. The underlying policy issues are whether permitting affiliations among banks and commercial entities serves the public interest and, if such combinations are to occur, what is the appropriate regulatory framework for them.³⁵

With respect to the first question, there are two dominant views as to the desirability of maintaining a separation between banking and commerce. Proponents of one view argue that the failure to maintain a line of separation—especially in terms of ownership and control of banking organizations—would have potentially serious consequences, ranging from conflicts of interest to an unwarranted expansion of the financial safety net.

³⁴ Evidence on the effect of consolidation on small business credit is discussed in Avery and Samolyk (2003).

³⁵ The section on combinations of banking and commerce is based on the FOB paper by Blair.

Proponents of the other view argue that, if adequate safeguards are in place, the benefits from affiliations between banking and commerce can be realized without jeopardy to the federal safety net. Among these safeguards are requirements affecting bank capital and the enforcement of firewalls to protect the corporate separateness of the bank.

With respect to the appropriate regulatory framework, the Federal Reserve Board maintains that supervision of the insured bank's parent and affiliated companies is necessary if the associated risks are to be understood and controlled. The FDIC has long argued that national and state-chartered banks, regardless of size or holding company affiliation, should be able to choose the ownership structure that best suits their business needs if adequate protections are present. Thus, at the heart of the debate is the question of whether the public interest requires federal regulatory oversight of the entire banking organization or just of the bank.

Although the current prohibitions on corporate ownership of banks are sometimes defended on the grounds that banking and commerce have always been separate, the history of U.S. banking reveals no evidence of a long-term separation. Certainly the activities permitted to banks have always been subject to prohibitions, but the prohibitions on affiliations with commercial firms that are currently in effect stem from the Bank Holding Company Act of 1956 and its amendments. Despite these regulations and prohibitions, however, extensive links between banking and commerce have existed and still exist. And the market pressure for more business combinations between banks and commercial firms can be expected to continue. Moreover, the potential risks of allowing banking and commerce to mix—conflicts of interest, concentration of economic power, and expansion of the safety net—can be contained through the use of adequate safeguards and firewalls. Thus, these risks do not appear to justify a separation of banking and commerce.

Does the mixing of banking and commerce constitute good public policy? The evidence suggests

that the answer is a qualified yes: with adequate safeguards in place, the careful mixing of banking and commerce can yield benefits without excessive risk. The issue facing policy makers is how these combinations of banking and commerce will be regulated. Specifically, will increasing amounts of commercial activity be subject to umbrella supervision, or will the insured entity be the focus of supervision? Regulators and policy makers should consider what additional powers, if any, are needed for regulators to be able to effectively ensure the corporate separateness of the insured entity, while also ensuring that banks can choose the corporate structure that meets their business needs.

Large-Bank Supervisory Issues

Large, complex banking organizations pose unique challenges to regulators.³⁶ Traditional methods of examining banks were suited for smaller institutions, and as financial institutions became larger and increasingly complex, bank regulation and supervision had to adapt. The regulatory and supervisory issues raised by the growth of these banking organizations may be considered in the context of the New Basel Capital Accord, or Basel II. As is well known, the new accord rests on three pillars:

Pillar 1: Minimum Capital Requirements

Pillar 2: Supervisory Review Process

Pillar 3: Market Discipline.

Pillar 1 (capital requirements). On June 26 2004, the Basel Committee on Banking Supervision released the framework for the new Basel capital accord. It outlines the minimum requirements for credit, market, and operational risk. The target for implementation of the new accord was year-end 2006, with the most advanced approach available for implementation by year-end 2007. The proposed accord includes two primary changes to the current capital standards. First, it modifies the approach to credit risk; second, it includes explicit capital requirements for opera-

³⁶This section is based on the FOB paper by Bennett and Nuxoll.

tional risk. Most U.S. banks will continue to use the existing risk-based capital rules, but all very large, internationally active banks will be required to adopt the new capital standards and to use the Advanced Internal Ratings-Based (AIRB) approach to credit risk. Under the AIRB approach, the probability of default, loss given default, and exposure at default will be estimated internally by the banks. With respect to operational risk, the new accord proposes that banks using the AIRB approach will also estimate operational risk internally.

As a member of the Basel Committee, the FDIC has three basic goals for Basel II: (1) capital regulations should preserve and maintain minimum capital requirements; (2) the standards should be designed so that they may be implemented and supervised effectively in the real world; and (3) any new standards should not produce substantial adverse unintended consequences. Among such unintended consequences is the possibility that smaller banks will be adversely affected compared with large banks. As noted above, the FDIC also believes that a minimum regulatory capital requirement should be adopted in addition to the requirements based on the banks' internal estimates as contemplated by Basel II. This belief is consistent with the FDIC's principle that a strong capital base not only is necessary for a safe and sound banking industry but also can equip the industry to weather downturns in the economy or the onset of unanticipated events.

Pillar 2 (supervisory review). The supervision of large banks is challenging because of the complexity of these institutions. Four sources of complexity are size, geographic span, business mix, and nontraditional activities. Given the sheer volume of transactions and types of assets, it is difficult to gather, aggregate, and summarize information in a manner that is meaningful for risk management. The wide geographic span of these institutions, including both domestic and foreign operations, may obscure correlations among exposures. More sophisticated products and a wider range of business activities also complicate supervision. As major business units are acquired or

sold, the risk profile of the organizations may change considerably. Supervisors will be strongly challenged to develop the expertise necessary for monitoring the activities of large, complex banking organizations, as well as to avoid extending the safety net to nondeposit products.

Pillar 3 (market discipline). Investors in the various securities issued by banks have interests similar to those of supervisors. This similarity of incentives has led to a number of suggestions that supervisors rely on market discipline for information about and control of the riskiness of banks. As also discussed in a later section, there are two critical questions about market discipline. First, do investors know what the bank is doing? Second, can investors control what the bank is doing? Various views have been expressed about whether banks are opaque to the investor, and recent corporate scandals provide grounds for skepticism as to shareholders' ability to control management. The effectiveness of market discipline is likely to remain a subject of further research.

Governance Issues

Failures of corporate governance can cause enormous financial losses, not only to individual corporations and their stockholders but also to society as a whole.³⁷ One widely quoted estimate of the cost of U.S. corporate governance failures is \$40 billion a year, or the equivalent of a \$10 a barrel increase in the price of oil.³⁸ Enron shareholders alone lost \$63 billion in Enron's failure. Recent corporate governance scandals have resulted in new legislative, regulatory, and judicial initiatives to counteract perceived corporate governance failings.

Because of their special and important role in society, banks need to be particularly careful about conflicts of interest, or the appearance of

³⁷ The section on governance issues is based on the FOB paper by Craig.

³⁸ Litan (2002).

them, so as to maintain public confidence. As a result of earlier banking legislation, current bank corporate governance standards are higher than the standards for nonbank enterprises, and most banks to which the Sarbanes-Oxley Act of 2002 applies have little trouble meeting that act's requirements.³⁹ In fact, many of the provisions of this legislation are derived from bank governance standards; this law introduces nonbanking businesses to standards that banks have been observing for years.

However, the combination of the Sarbanes-Oxley legislation and new stock exchange rules, recent SEC actions and recent court decisions, a new activism on the part of blockholders, and heightened public scrutiny of business behavior has produced a changed corporate governance environment, one that continues to evolve. The major changes in this environment that will affect banks are changing norms of board independence, increased shareholder involvement, and changing and uncertain standards of board accountability. In particular, bank interlocking directorships may run up against the changing norms for board independence. In addition, public dismay over excessive executive compensation is likely to stimulate shareholder scrutiny of boards' compensation policies—and likely to increase the pressure on some boards.

Banks, like other businesses, must be prepared to meet these evolving standards of corporate governance. The most effective way to avoid corporate governance problems is to select a knowledgeable, engaged, and independent board of directors. However, increased commitments of time by board members, increased liability issues, an emphasis on financial expertise, and the trend toward more independent boards are likely to make it more difficult for banks, and other businesses, to recruit board members. Some observers suggest that banks and other businesses will need to focus on recruiting people who have traditionally not been members of boards in large numbers—women and both younger and older members: for example, more division directors rather than sitting CEOs, and more retired people

who have the time and expertise to devote to board membership. In this demanding and changing corporate governance environment, banks and other businesses may need to expand their vision of what constitutes a qualified board member.

Financial Services Regulatory Issues

In the 20 years since the last major study of the federal financial regulatory system,⁴⁰ the financial system has continued to evolve and become more complex. Yet, its regulatory system remains rooted in the reforms of the 1930s. Regulation and supervision of large, multi-product, internationally active financial organizations that span numerous federal financial regulatory agencies pose challenges for a system designed largely to regulate smaller, distinct, locally based organizations. Although changes have been made—especially over the past decade—to improve the regulation and supervision of these new financial conglomerates, it is time to take a hard look at the current federal financial regulatory structure.⁴¹

As the financial services industry grows larger and more complex, the question is increasingly raised as to whether our fragmented, piecemeal system of regulation is up to the task. Since the mid-1980s a number of countries have examined their financial regulatory structures and concluded that changes needed to be made. Internationally, the trend has been to consolidate all—or most—financial services regulation within one agency and to move that function outside the central bank.

³⁹ The Sarbanes-Oxley Act applies to publicly held institutions—institutions that issue securities registered with the SEC or with a federal financial regulatory agency. In addition, nonpublic banking institutions with more than \$500 million in assets are required to comply with the SEC's definition of auditor independence.

⁴⁰ See *The Report of the Task Group on Regulation of Financial Services* (1984).

⁴¹ This section is based on the FOB paper by Kushmeider.

Reform of the U.S. financial regulatory structure raises complex issues regarding deposit insurance, the role of the central bank, and the dual banking system. Although many observers would argue that in the absence of a crisis, regulatory restructuring is not a topic that will generate much political interest in the United States, there are issues that will affect how the financial regulatory system is organized and operates regardless of whether full-scale restructuring is desired. Among these issues are funding for the Office of the Comptroller of the Currency and the Office of Thrift Supervision, federal preemption, the resolution of issues that cross functional regulators, and umbrella supervision for all financial conglomerates that own an insured depository institution.⁴²

The options outlined in the paper on which this section is based represent possible ways in which reform or restructuring of the federal financial regulatory system could occur. They focus on the least-intrusive, most easily accomplished reforms (those that regulators could undertake themselves or that require little legislative change) to a full-scale restructuring of the federal financial regulatory system. There are valid arguments for taking either approach or even for finding some middle ground, such as a thorough restructuring of the bank regulatory system. Within each option there is room for debate over how regulation might be structured—for example, what entities might be included. The paper is designed to provide background regarding issues that will influence the debate over regulatory restructuring and to provoke thought and discussion about the design of the U.S. federal financial regulatory system.

Bank Liability Structure

Growth in core deposits (total deposits less time deposits in denominations of more than \$100,000) has failed to keep pace with the corresponding growth in bank assets.⁴³ There may be many reasons, either singly or in some combination, for this phenomenon. The supply of core

deposits may be growing at a slower rate than bank assets, banks may be increasingly using alternative funding sources that have lower costs, and some alternative sources may offer risk reducing features. As all of these explanations are likely to be true, the mix between core deposits and alternative funding sources will continue to change. This prospect suggests continued reliance on wholesale funding sources (such as Federal Home Loan Bank advances and brokered deposits) and efforts to expand other nondeposit sources of funds.

These changes in liability structure raise several issues for banking regulators. The one that has received most attention recently is market discipline—particularly for large, complex banking organizations. The research to date shows that unprotected investors monitor bank performance and respond to changes in risk exposure. Supervisors play an important role in ensuring that markets have accurate data on banks, since troubled banks otherwise may overstate capital. The evidence is weaker on the ability of markets to encourage banks to reduce their risk exposure when trouble arises. And for the very largest banks, market discipline may be diminished by the perceptions of market participants that such banks are too big to fail—that is, the perception that uninsured depositors and other creditors would be protected if the institution failed. In the future, more emphasis should be put on disclosing information to the markets as well as on increasing the use of market data to inform and enhance the supervisory process.

Another issue raised by banks' heavier reliance on wholesale funding sources and rate-sensitive deposits for funding is liquidity risk exposure, which has increased. Regulators have responded by updating their examiner guidance on liquidity risk. It may also be worthwhile to seek better ways

⁴² The last issue has implications for the operation of U.S. financial conglomerates in Europe, where they must meet a requirement for consolidated supervision.

⁴³ This section is based on the FOB paper by Bradley and Shibut.

to measure liquidity risk and better ways to handle the operational challenges associated with liquidity failures.

A third issue concerns the assessment base, and a fourth concerns depositor preference. To the extent that asset growth is funded by nondeposit liabilities, the exposure of the FDIC tends to increase without any increase in the assessment base on which premiums are calculated. (The assessment base is essentially the amount of domestic deposits after certain adjustments.) In the past, various proposals were advanced to expand the assessment base. And changes in the liability structure have highlighted the importance of domestic depositor preference when banks fail. Some observers have questioned the cost savings attributed to the present priority provision and have pointed to the provision's potential effects if a multinational banking organization were to fail. In light of changes in the structure of bank liabilities, it may be useful to consider the advisability of revising the assessment base to ensure that premiums are properly aligned with the risks to which the FDIC is exposed, and the advisability of reviewing the effects of the present system of domestic depositor preference.

The Economic Role of Banks

Historically, banks have been regarded as a special class of intermediary because they perform four unique functions: (1) they issue transaction accounts that have universal acceptability and are available at par on demand, (2) they fund idiosyncratic (and illiquid) loans with liquid liabilities, (3) they serve as backup sources of liquidity, and (4) they play a key role in the transmission of monetary policy.⁴⁴ Consequently, policy makers have maintained a government safety net that protects and regulates the banking industry to ensure that it operates with minimal disruption. Yet, over the past quarter of a century, revolutionary advances in IT and telecommunications have combined with the economic and political forces of globalization and deregulation to fundamentally alter the operations of financial intermediaries (both bank and nonbank) and the markets in

which they operate. One result of these changes is that financial markets are much more complete, efficient, and competitive today than they were 25 years ago. This development has led some observers to argue that banks are no longer unique among financial institutions and therefore do not merit the current level of government protection or regulation.

This study concludes, however, that banks have not lost their importance as financial intermediaries and that they have in fact evolved to meet the challenges and demands of the new world of finance. Banks, for example, are still at the center of the payments system. Indeed, virtually every financial transaction that involves a net transfer of wealth is still eventually settled through the banking system. Banks also continue to play an important role in the transmission of monetary policy. And despite signs of disintermediation and what some see as a decline in the relative importance of banks, banks continue to serve as the primary sources of credit to important segments of the economy (such as small businesses and small farms).

Moreover, as the capital markets have become more developed, banks have evolved to provide important behind-the-scenes support to much of the intermediation activity that occurs elsewhere. For example, almost all commercial paper issues are backed by bank-issued stand-by letters of credit that enhance the paper's credit rating and increase its liquidity. In securitizations, banks are involved in originations, servicing, and monitoring and in the provision of credit enhancements. In this respect, banks remain an important player in the intermediation process even though they are no longer the primary lender or the direct source of the loaned funds. Finally and perhaps most importantly, as has been demonstrated repeatedly during a number of financial panics and crises in the United States over the last three decades, banks play an essential role as emergency sources of liquidity to the rest of the financial sys-

⁴⁴ This section is based on the FOB paper by Jones.

tem and to the broader economy as well. Indeed, several studies have shown that banks may in fact have a comparative advantage in providing liquidity on demand.

In conclusion, ample evidence is available to support the position that banks (and the business of banking) are not fading away. Rather, in the more complex, sophisticated, and volatile financial world of the twenty-first century, banks' importance may actually be growing.

Concluding Comments

This study views banking as a strong, competitive industry that continues to serve useful economic purposes. Within the banking industry, we conclude that each of the three main sectors—community banks, regional and other midsize banks, and the largest banking organizations—has favorable prospects for the years immediately ahead, even though the number of institutions is likely to decline further. What could materially diminish these relatively favorable prospects?

With respect to community banks, a number of competitive and regulatory developments could diminish their market role and viability. One possibility is that credit-scoring and other financial technology used by large banks and nonbank financial companies could advance to the point that it would supplant the relationship lending practiced by community banks in financing local credit needs, including those of small businesses and small farms. And large banks might adopt organizational structures more conducive to reputational lending—for example, by giving branch managers more authority. The consequences might be analogous to the results in home mortgage lending, where a nationwide market has much diminished the role once played by local portfolio lenders. Given the heterogeneous nature of small business loans and the organizational problems of controlling the activities of far-flung branch systems, this result does not seem likely in the time frame of this study—five to ten years—but it cannot be ruled out completely or indefinitely.

The burden of reporting and other regulatory requirements could also threaten the prospects for community banks. Although the banking industry as a whole is a politically attractive vehicle for implementing various nonbanking political and social programs, the fixed costs of such requirements fall particularly heavily on smaller banks. The resulting regulatory burden could have effects analogous to those of earlier regulations that weakened the ability of banks to compete with credit unions and other nonbank institutions not subject to similar burdens.

Community banks that lack adequate IT staffs are also exposed to the possibility of attacks on the software products they use. In addition to the direct losses they might suffer, the inconvenience to their customers and the damage to their reputations could be a serious competitive disadvantage.

For large banks, the principal issues are the risks associated with size and diversity—the very features that are these banks' main strengths. Problems identifying and mitigating correlated risks, reputational risks arising from potential conflicts of interest and lapses in governance, and operational risks associated with IT systems are among the most prominent of the risks faced by large banks.

For all banks, the possibility of economic bubbles in markets where banks participate, like the bubbles in energy, agriculture, and real estate markets during the 1980s, cannot be entirely discounted. This is particularly so as economic and financial decision making related to banking is increasingly in the hands of those who have experienced nothing but profits.

We consider these and similar possibilities to be low-probability, high-impact events within the five- to ten-year horizon of this study. In many cases these possibilities are being addressed by bank management and bank supervisory agencies. Nevertheless, it is important to keep them in mind as a cautionary accompaniment to the relatively favorable picture of banking painted in this study.

The Future of Banking

At the same time, important policy issues will continue to command the attention of bankers and bank regulators. The consolidation of the banking industry highlights the challenges of supervising large, complex banking organizations. The possibility of large-bank failures poses risks not only to the deposit insurance funds but also to the banking system itself. Market forces are likely to push for more business combinations of banks and commercial firms, raising again the issue of how best to regulate such combinations.

The existing regulatory structure appears to be increasingly out of alignment with the rapidly changing financial products and markets. The nature of the safety net itself may need to be reexamined to ensure that it effectively accommodates an industry characterized by a few megabanks alongside thousands of community banks. These difficult issues are likely to be prominent in discussions of the future of banking in the years ahead.

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The Future of Banking in America

The Evolving Role of Commercial Banks in U.S. Credit Markets

by Katherine Samolyk*

SUMMARY

How important a role do commercial banks play in funding nonfinancial borrowing? Ten years after the end of the industry's most significant crisis since the Great Depression, does banking remain a major player in financing the nation's economic activity? This paper examines the evolving role that commercial banks play in U.S. credit markets.

The available data reveal several consistent patterns over the past two decades. First, there has been a permanent increase in the overall borrowing capacity in credit markets—in other words, an increase in the credit market pie associated with the functioning of the economy. This increase was associated with a decline in the share of domestic nonfinancial borrowing that is directly funded by commercial banks. When debt growth leveled off in the early 1990s, so did commercial banks' share of this credit-market pie. Banks' smaller share of the credit-market pie reflects a dramatic shift in the way loans to households and businesses are being financed. Specifically, asset

securitization (the pooling of loans and their funding by the issue of securities) has allowed loans that used to be funded by traditional intermediaries, including banks, to be funded in securities markets.

The data also reveal, however, that commercial banks still play a significant role in funding business borrowers: we estimate that the share of nonfinancial business borrowing that commercial banks fund on their balance sheets has not declined notably in five decades. Nevertheless, there has been a clear shift in how banks lend—a shift from shorter-term lending not secured by real estate to loans collateralized by business real estate. This shift may reflect banks' continuing comparative advantage in real estate lending, a form of lending less well suited to the standardization necessary for asset securitization.

With respect to borrowing by households, in contrast, we find that the securitization of home mortgages and—more recently—of consumer credit has reduced the extent to which these types of loans are directly funded by commercial banks (and savings institutions). This finding is consistent with the broadening of household-sector credit markets over time; longer-term increas-

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es in borrowing by households have generally not been associated with greater intermediation through banks. The securitization trend, however, has had a more severe effect on savings institutions than on commercial banks.

At the same time, the commoditization of credit markets—that is, the standardization, unbundling, and repackaging of payments and risks associated with credit flows—makes it harder to measure the importance of banks as well as other intermediaries in providing credit-related services. Balance-sheet data on who is funding loans can be a poor proxy for who is providing the financial services associated with the credit flows. Commercial banks, particularly larger institutions, provide significant services in originating, servicing, and enhancing the liquidity and quality of credit that is ultimately funded elsewhere. Hence, market-share measures based on balance-sheet data are likely to understate the importance of banks to a greater extent than even a decade ago. The provision of financial services is, however, reflected in bank earnings. And indeed, when one looks at income-based measures of market share, one does not see any evidence of a secular decline in the importance of commercial banking.

Thus, the conclusion of this study is that although the role of commercial banks in U.S. credit markets has certainly evolved, banks remain a critical part of the modern flow of funds that has broadened the availability of credit in the U.S. economy.

Introduction

Banks have historically been viewed as playing a special role in financial markets for two reasons. One is that they perform a critical role in facilitating payments.¹ The other is that they have long played an important, although arguably less exclusive, role in channeling credit to households and businesses. Commercial banks, as well as other intermediaries, provide services in screening and monitoring borrowers; and by developing expertise as well as diversifying across many borrowers, banks reduce the costs of supplying credit.

Thus, in their role as lenders, banks are often not merely buying someone's debt; rather, they are providing significant financial services associated with extending credit to their customers.² And to the extent that investors want to hold bank liabilities, banks can fund borrowers directly.

In the early 1990s, as the U.S. banking industry emerged from its most significant crisis since the Great Depression, policy makers were asking whether the importance of banks in financing economic activity had become permanently diminished.³ Now, ten years later, the share of domestic debt funded on commercial-bank balance sheets stands at just over 20 percent, down from 30 percent three decades ago. Commercial bank loans now account for only 60 percent of short-term borrowing by nonfinancial businesses, compared with 75 percent in the mid-1970s.⁴

Even now, therefore, when profitability and other measures of performance indicate that banking has rebounded from the crisis, the role of banks in U.S. credit markets remains under scrutiny. Other types of financial intermediaries and financial instruments appear to have become more important in channeling funds to businesses and households. Stories about competition from other segments of the financial-services industry continue to be reported in the popular press. For

¹ Banks issue liquid deposit accounts that can be easily used to make payments; banks also make the payments. The special liquidity of bank liabilities and the extent to which they serve as a means of payment are reflected in the fact that deposit liabilities are included in various measures of the money supply. Seminal works discussing the special role of money and banks include Gurley and Shaw (1960), Tobin (1963), Fama (1980), and Diamond and Dybvig (1983).

² Two frequently cited papers that analyze the importance of banks as lenders are Diamond (1984) and Fama (1985). Of course, banks can and do hold credit-market instruments issued by others—including securities issued by the U.S. government and government agencies—although in some sense this involves less of a provision of banking services per se. When a bank invests depositors' funds in corporate or government securities, it is not providing the same banking services as when it originates a loan. Rather, the bank is simply buying securities that were issued in (and could easily be resold in) direct capital markets. Mutual funds, as well as individual investors, can do the very same thing.

³ Indeed, one decade ago, the title of the May 1994 Federal Reserve Bank of Chicago Conference on Bank Structure and Competition was "The Declining [?] Role of Banking."

⁴ These market-share measures are the author's estimates based on Federal Reserve Flow of Funds Account data and are described in more detail below.

example, according to a fairly recent report in the *Wall Street Journal*,

The financial services arm of General Electric Co. [GE Capital] illustrates how nontraditional lenders are taking over from banks as suppliers of credit to big slices of the U.S. economy. . . . Twenty years ago, banks and thrifts supplied 40% of the economy's credit. . . . Today it is down to 19%. Housing financiers Fannie Mae and Freddie Mac own about as many residential mortgages as all commercial banks combined.⁵

This paper assesses the evolving role of commercial banks in U.S. credit markets during the past decade. We use available data to quantify the importance of banks as credit providers—that is, their “market share”—taking a historical perspective in assessing credit-market trends. Not surprisingly, we find that the importance of banks depends on the markets one chooses to consider and on how one measures banking services. However, some consistent patterns emerge. From a historical perspective, we now see that the debt buildup of the 1980s was actually a permanent increase in the volume of debt associated with economic activity in the United States. In other words, the credit-market pie to be divided up among financial-service providers is now substantially larger than it was 20 years ago. And although overall the provision of credit by banks has kept pace with the growth of the economy, the capacity of the broader financial sector has grown by much more. Accordingly, the share of our economy's debt that commercial banks fund directly has fallen relative to the growth of the credit-market pie, reaching its low point in 1993 and then stabilizing.

An important dimension of these trends that is not always emphasized is the dramatic change in the way credit flows in our economy are being funded. Traditionally, intermediaries funded portfolios of loans (and bonds) by issuing very different types of liabilities (mainly deposits and insurance and pension liabilities) to investors. But the growth of credit-market activity in our

economy during the past two decades has been associated with the rise of intermediation in the form of asset securitization, referring to the pooling of loans and their funding by the issue of securities. Asset securitization reflects a fundamental transformation of loan markets, particularly those where households borrow.

Home-mortgage and consumer-credit markets have become commoditized, in the sense that these loan products have become more standardized commodities, allowing the attendant credit-related services to be unbundled, repackaged, and provided by a variety of financial-service providers. Moreover, standardization extends beyond the terms of the loan contracts to the underwriting and pricing process, in which characteristics of the borrower are increasingly linked to the use of statistical models in extending and pricing credit.

The commoditization of credit often generates more layers of intermediation between investors and the borrowers who ultimately receive the funds. Intermediation funded by issues of securities is often “re-intermediated” (for example, through mutual funds, insurance companies, or pension funds). The layering makes it harder to quantify the importance of banks (as well as other intermediaries) in channeling credit from savers to borrowers because it makes it more difficult to identify who is ultimately funding certain types of loans. And quantifying the value-added of the additional layers of intermediation is difficult as well.

Nonetheless, according to some fairly standard measures, we find that commercial banks still play a significant role in channeling credit. With respect to business lending, we find that not only are banks important for small business borrowers, but they also remain remarkably important for all business borrowers: we estimate that the share of nonfinancial-sector business borrowing that commercial banks fund directly has not declined notably in five decades. There has, however, been a dramatic shift in how banks lend, a shift from shorter-term lending not secured by real estate to loans collateralized by business real

⁵ Ip (2002).

banks, mutual funds, and other holders of corporate debt, we estimate the shares that are nonfinancial issues.¹⁰

Post-War U.S. Credit-Market Trends through the Early 1990s

To understand the dramatic transformation of U.S. credit markets, it is necessary to look at historical trends leading up to the banking-sector problems of the 1980s and early 1990s and the apparent decline in the importance of commercial banks as credit providers.

From the 1950s through the early 1980s, domestic nonfinancial borrowing (by households, nonfinancial businesses, and governments) grew roughly at the same rate as economic activity (measured in terms of economic output—Gross Domestic Product, or GDP). Indeed, the ratio of debt owed by domestic nonfinancial sectors to GDP was remarkably stable—so stable that it became a “stylized fact” used by economists in analyzing macroeconomic issues such as the effects of federal deficits (Friedman [1978], Friedman [1980]).¹¹ But although total nonfinancial debt grew roughly at the same pace as overall economic activity, borrowing by particular nonfinancial sectors did not grow at the same rate: the share of borrowing by households and nonfinancial businesses grew faster as the share of debt owed by the federal government (accumulated during WWII) declined.

During this time, the number of commercial banks in the United States was growing; thus, the industry continued to be made up of a large number of banks that tended to be very geographically localized (partly because of branching restric-

¹⁰ So, for example, when looking at the commercial banking sector to measure the share of nonfinancial-sector debt that it is funding on the balance sheet, we estimate the share of the banking sector's holdings of commercial paper that are nonfinancial issues. Specifically, we use the share of outstanding commercial paper issued by domestic nonfinancial corporations as an estimate of the share of commercial banking's holdings that consist of nonfinancial issues. The same method is used to estimate holdings of nonfinancial corporate bonds.

¹¹ For an analysis of debt and money growth in the U.S. prior to 1950, see Gurley and Shaw (1957).

tions). Banks also faced public policies that restricted entry, oversaw mergers, and regulated permissible activities.¹² On the liability side, commercial banks were limited in terms of the types of liabilities they could issue and the rates they could pay depositors. They were generally relegated to the business of making (primarily) business loans and providing transaction accounts (or close substitutes) in fairly localized areas. They were also an important funding source for the federal government. Thus, for investment banking and insurance services, individuals and corporations had to go to other financial-service providers. The phenomenon of the bank holding company was a response to restrictions on the scale and scope of banking. A larger banking organization could be formed if banks were held as affiliates, and if nonbank financial firms were held as affiliates, the holding company could expand the scope of its activities to encompass certain permissible lines of financial services. Of course, as holding companies evolved, they too fell under regulatory scrutiny.¹³

The interplay that always exists among policy, regulation, and financial-market trends was evident during this three-decade period, particularly with respect to interest rates on deposit accounts. Rates on these accounts were regulated, but in 1962 the marketable large certificate of deposit (CD) was created to circumvent interest-rate ceilings and enable banks to pay market rates to attract funds. On the asset side of the balance

¹² Permissible activities were severely curtailed because of the bank failures of the 1930s, but the decentralization of the industry stems more broadly from a historical distrust of both centralized political control and concentrated market power. The dual banking system allowed banks to choose whether to be chartered by state agencies or by the Comptroller of the Currency (the choice of charter determined who would regulate a bank). Interstate banking was prohibited by the McFadden Act, and states themselves regulated intrastate branching. The Glass-Steagall Act prohibited banks from engaging in investment banking activities. For a discussion see Wheelock (1993).

¹³ The Bank Holding Company Act of 1956 made all multibank holding companies subject to regulation by the Federal Reserve Board and prohibited further interstate holding company acquisitions. In 1970, amendments to this act reined in the permissible activities of one-bank holding companies, which had proliferated as a means of circumventing regulations imposed by the 1956 act. One effect of these amendments was to remove any disincentives for organizations to acquire multiple bank affiliates (albeit within the home state), which they did. For a provocative assessment of the 1970 holding company amendments as well as a lively overview of post-war U.S. banking history, see Chase (1994).

sheet, after credit crunches in the late 1960s threatened the availability of bank credit to commercial firms, the commercial-paper market became considerably more active (Judd [1979]); in effect, banks were making fewer loans to prime corporate clients.¹⁴

Through the mid-1970s, commercial banks continued to be special both in their role as lenders and as a transmission mechanism for the implementation of monetary policy (Friedman [1981], Fama [1980], Wojnilower [1980]). Of all the financial intermediaries issuing claims to raise funds from investors, commercial banks were the only ones allowed to issue demand deposits that could be used as a direct means of payment, although demand deposits could pay no explicit interest.¹⁵ Meanwhile, for most businesses, the costs of direct finance—that is, the raising of money by issuing and placing bonds or commercial paper—were prohibitive enough that their most attractive source of funds remained commercial banks. And of course commercial banks, as well as savings institutions, were afforded federal deposit insurance. Hence, despite regulatory restrictions, periodic credit crunches, and economic downturns, the U.S. commercial banking industry performed quite well in the three decades following WWII. And although commercial banks' share of nonfinancial-sector debt dipped slightly as the war-related federal debt was drawn down,¹⁶ it rebounded as borrowing by households and businesses increased during the 1960s and early 1970s (see figure 3).

¹⁴ In the mid-1960s the term *credit crunch* was coined to refer to periods when nominal interest rates rose above regulatory ceilings and banks faced disintermediation as depositors withdrew funds to earn higher returns available in direct credit markets. For discussions, see Burger (1969) and Wojnilower (1980).

¹⁵ The other direct means of payment was cash held by the public. Savings institutions issued passbook savings accounts, which paid interest but the rates they could pay were subject to ceilings (and after 1962, savings institutions also issued CDs). Commercial banks, too, could issue passbook savings accounts, which were subject to Regulation Q interest-rate ceilings. Although savings institutions could issue close substitutes for money (passbook savings accounts with liberal withdrawal terms), these institutions had to maintain a high ratio of residential mortgage lending to total lending in order to qualify as a thrift institution. Meeting the qualified-thrift-lender test allowed a savings institution to borrow at Federal Home Loan Banks, which were an important source of funding during credit crunches.

¹⁶ Commercial banks held large amounts of government debt in their portfolios in the post-WWII years.

With the mid-1970s came a severe recession paired with high inflation; however, relatively few banks failed. The number of commercial banks (and banking organizations) was still increasing, although at a slower pace than banking assets. Thus, although there were more banks, banks were also, on average, getting larger as the industry established more branches (Savage [1982], Rhoades [1985], Amel and Jacowski [1989]). Banks were also becoming increasingly “complex” in terms of their off-balance-sheet activities (such as issuing standby letters of credit that promise to pay in the event of nonpayment of a third party), which caught the attention of policy makers and researchers at the time because of their implications for bank safety and soundness (Lloyd-Davies [1979]; Wolkowitz et al. [1979]; Goldberg and Lloyd-Davies [1985]; Benveniste and Berger [1986]).

At the end of the 1970s, the pace of financial-market change escalated significantly (Simpson [1988]; Berger, Kashyap, and Scalise [1995]). High nominal interest rates, ceilings on the interest that could be paid on deposits, and better information processing made the formation of money-market mutual funds a cost-effective proposition (Mack [1993]).¹⁷ These funds added to the competition associated with the creation of NOW (Negotiable Order of Withdrawal) accounts by savings institutions in the mid-1970s.

Ultimately, deregulation was implemented in the 1980s to allow banks to compete more effectively: interest-rate ceilings were raised (and were later eliminated), and commercial banks (and thrifts) were allowed to offer a wider range of deposit accounts to attract depositors. But in the meantime, evolving financial technologies were permanently altering the way financial markets channeled capital to investment opportunities in the U.S. economy. Technical innovations in information processing reduced the costs associat-

¹⁷ These funds—which held very safe, liquid, money-market assets; maintained par value for their shares; and allowed some transaction privileges—became a popular alternative to bank deposits. They lack deposit insurance but also carry fewer regulatory costs.

The Future of Banking

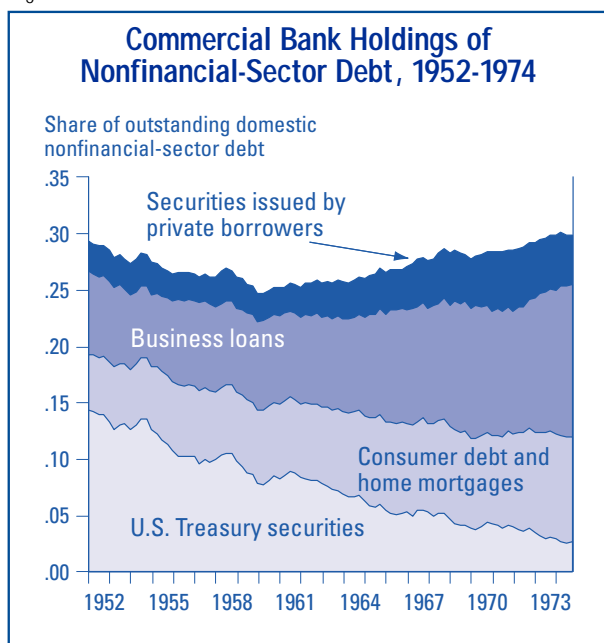
ed with financial transactions, and the result was a proliferation of new products and new providers of financial services, as well as the growth of existing ones. In particular, asset securitization became an increasingly important means of funding loans that had been traditionally funded by banks.¹⁸

As noted above, the origins of asset securitization can be traced to the pooling and funding of mortgages by the government-sponsored agencies involved in the secondary mortgage market. But by the late 1980s, securitizations of loans by private asset-backed-securities (ABS) issuers had become a viable means of funding other types of loans, such as consumer loans.

On the liability side, financial-sector development in the 1980s also increased the competition that banks faced (Simpson [1988]). Depository-institution deregulation allowed savings institutions to issue the same types of deposits as banks. But more significantly, a growing mutual-fund industry in tandem with the regulatory shift

¹⁸ Early articles assessing this phenomenon include Pavel (1986), Cummings (1987), and Carlstrom and Samolyk (1993).

Figure 3



toward defined-contribution pension plans served to channel the funds of smaller investors into direct debt (and equity) markets. Not surprisingly, it has been argued that the mutual-fund industry helped to reduce the role of depositories in credit markets (see Mack [1993] and Fortune [1997], for example).

The evolution of financial-market technologies on both sides of the balance sheet contributed to a dramatic increase in credit flows to nonfinancial businesses and households, even while the federal government was running large deficits (figure 4). After three decades of relative stability, nonfinancial-sector borrowing increased sharply as a ratio to GDP, from about 1.3 in 1981 to more than 1.8 by 1989. Financial intermediation—including a growing volume of securitized assets—increased in tandem with the economy’s appetite for debt. From the perspective of researchers and policy makers at the time, the debt buildup was of great concern, particularly the question of whether it was a debt bubble that was going to burst in an economically detrimental fashion (Federal Reserve Bank of Kansas City [1986]).¹⁹ In addition, the transformation of the asset menu available to investors through banks and other intermediaries disrupted the historical relationships between monetary aggregates and nominal output that the Federal Reserve Board used in conducting monetary policy.²⁰

Commercial banks, once the dominant type of financial intermediary, did not appear to share in the proliferation of financial-sector activity during the 1980s. The national expansion was accompanied by regional economic downturns (related to troubled industries, including oil and farming) severe enough to take down local banks (FDIC [1997]). By the early 1990s the condition of the industry was marked by crisis, failures, and consolidation; this was an industry under siege by

¹⁹ In 1986, the annual symposium sponsored by the Federal Reserve Bank of Kansas City was entitled “Debt, Financial Stability, and Public Policy.” Policy research at this time also focused on the growth of borrowing by both nonfinancial businesses and households. For example see Pearce (1985), Faust (1990), Altig, Byrne, and Samolyk (1992), and Carlson (1993).

²⁰ For discussions, see Carlson and Samolyk (1992); Duca (1992); Orphanides, Reid, and Small (1994); and Friedman (1993).

competitors. Banking-sector problems continued as real-estate markets collapsed on both coasts, taking their toll on exposed institutions. And even as the industry returned to a healthier state, the consolidation trend did not appear to be abating.²¹

In addition, the importance of commercial banks measured in terms of credit flows seemed to be declining. Between 1974 and 1994, the share of domestic nonfinancial-sector debt that was advanced by U.S. commercial banks declined from 30 percent to just over 20 percent (see figure 5). Savings institutions—most like banks in terms of their funding (deposits), regulations, and decentralized industry structure—faced similar issues and appeared to be faring even worse.

²¹ By year-end 1994, the number of commercial banks had declined from a 1984 post-war high of over 15,100 to roughly 10,500, and average bank size had risen from roughly \$250 million to \$360 million in inflation-adjusted 1996 dollars. (The number of savings institutions—savings banks and savings & loan associations—was also declining, from more than 3,600 in 1985 to just over 2,100 in 1994.) In addition to merging charters, more institutions were becoming affiliates of bank holding companies. Thus, if the bank holding company is considered the relevant measure of an individual banking organization, the number of firms in the industry declined even more. By year-end 1992, 71.7 percent of domestic commercial banks were affiliates of bank holding companies. For discussions, see Savage (1993), Samolyk (1994a), Holland et al. (1996), and Rhoades (1996).

The Declining Role of Banks?

A host of studies assessing the evolving role of banking were published in the wake of the banking crisis of the 1980s and early 1990s. These papers were written in the context of what had become a decade-long consolidation trend, an even longer-term decline in bank market-share measures, and concerns about a credit or capital crunch.²² Not surprisingly, opinions about the “declining” role of commercial banking differed.

One view was that changes in the financial sector—evidenced by the increasing competition from nonbank financial-service firms—reflected a decreasing need for banks. From this perspective, consolidation could be viewed a response to excess capacity in the banking industry.²³ Others argued that the evidence did not support either the popular claims that large banking firms were more efficient than smaller firms or the notion that the industry was consolidating to eliminate excess capacity. Rather it was suggested that pub-

²² As noted in above, concerns about disruptions to the traditional linkages between standard monetary aggregates and output also led to much research focusing on the implication for monetary policy. Also see Higgins (1992).
²³ For examples, see Kaufman (1993) and Gorton and Rosen (1995).

Figure 4

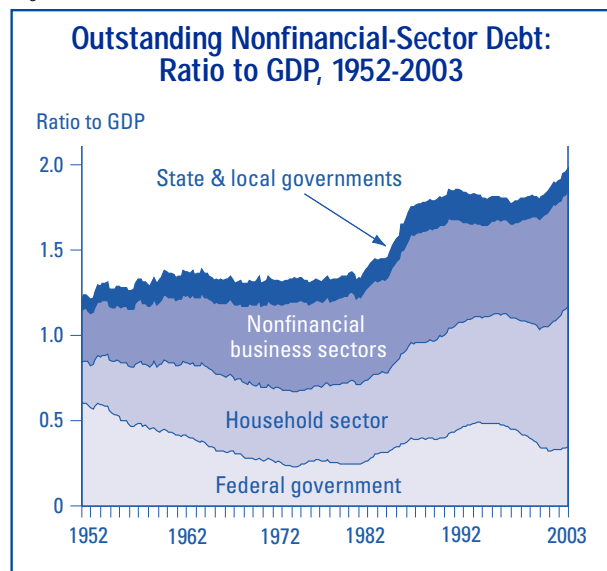
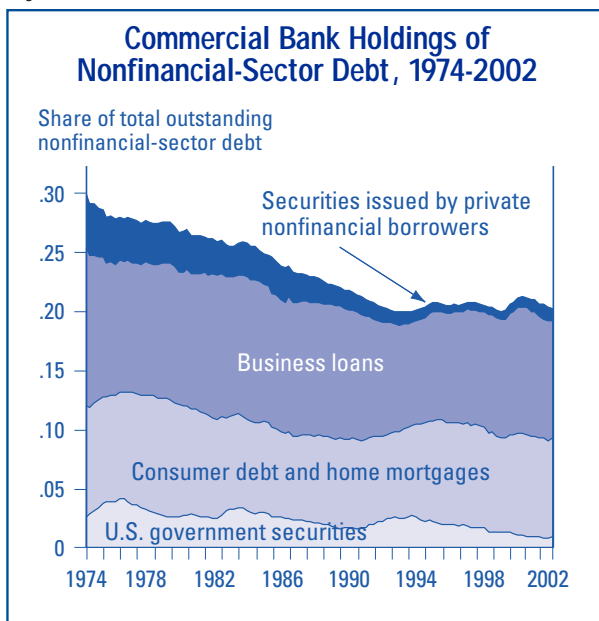


Figure 5



lic policies rather than performance gains were encouraging banks to merge.²⁴ More sanguine observers argued that banking was a battered but viable industry that needed industry consolidation and regulatory reform if it was to adapt to the evolving financial environment. In this environment, such observers argued, larger banks with broader banking powers would be able to compete by providing more services at lower costs and by spreading the costs of new banking technologies over more customers. In addition, as banks became larger and expanded geographically, the geographic scope of their activities would make them less vulnerable to the localized economic problems that had plagued banks during the 1980s and early 1990s.²⁵

Others research argued that when bank balance-sheet data were looked at in isolation, they understated the share of financial services provided by banks in the broader financial sector. Boyd and Gertler (1994b) conducted perhaps the most extensive examination in this regard, documenting a host of alternatives to standard measures of balance-sheet market share. These alternatives quantified activity in the banking sector relative to activity in the broader financial sector or in the entire economy. The term “activity” is purposely general because Boyd and Gertler quantified banking-sector activity (and the activity of other financial-service providers) in numerous ways; they used measures that adjusted credit flows to reflect off-balance-sheet activities as well as measures of profitability, employment, and compensation.

Boyd and Gertler argued that a careful reading of the evidence did not support the view that banking was in decline. Although on-balance-sheet assets held by commercial banks had declined as a

share of total assets held by intermediaries, they noted that this measure ignored the substantial growth in banks’ off-balance-sheet activities, in offshore lending by foreign banks, and in the size of the financial-intermediation sector. They found that when measures of bank assets were adjusted for these considerations, the measures showed no clear evidence of long-term decline. Neither did an alternative “value-added” measure, constructed with data from the national income accounts. As Boyd and Gertler concluded, “At most, banking may have suffered a slight loss of market share lately. But this loss is a temporary response to a series of adverse shocks rather than the start of a permanent decline.” Thus, by defining banking more broadly to include financial services that do not appear on bank balance sheets, the data did not indicate an industry in decline.

Finally, others argued that banks were still important to certain borrowers—particularly households and businesses that continued to rely on banks for credit.²⁶ Samolyk (1994b) analyzed bank market share from this perspective, distinguishing between bank lending and other asset holdings (such as securities holdings) and arguing that lending involves more intermediation services than holding securities does. Using FFA data to look at the markets where households and businesses borrow, that study found shifts in how banks were funding private borrowers, but the overall decline in market share was less than might have been expected. As business lenders, banks were facing increased competition from finance companies and direct credit markets;²⁷ the broadening of the commercial-paper market

²⁴ For examples, see Boyd and Graham (1991) and Boyd and Gertler (1994a). These studies suggest that the formation of very large institutions reflected regulatory incentives rather than attempts to become more efficient.

²⁵ For example, see Wheelock (1993). Generally, more sanguine analysts argued that institutions had to be larger to meet the competition for traditional bank services, to develop new products, and to diversify geographically. Samolyk (1994a) presented evidence that regional disparities in economic conditions did indeed explain much of the poor performance of banks (including large banks) during the 1980s and early 1990s.

²⁶ Small businesses and households have traditionally relied on financial intermediaries (particularly banks) for credit because of these borrowers’ small financial size and the information-intensive nature of the task of assessing their creditworthiness.

²⁷ Finance companies, which faced less regulation of the geographic scale and scope of their activities, had gained significant ground during the 1980s and early 1990s. Some finance companies are captive funding vehicles for large conglomerates (e.g., GMAC Finance), whereas others are independent firms that extend credit to a particular sector. Some are subsidiaries of bank holding companies and, as such, allow the holding companies to broaden the scale or scope of their activities and avoid banking regulations. Within their respective specialized lending areas, finance companies diversify across many borrowers and develop expertise in transforming the risks associated with their particular types of loans. By so doing, they reduce overall portfolio risks and

provided an alternative to banks as a funding source. However, as of the early 1990s, the securitization of business loans had not really taken hold yet, and the share of business mortgages funded by banks was actually increasing. Meanwhile, the share of home mortgages and consumer credit that banks were funding was similar to the share they had funded in the early 1960s. Moreover, although asset securitization was becoming a more dominant way to fund household-sector borrowing, during the 1980s asset-backed lending grew more at the expense of savings institutions and finance companies than of commercial banks.

During the 1990s, survey data obtained from households and businesses also became important sources of information about the markets in which banks competed as lenders. These data were particularly useful because they yielded disaggregated pictures of the financial services used by households and by businesses. For example, data from the triennial Survey of Consumer Finances (SCF) were used to study the nature of rising household-sector debt ratios during the 1980s and early 1990s.²⁸ Kennickell, Starr-McCluer, and Sunden (1997) found little evidence of a serious rise in debt payment problems even though more families had debt, and more of it.²⁹ On the other side of the household balance sheet, the share of families who owned equities, and the amount of their holdings, were also rising. The FFA data, too, indicated rising debt burdens and equity holdings in the household sector, but the SCF data were important because they

the risk-adjusted costs of funding their activities. In addition, the evolution of the commercial-paper market has been viewed as contributing to the success of those finance companies that shifted to commercial paper as a dominant funding source rather than borrowing from banks (D'Arista and Schlesinger [1994]).

²⁸ The SCF has been gathering data on balance sheets and the use of financial institutions by U.S. households since 1983. For example, see Avery and Kennickell (1993) and Kennickell and Starr-McCluer (1996). The most direct precursors of the SCF were the 1962 Survey of Financial Characteristics of Consumers and the 1963 Survey of Changes in Family Finances. For a discussion of survey evidence regarding small business financing trends from the early National Survey of Small Business Finances see Cole and Wolken (1993).

²⁹ This paper uses data from the 1995, 1992, and 1989 SCFs to examine changes in the balance sheets and income of U.S. families and in the kinds of institutions where households obtained their financial services. Also see Avery and Kennickell (1993) for trends in the SCF data between 1983 and 1986.

indicated that aggregate increases were associated with the use of these financial instruments by a broader range of households (as opposed to increased usage by previously active households).³⁰

Another interesting vein of research during the 1990s examined whether the services provided by banks—such as lending—are different from those provided by other financial-service firms in ways that do not appear on a balance sheet. Using data on individual loans, Carey, Post, and Sharpe (1996) compared corporate lending by banks with corporate lending by finance companies.³¹

Although their evidence suggested that both of these intermediaries were special in solving informational problems, the two types of institutions did not make the same types of loans. Although banks and finance companies competed across the spectrum of borrower risk, finance companies tended to serve observably riskier borrowers, especially highly leveraged ones.

Passmore and Laderman (1998) investigated whether there were differences between savings associations and commercial banks that would result in reduced lending to traditional mortgage borrowers if the savings-association charter were eliminated. Their empirical tests did not indicate significant differences between savings associations and commercial banks, suggesting that elimination of the savings-association charter would not impair home mortgage credit availability.

A final vein of research that gained prominence in the 1990s examined whether the consolidation of the banking industry into large organizations adversely affected the availability of credit to

³⁰ The FFA and the SCF do not always paint the same picture of household-sector balance sheets. Avery and Kennickell (1991) and Antoniewicz (1996) show that although some asset and liability categories in the SCF and the FFA are quite close, measures of liabilities tend to match up better than asset categories.

³¹ Although commercial banks have long been viewed as competing with savings institutions and credit unions for deposit funding, finance companies represent competition on the asset side of the balance sheet, for they have a long history of lending to businesses and households (although they do not fund their portfolios by issuing deposits).

small businesses.³² This literature did not directly yield evidence about bank market share vis-à-vis the nonbank competition, but it raised the important question (somewhat overlooked in many bank market-share analyses) of whether banks might be willingly reducing the services they supplied to certain customers, such as small-business borrowers. If they were (or are), one would hope that other financial-service suppliers would step forward to meet the credit needs of these customers.

This discussion of some of the research of the 1990s indicates that by looking at particular markets where banks are thought to play a special role for lenders as well as by looking beyond the extent to which banks are funding loans on their balance sheets, researchers were able to find evidence that the decline in the share of total nonfinancial-sector debt funded by banks could be misrepresenting the importance of banks in U.S. credit markets. The next two sections examine more recent credit-market trends from both of these perspectives to better illuminate the evolving role of banks in the twenty-first century.

Recent Credit-Market Trends: Who Is Funding Whom?

There is no doubt that the share of nonfinancial-sector debt directly funded by commercial banks declined during the 1980s. More than a decade after that decline, it has become clear that the debt buildup of the 1980s was actually a secular increase in the volume of nonfinancial borrowing associated with economic activity in the U.S. economy, which can be thought of as a permanent increase in the economy's financial capacity

³² After bank data on small loans to businesses and farms were first reported, in 1993, numerous studies looked at the importance of large banks compared with small banks as small-business lenders, and at the implications of industry consolidation for the provision of small-business loans by banks. The findings of studies using data for the mid-1990s suggested that net consolidation activity among larger institutions tended to result in declines in small-business lending as a share of bank assets, whereas mergers among smaller or more focused banks increased the banks' small-business loan shares. Samolyk (1997) and Berger and Udell (1998) discussed some of the small-business loan studies done in the mid-1990s.

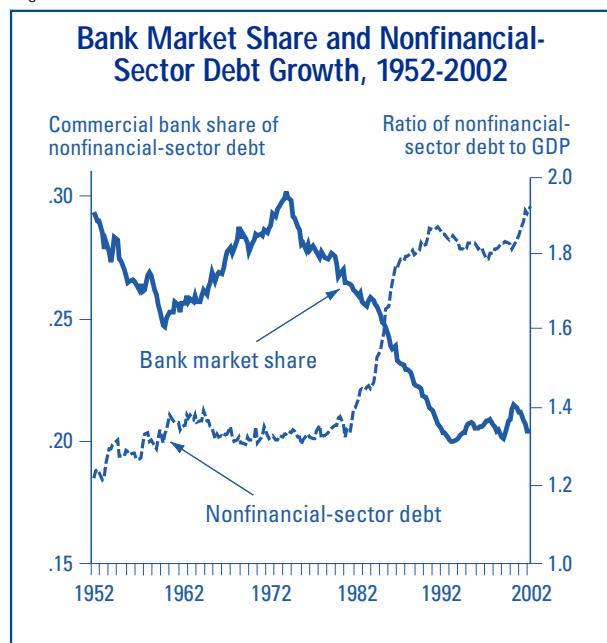
(figure 6). Moreover, this increase in financial capacity was not associated with intermediation funded by banks; hence, banks' share of the pie had declined. However, as the debt capacity of the economy's nonfinancial sector stabilized in the 1990s, so did the market share of commercial banks. During the past decade, the banking sector has rebounded to record profits, and although consolidation has continued, it is occurring in the context of a healthy industry.³³ Here we look at how the players and the instruments used to fund nonfinancial borrowers in U.S. credit markets have evolved during the past decade.

Changed Players and Funding Instruments

The types of credit market instruments (loans and securities) issued by nonfinancial borrowers to obtain funds in formal credit markets have not changed as much as the types of instruments used to fund these credit flows (table 2). Households still obtain credit primarily in the form of home

³³ Consolidation has been related to the relaxation of geographic banking restrictions that limited the extent to which banks could expand their geographic reach (Samolyk and Morgan [forthcoming]).

Figure 6



mortgages and consumer loans (although the former now include home equity lines of credit, which were an innovation of the 1980s). But now asset-backed securities—issued by both private asset-backed-securities (ABS) issuers and federally related mortgage pools—have become an important funding mode. And although non-financial businesses still obtain credit primarily in the form of (a) loans collateralized by business real estate (business mortgages), (b) other (non-mortgage) loans from intermediaries, and (c) corporate securities, business loans are also being securitized, and larger amounts of corporate securities are funded by the issuance of mutual-fund shares. The appendix discusses changes in the composition of investors’ portfolios and the way in which these changes relate to changes in the funding of credit-market debt.

All of these changes are reflected in the growing extent to which the commoditization of credit markets has allowed borrowing by businesses and households to be funded in direct credit markets by securities issues.³⁴ Roughly one-third of total outstanding credit-market debt is now issued by the financial sector to fund other credit-market debt (figure 7). And whereas during the 1980s the growth of securitization largely reflected mortgage funding through federally related mortgage pools, during the past decade, securitization by private ABS issuers has expanded rapidly. FFA data estimate that now almost half of outstanding

³⁴ Debt issued by government-sponsored enterprises (for example, by Federal Home Loan Banks and the Farm Credit System and to fund the on-balance-sheet lending of Fannie Mae and Freddie Mac) has also increased, but (as we discuss below) much of it funds financial sectors, mainly commercial banks and other depository institutions.

Table 2

Credit Markets circa 2000		
Sector	Primary assets held	Financial source of funding
INDIRECT FINANCE		
Commercial banks	U.S. Treasury securities; Other securities (includes asset-backed); Nonmortgage business loans (C&I, Ag); Business mortgages; Home mortgages Consumer credit	Interest-bearing checking accounts Passbook savings accounts MMF accounts; Nondeposit borrowing
Savings institutions	U.S. Treasury securities Other securities (includes asset-backed) Home mortgages Consumer credit	Interest-bearing checking accounts Passbook savings accounts MMF accounts; Nondeposit borrowing
Finance companies	Non-mortgage business loans Consumer loans	Bank loans Commercial paper and Corporate bonds
Insurance companies Pension funds	Corporate bonds State and local government securities	Contingent liabilities to claims holders Defined benefit pension claims
Federally related mortgage pools; ABS issuers	Home mortgages; Consumer credit Business mortgages; Nonmortgage business loans	U.S. agency securities (mortgage pools) Commercial paper and corporate bonds
Money market mutual funds; Mutual funds	U.S. Treasury securities Agency securities (includes asset-backed) Corporate bonds and commercial paper	Mutual fund shares
DIRECT FINANCE		
Sector	Financial assets	Financial liabilities
Investors	Corporate bonds and paper U.S. government and agency securities State and local government securities	

corporate bonds have been issued by financial firms that fund other credit-market debt, with private ABS issuers accounting for a fourth of the corporate bond market (figure 8). The commercial-paper market has always been dominated by financial-sector issues;³⁵ during the past decade, however, private ABS issuers have become the dominant issuers of commercial paper. More than half of outstanding commercial paper (roughly two-thirds of financial issues) is now funding securitized pools of loans—including loans originated by banks (figure 9).

So who is funding whom? The funding of loans through private securities markets and the additional layers involved in modern credit flows have made it more difficult for researchers to track the flow of funds between primary lenders and primary borrowers. However, we use the FFA to examine the extent to which loans to nonfinancial businesses and households are being directly

³⁵ Finance companies have long used commercial paper as a source of financing, and banks began tapping this market for funds to offset disintermediation during periods when market rates rose above the deposit-rate ceilings.

funded by commercial banks and other intermediaries.

Nonfinancial Business-Sector Credit

Borrowing by nonfinancial businesses can be divided into three “markets,” each of which has historically accounted for roughly a third of outstanding nonfinancial-sector business debt: corporate bonds, shorter-term nonmortgage loans and commercial paper, and loans secured by business real estate (business mortgages). Commercial banks have tended to hold only small amounts of corporate bonds, so here we focus on banks’ role in funding shorter-term nonmortgage business borrowing and business mortgages.

Shorter-term business borrowing (depicted in figure 10) is a very heterogeneous credit market. It includes all nonmortgage loans to nonfinancial businesses—from vehicle or equipment loans to business credit lines. It also includes the very liquid commercial-paper issues that fund only the largest corporations. Trends in the composition of shorter-term business borrowing are also most often cited as evidence of the declining impor-

Figure 7

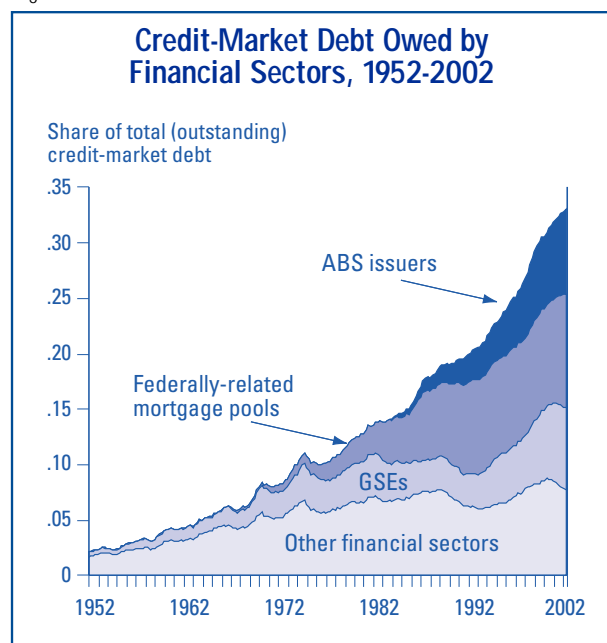
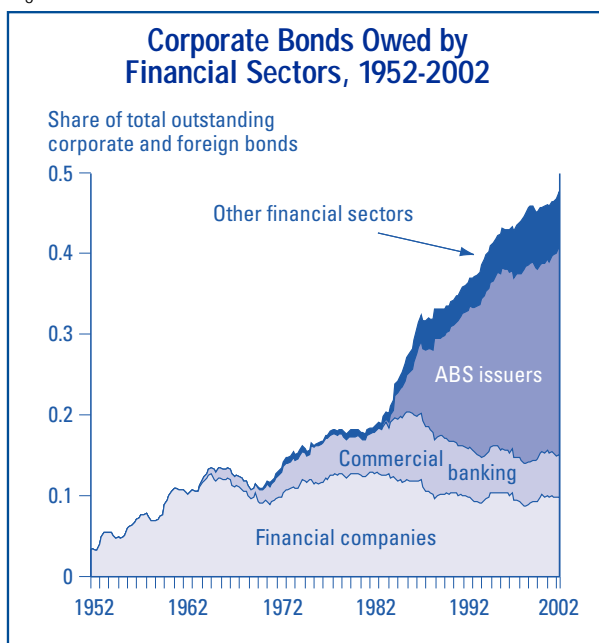


Figure 8



tance of commercial banking (for example, by Herring and Santomero [2000]). The share of shorter-term nonfinancial-sector business credit funded directly by banks declined from more than 75 percent in the early 1970s to just over 50 percent in the early 1990s (it has stabilized during the past decade). Meanwhile the share funded by finance companies has steadily increased, now accounting for 20 percent of shorter-term nonfinancial business-sector credit. ABS issuers have made inroads in funding nonmortgage business loans, although they still account for only 6 percent of this market. Interestingly, commercial paper, one of the widely cited alternatives to bank borrowing, accounts only for roughly 7 percent of this short-term business credit market.

Trends in the business mortgage market—defined to include loans secured by business real estate, including commercial, multifamily residential, and agricultural properties—are depicted in figure 11. Commercial banks now directly fund more than a third of outstanding business mortgages, up from 20 percent two decades ago (and that was before the banking crisis). Private ABS issuers, which did not exist 20 years ago, are now the second-leading business-mortgage funding mode,

accounting for 15 percent of the market.³⁶ Meanwhile, direct funding by life insurance companies and savings institutions has declined significantly.³⁷

Figure 12 depicts commercial bank holdings of the three types of business borrowing (combined) as a share of total outstanding nonfinancial business-sector debt.³⁸ The figure also relates this ratio to the growth of nonfinancial business borrowing over time (measured relative to GDP). As the figure indicates, we estimate that commercial banks fund roughly a third of nonfinancial business-sector debt. And somewhat surprisingly—given discussions about the declining importance

³⁶ The genesis of markets where business loans can be securitized has been linked to the Resolution Trust Corporation's activity in disposing of assets in the wake of savings institution problems.

³⁷ Insurance companies now hold roughly 12 percent of business mortgages, compared with 22 percent 20 years ago and 29 percent 50 years ago. Savings institutions hold less than 8 percent, compared with 22 percent 20 years ago and a peak of 27 percent in the 1970s. The share of business mortgage loans funded directly by nonfinancial borrowers has also declined.

³⁸ Nonfinancial business-sector debt held by commercial banks is estimated to equal the sum of business mortgage loans, bank loans not elsewhere classified, liabilities on banker's acceptances, and the estimated holdings by commercial banks of nonfinancial-sector issues of commercial paper and corporate bonds.

Figure 9

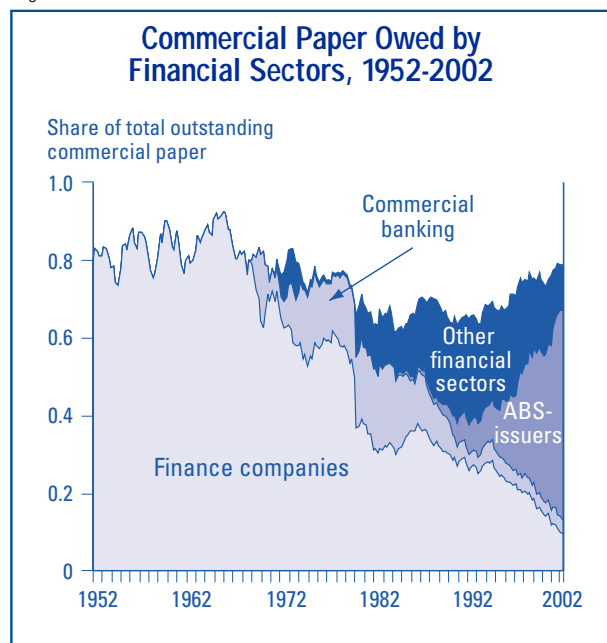
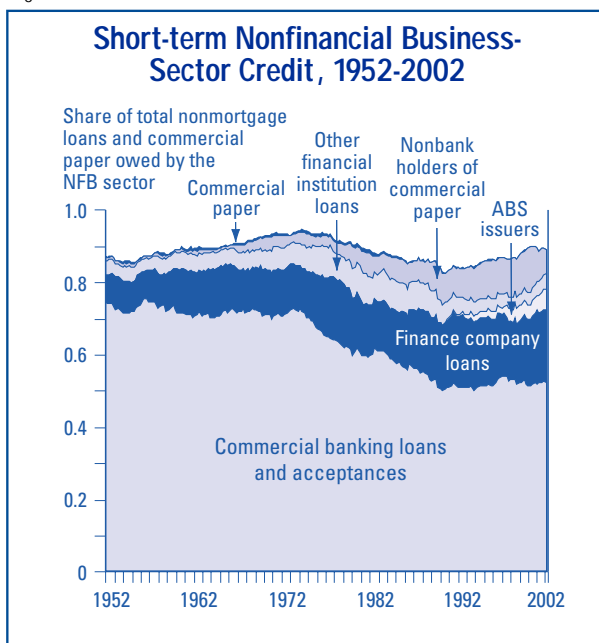


Figure 10



The Future of Banking

of banking for U.S. businesses—this market share has not exhibited a downward trend during the past several decades. But what we do find is a notable shift in the type of business loans being extended by banks, from shorter-term nonmortgage business loans to loan collateralized by business real estate. Thus if one looks only at nonmortgage bank lending, one sees a decline in bank market share, seemingly related to the growth of nonfinancial business-sector debt. However, looking only at this decline is to ignore the other markets where banks fund nonfinancial-business borrowers.

These business-sector trends are broadly consistent with more recent evidence offered in the Federal Reserve Board's Report to the Congress on the Availability of Credit to Small Businesses (2002).³⁹ This report analyzes small-business financing trends using a wide range of data sources and concludes that the patterns of credit use evident in small-business survey data do not indicate a decline in the importance of commercial banks (see also Bitler, Robb, and Wolken [2001]). Commercial banks remain the leading source of credit to small businesses that borrow and the most common source of credit products of

all types.⁴⁰ The report also discusses trends in asset securitization but notes that the securitization of small-business loans has been modest, and it appears unlikely that the securitization of small-business loans will increase significantly in the near term. Thus far, the data do not indicate that asset securitization has yet to become a dominant funding mode for businesses, undoubtedly because business lending is less conducive to standardization than other types of lending.

Household-Sector Credit

Home-mortgage debt has long been the primary type of borrowing for households, and its share of total household-sector debt has risen since the elimination in 1986 of tax deductions for interest paid on nonmortgage credit.⁴¹ By the early 1990s the secondary mortgage market had already made

³⁹ This report, produced every five years pursuant to section 2227 of the Economic Growth and Regulatory Paperwork Reduction Act of 1996, can be found on the Internet at www.federalreserve.gov/boarddocs/rptcongress/sbfreport2002.pdf.

⁴⁰ The Survey of Small Business Finances (SSBF) asks respondents to discuss specific types of loans, including vehicle loans, equipment loans, lines of credit, leases, and mortgages.

⁴¹ See Canner, Durkin, and Luckett (1998).

Figure 11

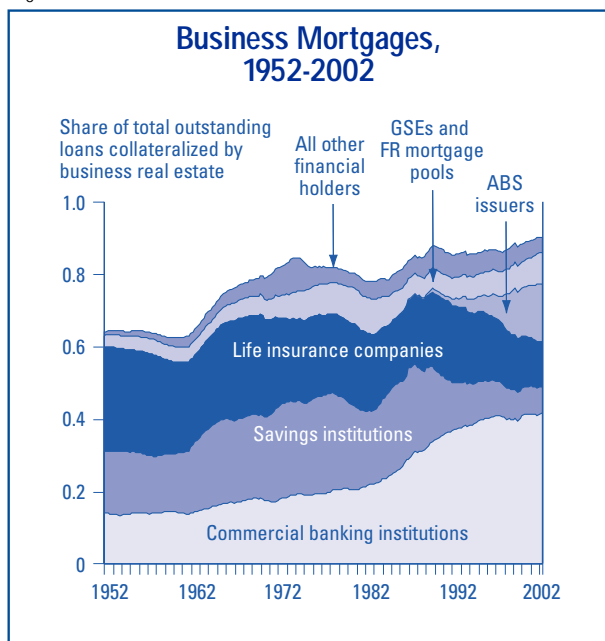
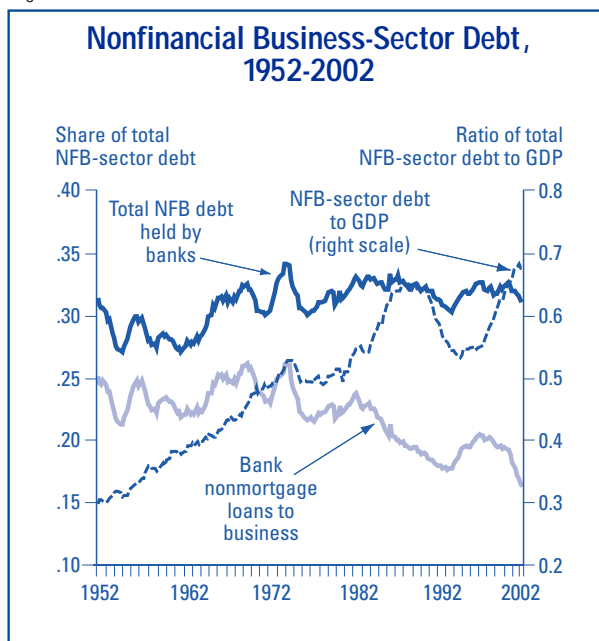


Figure 12



enormous inroads into the funding of home mortgages, and the past decade has seen further increases in the market share held by federally related mortgage pools, government-sponsored enterprises (GSEs), and private issuers of asset-backed securities (see figure 13). GSEs and federally related mortgage pools now fund close to half of outstanding home-mortgage debt, up from 35 percent a decade ago and from a mere 10 percent in 1983. Commercial banks' holdings of home-mortgage debt have been remarkably stable, roughly equal (at 18 percent now) to the level they were 20 years ago. Clearly, this is the market that manifests the rise and fall of savings institutions, whose share of the home-mortgage market has declined from more than 50 percent 20 years ago to only 13 percent today. Some of this decline in market share (and the stability of commercial banking's share) reflects the absorption of savings institutions into the commercial-banking sector through mergers and charter conversions. Life insurance companies, which had significant home-mortgage holdings in the 1950s and 1960s, directly fund almost no home mortgages today.⁴²

⁴²Home-mortgage lending has always been mainly funded by financial intermediaries, and the share of such lending held by financial firms now stands at a 50-year high of 96 percent.

Of course, commercial banks, savings institutions, and insurance companies can—and do—fund the home-mortgage market indirectly when they invest in the securities issued in the context of secondary market activity. However, we net these indirect holdings out of our market-share measures to avoid overstating the flow of credit to home-mortgage borrowers.

In terms of consumer credit, commercial banking's share of funding has not been so stable (figure 14). From the 1950s through the 1970s, an “institutionalization” of the consumer-credit market took place, referring to the increasing extent to which consumer credit was funded through intermediaries (depository institutions and finance companies) rather than directly by nonfinancial corporations (e.g., manufacturing and retail firms). In its infancy, asset securitization by private ABS issuers represented a shift—rather than an increase—in the intermediation of consumer credit. In the late 1980s and early 1990s, the shift came at the expense of savings institutions and finance companies rather than commercial banks or credit unions. Indeed, as recently as 1994, close to half of outstanding consumer credit was directly funded by commercial banks, and

Figure 13

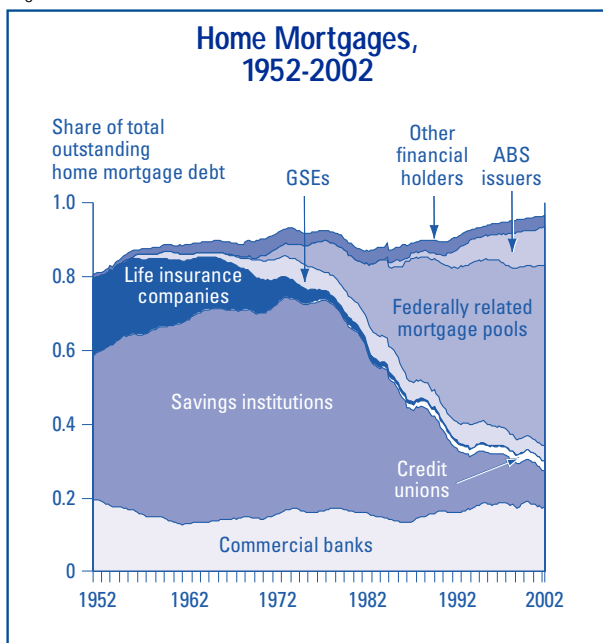
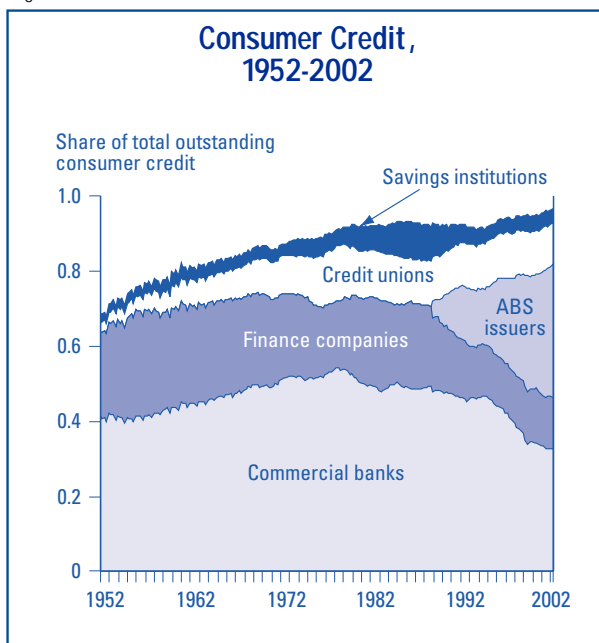


Figure 14



analysts speculated about the long-run role of asset securitization as a funding mode for consumer credit. A decade later, the speculations are answered. The funding of consumer credit through financial intermediation stands at an all-time high of 97 percent, and securitized pools now finance a third of outstanding consumer credit. Commercial bank holdings of consumer credit have declined to roughly a third of the market. Finance companies, savings institutions, and credit unions account for the remainder. In the evolving consumer-credit market, credit unions appear to have fared the best among traditional intermediaries in terms of maintaining market share.

What then do the FFA data indicate about trends in the overall importance of commercial banks in household-sector credit markets? Figure 15 relates commercial banking's market share of home-mortgage and consumer debt to the overall growth of these types of credit markets (the latter measured relative to GDP). Five decades of FFA data indicate that commercial banking's share of home-mortgage and consumer credit has tended to trend downward when borrowing capacity in these markets has been expanding (again, measured relative to GDP). Thus (as with broader

nonfinancial-sector debt) although commercial bank funding of home mortgages and consumer credit has grown, the overall flow of credit to households through these markets has expanded by much more.

And Banks' Competition?

Our analysis of the markets where households and businesses borrow does not seem to validate the dire predictions suggested by some analyses. Although we certainly find that commercial banks' on-balance-sheet market share is lower than it was 20 years ago, the decline we are measuring in the role of banks seems to be smaller than the declines advanced by others. Here we reconcile our findings with the findings of those who suggest a more serious decline in the importance of banks; we then look at the competition faced by commercial banks.

We find less in the way of a decline than other researchers for two reasons. First, when we examine the role of commercial banks in channeling credit to nonfinancial-sector borrowers, we net out credit-market debt issued to fund more debt. Netting out financial-sector debt (figure 16) yields generally stable market shares since the

Figure 15

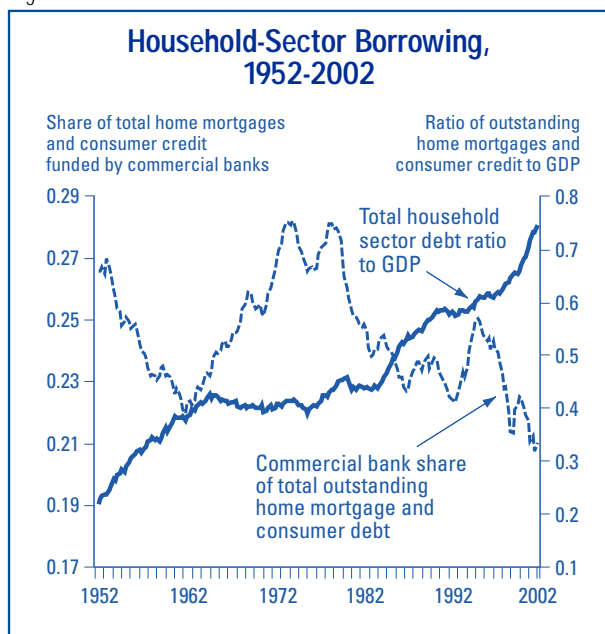
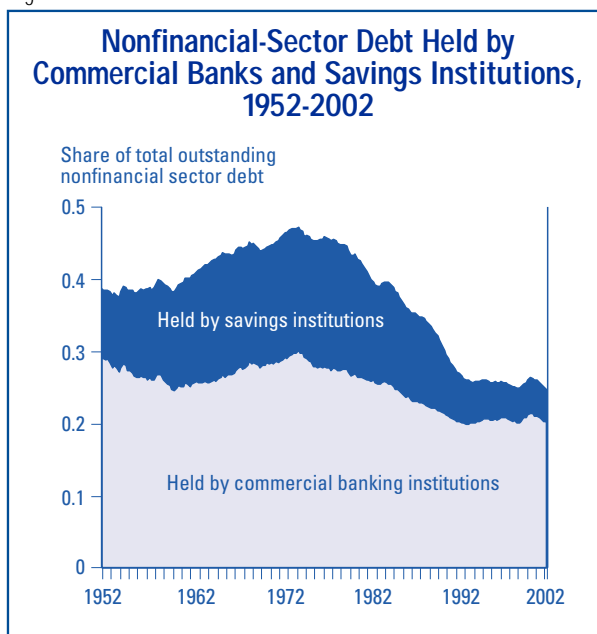


Figure 16



early 1990s, while market-share measures that are based on total debt show further declines through 2002 (figure 17).⁴³ This indicates that the growing volume of credit-market debt being issued by financial firms does not entirely reflect funds being issued to displace lending by other financial-sector players. Indeed as we shall see, some financial-sector issues of credit-market debt (notably those of Federal Home Loan Banks) are channeled as sources of funding to other financial firms—including banks.

A second reason we find less of a decline in banks' market share than other researchers do is that we focus on commercial banking rather than on banking in the sense of all depository institutions. Savings institutions historically have been quite different from commercial banks and certainly have had distinctly different experiences in the nation's evolving financial environment.⁴⁴

What, then, can we say about the overall market-share trends for the competition? Figure 18 illustrates the share of nonfinancial-sector debt directly funded by sectors commonly viewed as the strongest competition for banks in the new financial world.⁴⁵ Finance companies, GSEs, and

asset-backed-securities issuers largely fund their intermediation by issuing securities in direct credit markets. Mutual funds issue mutual-fund shares that may be held directly by individuals or indirectly as assets by defined-contribution pension plans. The picture displays some intriguing results.

Not so surprisingly, we find that significant competition has indeed come from asset securitization, both federally related and private. The evolution of home-mortgage financing in the direction of securitization suggests that large segments of the mortgage market are better suited to funding by the issue of long-term debt. Certainly this funding mode reduces the interest-rate risks

⁴³ Netting out holdings of financial-sector debt for commercial banking and other financial sectors reported in the FFA requires detailed analysis of each sector's financial asset holdings. When detail is not reported in the FFA, specifically for corporate bonds and commercial-paper holdings, we estimate holdings of nonfinancial-sector issues using patterns evident for these markets in the FFA.

⁴⁴ This is particularly true now that asset securitization has become the dominant funding mode for home mortgages—traditionally the primary asset held by savings institutions.

⁴⁵ For some of these sectors, the flow of funds allows one to directly identify holdings of nonfinancial sector debt. For others, such as the sectors that hold corporate bonds and commercial paper, we used the patterns evident in these markets to impute holdings owed by nonfinancial borrowers.

Figure 17

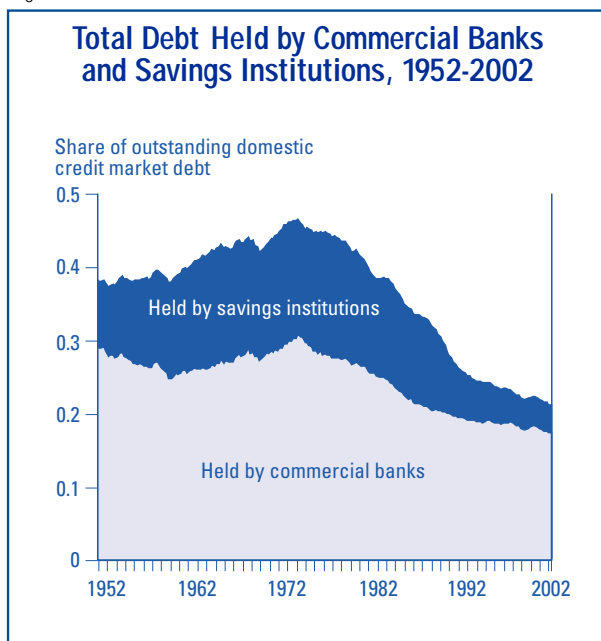
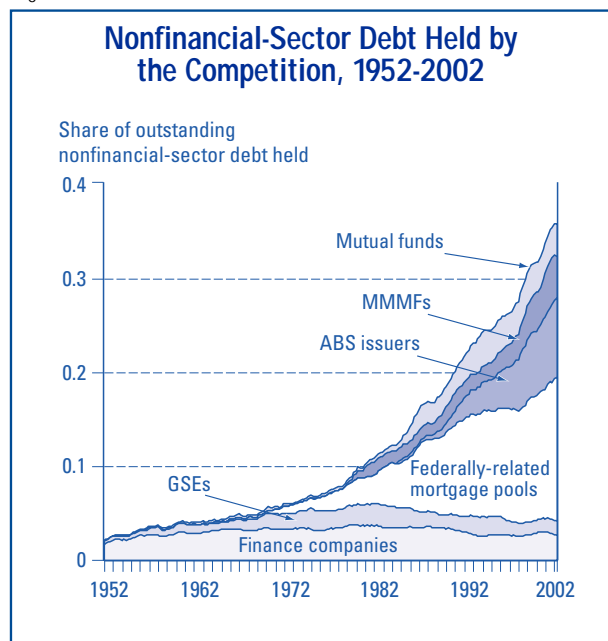


Figure 18



associated with funding long-term mortgages by issuing deposits. As we argue in the appendix, mortgage securitization is better suited to attracting long-term investment funds associated with the accumulation of pension wealth. At the same time, the evolution of home-mortgage funding has basically reduced the role of S&Ls (and insurance companies) in funding home mortgages.

A somewhat more curious source of competition for commercial banking appears to be securitization by private ABS issuers. This mode of funding has affected the nonmortgage markets where households and businesses borrow—most particularly, consumer-credit markets. However, as we discuss in the next section, there is some question as to whether ABS issuers are competitors of banks or merely an alternative mode of funding for banks (particularly large ones).

A third sector that is growing its market share as a funder of the nonfinancial sector is the mutual-fund industry. Of course, since mutual funds hold securities rather than loans, their growth represents less direct competition than the growth of federally related mortgage pools and ABS issuers for the types of lending that make banks special—loans to households and businesses. Indeed, as we show in the appendix, the growth of mutual funds reflects a shift on the part of investors from holding securities directly toward holding them through mutual funds to achieve diversification of risks.

In recent decades two other sectors—ones that are often brought up in discussions of the growing competition faced by banks—have not measurably increased the share of nonfinancial-sector debt they fund. These sectors are finance companies and GSEs. Finance companies may also be securitizing some of the more standardized types of loans they make to households and businesses. GSEs' share of *total* credit-market debt has risen (see figure 7), but as noted earlier, much of this debt funds intermediaries—including commercial banks and savings institutions—rather than nonfinancial borrowers.

Alternative Measures of Bank Market Share

As discussed above, a decade ago, differences in what constitutes banking services led to different assessments of the prospect for banks. Researchers who tended to define banking services in terms of what one sees on bank balance sheets (deposit taking, lending, and investments in securities) tended to be more pessimistic about the future of banking.⁴⁶ Alternatively, researchers who tended to look beyond traditional banking activities—at an extreme, broadly defining banking as including the “measuring, managing, and accepting of risk”—argued that banks were not becoming less important.⁴⁷ From the latter perspective, new services provided by banks—whether the selling of mutual-fund shares to investors or the origination, sale, and servicing of loans funded by securitizations—are merely banking in different forms.

In this section we broaden our perspective and ask how else we might measure the importance of banks in the U.S. financial sector. The growth in our economy's debt capacity that has been funded through direct credit markets rather than through traditional intermediation does not mean that intermediaries—particularly banks—do not provide important services that facilitate funding in securities markets. Here, therefore, we revisit the notion that looking beyond what is measured on bank balance sheets may yield a different view of the evolving role of commercial banks in facilitating credit flows.

⁴⁶ An example of a relatively recent paper arguing that banks have become less special is Herring and Santomero (2000). These authors document the decline in banks' funding of credit-card receivables, the rise in banks' share of mortgages that are securitized, and the erosion of banks' share of the short-term commercial lending market. They also argue that banks are losing ground on the liability side of their balance sheets, as demographic trends and technological advances on the payments side make mutual funds an increasingly attractive alternative to bank deposits.

⁴⁷ This phrase was used by Greenspan (1994) in addressing the conference where Boyd and Gertler presented their work on alternative measures of bank market share.

As credit-related services have become unbundled, layers of transactions have been added to the intermediation process, and each layer (albeit just a piece of the overall services associated with a given flow of funds) adds value. Banks now provide services in originating, servicing, or enhancing the creditworthiness of credit flows that end up being funded elsewhere. But even though the asset is not booked on a bank's balance sheet, the provision of any and all credit-related services should be reflected in the income of the providers. Accordingly, here we examine income-related measures of bank activity, which should reflect the flow of services provided over time (since income is generated by the production of goods and services in our economy). We examine data on income and profitability. We also look at estimates of output, employment, and annual compensation in the banking sector compared with other sectors in the economy.

Income and Profitability

The unbundling of credit-related services (as well as the concomitant provision of off-balance-sheet financial services that generate income) suggests that income-based measures of market share may in fact be superior to balance-sheet-based constructs. Ideally one would like to measure the income flows associated with the provision of particular types of services (origination, servicing, packaging and funding, credit enhancing) in particular types of credit markets (the home-mortgage, consumer-credit, or business-credit markets). Unfortunately, comprehensive income-based equivalents of the FFA do not exist. Hence we must piece together evidence about banks' provision of credit-related services both on and off their balance sheets and must infer the meaning of such evidence for the evolving importance of commercial banking in the U.S. financial sector.

In both household- and business-sector credit markets, the off-balance-sheet roles of commercial banks are increasingly important. In home-mortgage and consumer-credit markets, bank off-balance-sheet activities tend to be related to the

loan-securitization process. More than half of home mortgages and an increasing share of consumer debt are funded through asset-backed securities, and commercial banks (particularly large ones) play growing off-balance-sheet roles in these markets.

The Survey of Consumer Finances (SCF)—which tends to indicate where households obtain credit, not necessarily where the credit is funded—does not indicate a decline in the share of debt that households reported *obtaining* from commercial banks since 1989 (table 3).⁴⁸ This contrasts with the market-share trends in *funding* we found using FFA data.

⁴⁸ The SCF data do indicate a dramatic decline in the volume of household credit obtained from savings institutions. Ascorbi and Kennickell (2003) report trends evident from the 2001 SCF.

Table 3

The Survey of Consumer Finances Public Data					
Percentage of debt of all families, distributed by type of lending institution					
1989, 1992, 1995, 1998, and 2001 surveys					
Type of institution	1989	1992	1995	1998	2001
Commercial bank	28.1	33.1	35.0	32.8	34.1
Savings and loan or savings bank	26.0	16.9	10.8	9.7	6.2
Credit union	3.8	4.0	4.5	4.2	5.5
Finance or loan company	3.7	3.2	3.2	4.1	4.3
Brokerage	2.5	3.2	1.9	3.8	3.1
Mortgage or real estate lender	20.8	27.2	32.7	35.5	37.9
Individual lender	7.8	4.3	5.1	3.4	2.0
Other nonfinancial	1.6	1.6	0.8	1.4	1.4
Government	2.0	1.9	1.2	0.6	1.1
Credit card and store card	2.8	3.3	3.9	3.9	3.7
Pension account	0.1	0.1	0.2	0.4	0.3
Other	0.9	1.1	0.7	0.3	0.4
TOTAL*	100.0	100.0	100.0	100.0	100.0

*Note: Totals may not sum to 100 due to rounding.
Source: Federal Reserve Board.

In terms of consumer credit, the participation of commercial banks (particularly large ones) in the securitization process tends to involve more than loan origination. For credit-card securitizations, large commercial banks originate, service, and monitor the accounts. Thus, they have the relationship with the borrower. Through a legally separate special-purpose-entity they channel their receivables into a package that can be funded by investors—including mutual and pension funds—that are willing to hold asset-backed securities. The originating institution manages the assets being securitized to maintain the credit quality of the pool and often holds a tranche to further enhance the pool's quality. Finally, the bank that is sponsoring the pool generally receives any residual income earned on these assets in the pool, beyond what is promised to the investors buying the ABS-issuer's securities. What credit-related services is the bank not performing in this process? One could, therefore, argue that credit-card securitizations should be included dollar for dollar when the share of commercial banks in consumer-credit markets is measured, since this process is effectively a means of funding the loans by the issuance of secured debt (rather than deposits).

As for business credit markets, although securitization plays less of a role than it does in household-sector credit markets, commercial banks have long played a role in providing the liquidity and credit facilities that support the placement of debt in direct credit markets—including debt issued by financial firms. This activity was highlighted by researchers a decade ago.⁴⁹ Thus income for services not reflected on banks' balance sheets extends beyond income connected with loans sold into securitized loan pools.

Noninterest income as a share of earnings has received considerable attention from analysts during the past two decades, for the share of net operating revenue from noninterest income has more than doubled since 1980 (figure 19). Until recently, however, it has been difficult to identify the extent to which the growth in noninterest income has been related to such off-balance-sheet activities as asset securitization. Before 2001,

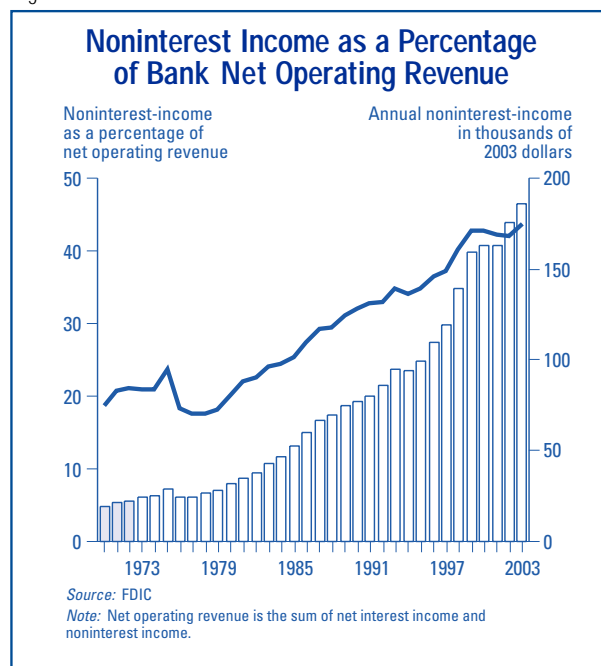
bank Call Reports asked for detail only on three categories of income: service charges on deposit accounts, fiduciary (trust) income, and revenues from trading operations. All other noninterest income was reported in two residual categories: Other Fee Income and All Other Noninterest Income. Thus, although the relative growth of bank noninterest income was driven by these two residual categories, it was impossible to discern the nature of the activities associated with this growth in income. Since the beginning of 2001, however, commercial banks (and savings institutions) have reported greater detail about noninterest income.⁵⁰

As summarized in table 4, these relatively new data indicate some interesting facts about the noninterest revenue and the nature of bank off-

⁴⁹ Boyd and Gertler (1994b); D'Arista and Schlesinger (1994); Avery and Berger (1991a), and (1991b).

⁵⁰ As reported by Waldrop (2002), "The new report format introduced in the first quarter of 2001 still includes fiduciary income, deposit service charges, and trading revenues, but it now also breaks out income from investment banking services, revenues from venture capital investments, servicing fees, income from asset securitization activities, insurance commissions and fees, and proceeds from sales of loans, other real estate, and other assets."

Figure 19



balance-sheet activities.⁵¹ About 34 percent of noninterest income comes from what can be thought of as traditional banking activities. The traditional sources include deposit account fees, trust activities, and asset sales not associated with securitization. The large number of institutions reporting and the relatively low concentrations of income earned by the five largest income earners in these categories suggest that these sources of income are used fairly broadly.

Roughly 15 percent of noninterest income in 2001 came from sources formerly associated with nonbank firms. The activities not generally thought of as traditional banking include trading, investment banking (fees and commissions from investment banking, advisory, brokerage, and underwriting services), and insurance services. Of these, income from trading activities is con-

centrated among a relatively small number of institutions, but a wide range of banks earn at least some income by providing investment banking and insurance services.

In terms of noninterest income associated with the commoditization of credit, about 18 percent of noninterest income reported by banks in 2001 reflected fees for servicing assets funded elsewhere and securitization income (net gains on sales of securitized assets plus nonservicing fees). As Waldrop (2002) pointed out, “The data show that securitization income (net gains on sales of securitized assets plus non-servicing fees), at \$16.4 bil-

⁵¹ Table 4, based on data reported by Waldrop (2002), shows the amount of noninterest income in each component category, as well as the number of banks reporting non-zero amounts in each category. It also shows the share of income in each category represented by the combined totals of the five largest amounts reported, to indicate how highly concentrated each underlying activity was within the banking industry during 2001.

Table 4

Noninterest Income of Insured Commercial Banks, 2001 (Amounts in \$ Thousands)				
Noninterest Income Category	Full Year Amount	Percent of Total	No. of Banks Reporting	Combined Share of 5 Largest Reported Amounts
Traditional sources of bank noninterest income				
Net gains/losses on sales of other assets ¹	2,249,208	1.40	2,321	84.60%
Net gains/losses on loan sales	4,642,565	3.00	1,739	47.50%
Income from fiduciary (trust) activities	20,751,226	13.20	1,668	39.40%
Service charge on deposit accounts	26,472,609	16.80	7,909	33.90%
Trading, investment banking, and insurance				
Trading revenues	12,524,834	8.00	175	82.60%
Investment banking and other fees	9,096,981	5.80	2,178	55.80%
Venture capital revenue	-740,222	-0.50	61	N/M
Insurance commissions and fees	2,874,938	1.80	4,063	38.40%
Servicing and securitizing loans				
Servicing fees	11,568,730	7.40	1,626	41.50%
Securitization income	16,349,975	10.40	100	64.00%
Not identified				
Other noninterest income	51,335,770	32.70	7,983	21.20%
Total noninterest income	157,171,912		8,050	
<i>Source: Bank Call Reports (FDIC Research Information System).</i>				
¹ Excludes gains/losses on sales of OREO, which accounted for negligible amount of income in 2001.				

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lion for the year, represented the largest amount of any of the new categories. The next-highest category was servicing fees, at \$11.6 billion.”

Also included in the residual category of “All Other Noninterest income” is income from unconsolidated subsidiaries, data processing services, ATM usage fees charged to depositors from other institutions, and income from other services (notably the provision of liquidity and credit facilities). This residual category is still the largest component of total noninterest income. At \$51.3 billion in 2001, it represented 33 percent of commercial banks’ noninterest income.

Income is obviously closely related to profitability, and in this regard banking has been holding its own. The data on profits, like the data presented below on output, employment, and compensation, are from the Bureau of Economic Analysis (BEA), which constructs estimates of these measures for broad sectors of the U.S. economy, including financial sectors. One limitation of the BEA data series is that the classification of “credit agencies” was changed in 1987. Through 1987, commercial banking was specifically broken out as a component of credit agencies; other lenders (such as savings institutions and finance companies) were aggregated simply as “other credit agencies.” With the elimination of many of the differences between commercial banks and savings institutions, industrial classifications for credit agencies were redefined as “depository institutions” and “other credit agencies.” Thus, we cannot directly observe what is happening to commercial banking’s share of economic activity, but we can draw some inferences based on what we observe for all depository institutions and on the relative shrinkage of the savings institution industry since 1987. A second limitation of these data is that they do not contain the same level of detail as the FFA. Hence we cannot look at trends for banking vis-à-vis particular types of other financial-service providers.

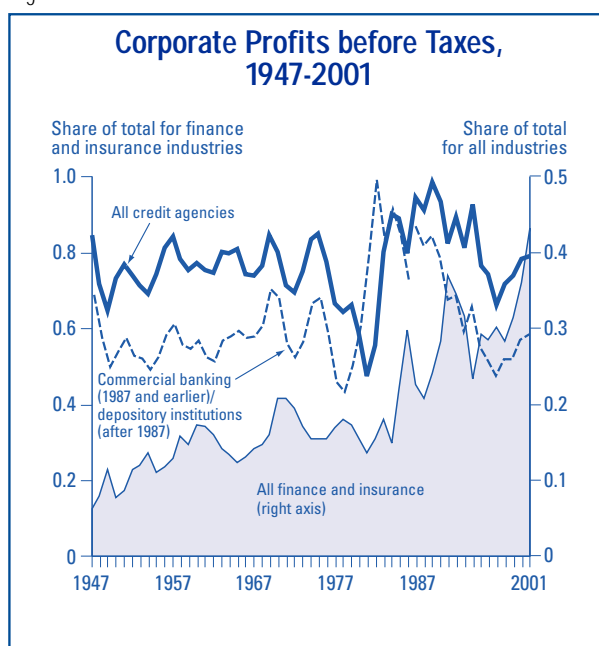
Corporate profits for finance and insurance industries have been rising as a share of total corporate profits, particularly since the mid-1980s. Although the data after 1987 are for all deposito-

ry institutions, the broad trends do not suggest an industry in decline (see figure 20). While banks were returning to record-setting earnings in the 1990s, so were other financial-service providers (hence the decline in depository institutions’ share of finance and insurance corporate profits), but the profitability of the banking sector has outpaced that of other financial sectors during the past few years.

To deal with the lack of detail in the BEA data on the performance of other financial-service providers, FDIC analysts have compiled and tracked profitability data available for publicly traded U.S. financial corporations. Because large conglomerates are involved, classifying financial enterprises into a single financial-service category is not always easy. In addition, like the BEA data, this information classifies banking to include both commercial banks and savings institutions. These estimates yield some very interesting patterns (figure 21).

First, the category of credit providers accounts for roughly three-fourths of the net income of financial corporations. And although this finding no doubt reflects declines in stock market valuations, this share of profits is comparable to the share in

Figure 20



1984—before the growth of U.S. financial capacity and the attendant decline in the share of non-financial-sector debt directly funded by banks. Second, profitability reflects the amount of intermediation services provided, not just the volume of funds brokered to investors. From this perspective, it is not surprising that government-sponsored enterprises have a relatively small share of profits compared with the volume of credit they channel, both directly and through asset securitization. Finally and most pertinent to the point of this paper, the banking industry (here, however, defined to include savings institutions as well as commercial banks) appears to have maintained its market share quite well in terms of profitability, rebounding from the problems encountered during the 1980s and early 1990s.

Output, Employment, and Compensation

The other economic-activity-based measures of bank market share that may tell us something about the importance of commercial banking in U.S. credit markets include output, employment, and compensation. These are useful because they indicate the resources allocated to the provision of services by banks compared with the resources

used in the production of goods and services by other sectors.

Figure 22 illustrates the contribution of the finance and insurance industries to GDP (it also illustrates credit agencies' share of the total output of the finance and insurance sectors). Consistent with the growth of credit-market debt in the U.S. economy, financial-service firms account for a growing share of aggregate output (except for an increase during the debt buildup of the 1980s, credit agencies' share of financial- and insurance-sector output has been remarkably stable). During the past decade, the estimated output of depository institutions has been growing more slowly than the estimated output of other credit providers (i.e., depository institutions' share of the GDP of finance and insurance industries has been declining), but this trend may reflect the continuing contraction of the savings-institution industry.

Figure 23 depicts employment trends measured in terms of full-time-equivalent (FTE) employment. Until the mid-1980s, employment in the finance and insurance industries grew as a share of total employment in the U.S. economy; since then, employment growth in finance and insurance industries has lagged employment growth in other

Figure 21

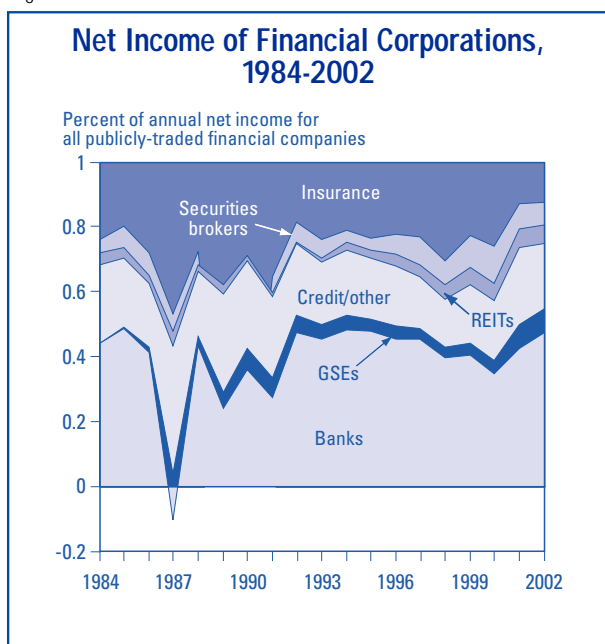
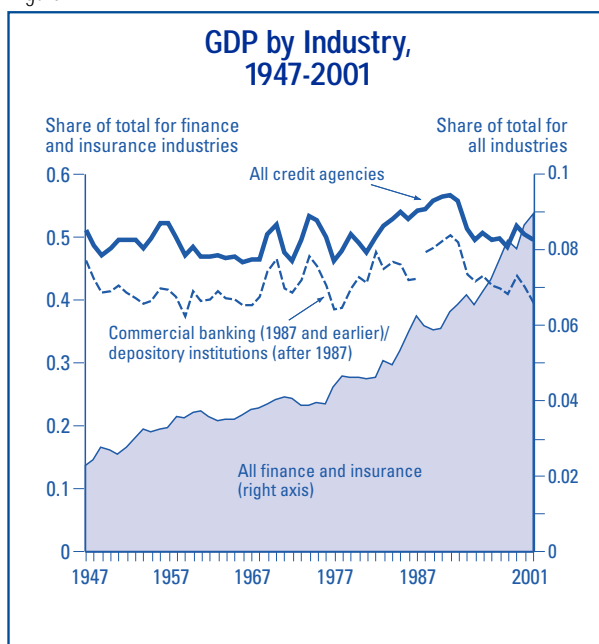


Figure 22



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industries. This pattern probably reflects the application of computer technologies in financial-service industries, technologies that have increased the productivity per worker and therefore reduced the person hours needed to produce a given level of financial services. Commercial banking is an important driver in these trends. Until the 1980s, commercial banking's share of total employment in our economy was rising (as was employment by other credit agencies, which included savings institutions). The share of total employment in commercial banking flattened out in the early 1980s, when the use of ATMs became widespread, and the data for all depository institutions indicate a long-term decline in these institutions' FTE employment share during the past 15 years. Although employment growth for insurance industries has also been slowing, banking's

declining share of FTE employment has been more pronounced.

Similarly, data on total compensation (see figure 24) indicate that although compensation in the finance and insurance industries has been steadily increasing as a share of total compensation paid in the U.S. economy, this increase has not been fueled by the growth of compensation in the banking sector. Since 1987, compensation paid by depository institutions has declined as a share of the total financial-sector pie. Nevertheless, because both employment and compensation trends reflect dramatic changes in the technologies used to deliver financial services, they are likely to overstate declines in the contribution of credit providers to economic activity.

Figure 23

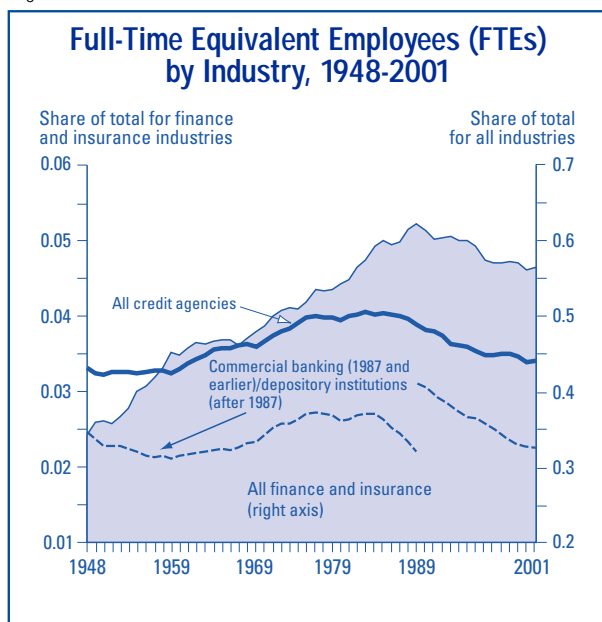
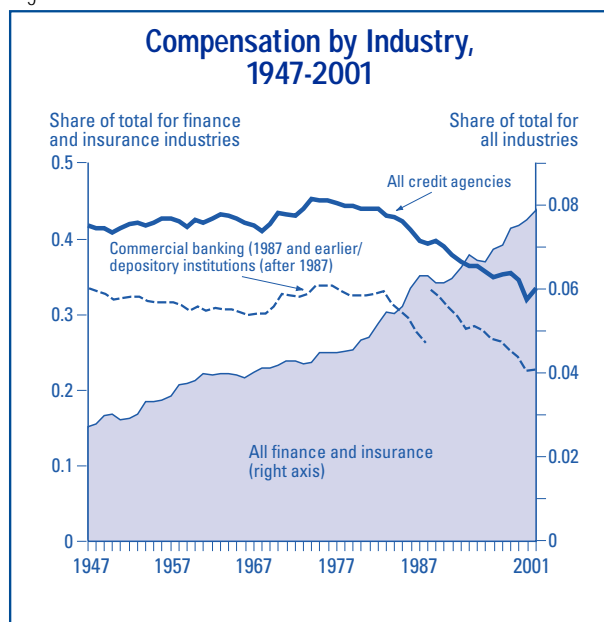


Figure 24



Conclusions

This paper assesses concerns that banks are becoming less important in U.S. credit markets, using available data to quantify the importance of commercial banks as credit providers—to quantify their “market share.” Certainly as the debt capacity of the U.S. economy expanded in the 1980s, the share of nonfinancial-sector debt that was directly funded by banks declined. This decline was associated with a dramatic increase in the extent to which lending to households and businesses became securitized—that is, standardized, pooled, and funded by the issue of securities. The shift away from traditional intermediation towards asset securitization reflects not only changing credit technologies but also the activity of government-sponsored enterprises. The shift towards funding credit through securities markets also reflects fundamental changes in how individuals accumulate assets, due to changes in technology, pension regulations, and demographics.

Long-term instruments such as home mortgages are arguably better suited to securitization as a funding mode because of the maturity mismatch inherent in depository institution funding. However, it is harder to make the same case for the private securitization of some other types of loans—for example, credit card receivables. Nevertheless, banks play a prominent role in this type of securitization activity, so this may be a way for banks to fund loans effectively by issuing secured debt while they continue to be involved in all other aspects of the provision of credit (including the relationship with the customer and the responsibility for maintaining the quality of the pool of loans being funded). This alternative funding mode has allowed banks to make more loans than they would have been able to if they had relied on deposits alone as a funding source.

Thus, although commercial banking’s on-balance-sheet activity has declined as a piece of the credit-market pie, the industry’s off-balance-sheet activities are a growing source of income. Hence the ultimate finding of this study must be that banking is evolving but does not appear to be

declining. Even according to some fairly traditional measures, the commercial banking industry remains remarkably important in funding credit flows in the United States—especially credit flows to nonfinancial businesses.

What, then, can we say about the future of banking? Although the extent to which commercial banks directly fund nonfinancial sectors in our economy has been stable since 1993, such stability does not preclude future declines. Future increases in the economy’s debt capacity are not likely to take the traditional form of intermediation. Thus, it will continue to be important for researchers to study the evolving roles banks play in our financial sector, the risks these roles pose for the industry, and the implications of these evolving roles for broader financial stability. For example, policy makers very much need evidence about the risks inherent in the unbundling and repackaging of credit and about the implications of these risks.

The secular shift by banks toward funding business lending that is collateralized by real estate represents a shift to a type of lending that has been associated with localized banking-sector problems. This association is likely to be most problematic for community banks, which are more geographically focused in their activities, than for larger banking companies operating a wide range of profit centers over broader geographic areas. In general, off-balance-sheet activities imply an ever more critical role for large banking organizations.

The services that commercial banks provide in enhancing the liquidity and credit quality of claims funded elsewhere undoubtedly reflect the industry’s unique status in our financial sector. The role of banks in making credit marketable indicates that commercial banking remains a critical force in the modern flow of funds that has contributed to the broader availability of credit in the U.S. economy.

APPENDIX: Investor Portfolio Trends

On the asset side of nonfinancial-sector balance sheets there have also been fundamental changes in the way individuals hold financial assets, particularly as changes in pension regulations and the availability of mutual funds took hold during the 1980s. In addition, changes in mechanisms used to conduct transactions and make payments over the past several decades appear to have reduced the extent to which individuals have to hold liquid assets as a share of their financial portfolios for transactions purposes.⁵² Here we discuss the extent to which these trends have made it easier for the growing volume of securities issued by financial-sector firms to be absorbed.

The growth of the mutual-fund industry can be thought of as a commoditization of investment opportunities in direct credit (and equity) markets. By pooling many securities, a mutual fund can reduce idiosyncratic risks and generate more-predictable risk, return, and liquidity, compared with any given securities in the pool. Thus by choosing particular types of securities, mutual funds can target particular characteristics for investors in terms of risk, return, and even the social or ecological consciousness of the underlying firms. Not only do personal investors hold these funds, but institutional investors—particularly life insurance and pension funds—also hold mutual-fund shares indirectly for their claimants.

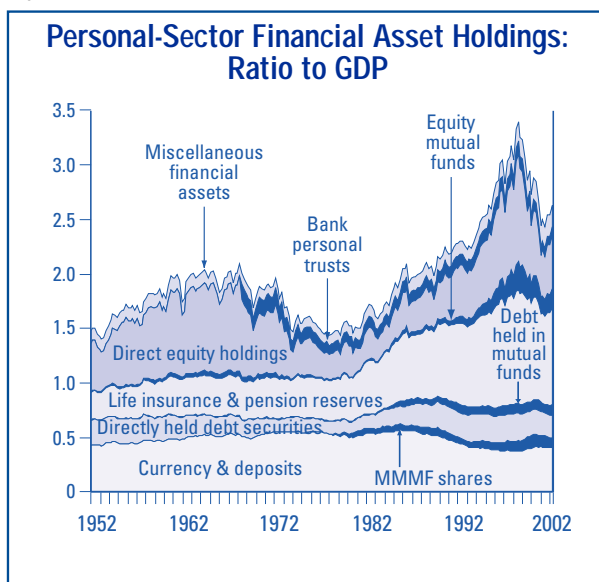
Figure A.1 illustrates trends in the financial assets held by the personal sector. Because of inherently different risks and returns, we distinguish between holdings of debt and holdings of equity mutual funds by the personal-sector portfolio. The resulting picture shows a dramatic increase in individu-

⁵² For example, the increased use of credit cards allow individuals to actually pay for the transaction made during a month at a single point in time. Thus, individuals can transfer funds to their transactions accounts when they need to pay their credit card bills. At other points in times they may hold relatively little “money.” Payment system changes are discussed in *The Effect on U.S. Banking of Payment System Changes* by Neil B. Murphy of Virginia Commonwealth University, which follows this article.

als’ accumulation of financial assets, an increase associated with the growth of pension wealth and increases in equities values (until the past few years, at least). The extent to which individuals’ direct holding of mutual funds has facilitated the absorption of credit-market debt has been surprisingly modest. And although money-market mutual funds (MMMFs) have certainly displaced deposits somewhat, the overall level of transactions accounts held by individuals (defined in the Federal Reserve Board of Governor’s Survey of Consumer Finances to include bank accounts and nonbank transactions accounts, such as MMMFs) as a share of GDP has remained fairly stable over time. However deposits are now a smaller share of the total portfolio of financial assets held by individuals than thirty years ago. The growth of insurance and pension reserves as a component of personal financial-asset holdings has been the most prominent trend during the past few decades.

In the early 1950s, roughly half of the personal sector’s financial portfolio consisted of claims on traditional intermediaries, that is, life insurance companies, pension funds, and depository institutions (figure A.2). And as noted, these intermediaries mainly held debt issued by nonfi-

Figure A.1



financial-sector borrowers; thus, intermediation tended to involve a single layer: indirect liabilities held by individuals were used mainly to fund non-financial borrowers directly.⁵³ The other half of the personal-sector portfolio was in the form of directly held securities (i.e., stocks and bonds). Importantly, equities tended to be held directly by individuals—most likely individuals with greater financial resources.

The next few decades saw a shift in the personal-sector portfolio toward the indirect liabilities issued by intermediaries, including commercial banks and savings institutions. By the mid-1970s, direct holdings of securities had fallen to around a third of the personal sector's portfolio (we include custodial bank personal trusts, first reported in the FFA in 1969, in this share). Mutual funds still accounted for only 1 percent of the personal sector's portfolio, and money-market mutual funds did not yet exist. Traditional intermediation had increased its share of the personal-sector portfolio to almost 60 percent (figure A.3), and the market share allocated to deposits (and currency) peaked at this time at 35 percent. However, an interesting trend was under way as pension and insurance sectors were increasing their holdings of equities (not depicted in the figures). Thus, the decline

in direct equities held by individuals was offset by increases in equity investments by these intermediaries.⁵⁴

In recent decades, trends evident in the 1970s have taken off. As the size of the personal sector's financial portfolio grew, so did the issue of securities by financial intermediaries. Thus even though the share of bonds and equities directly held by individuals remain close to 30 percent, it is now much more likely that holdings of securities are funding financial intermediation. Importantly, this is also true of mutual fund holdings (including MMMFs) and claims on pension and insurance sectors, which now account for half of the personal-sector portfolio. (See figure A.4).

The bottom line is that households have shifted from holding securities directly to investing in intermediaries that invest in securities (and in

⁵³ As noted, the share of total credit market debt issued by financial firms was quite small, and insurance and pension funds didn't hold that much in the way of equities fifty years ago (only around five percent of their portfolios were in corporate equities).

⁵⁴ Credit-market debt issuance by financial intermediaries had also risen to 10 percent of total outstanding credit-market debt; hence it is important to point out that securities directly held by individuals were issued by financial firms as well as nonfinancial firms.

Figure A.2

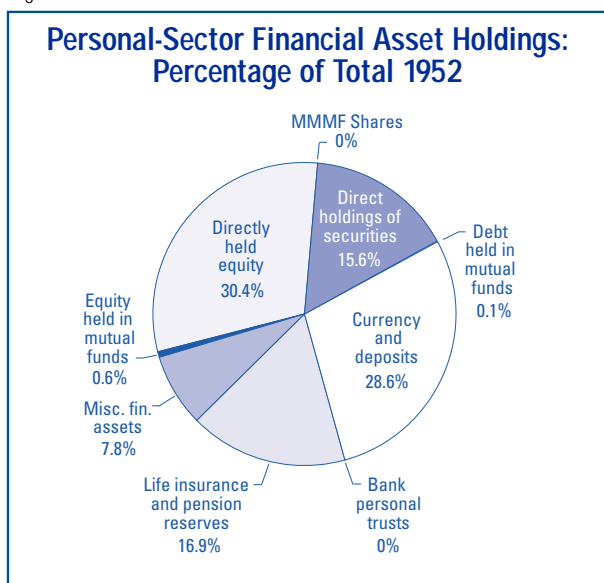
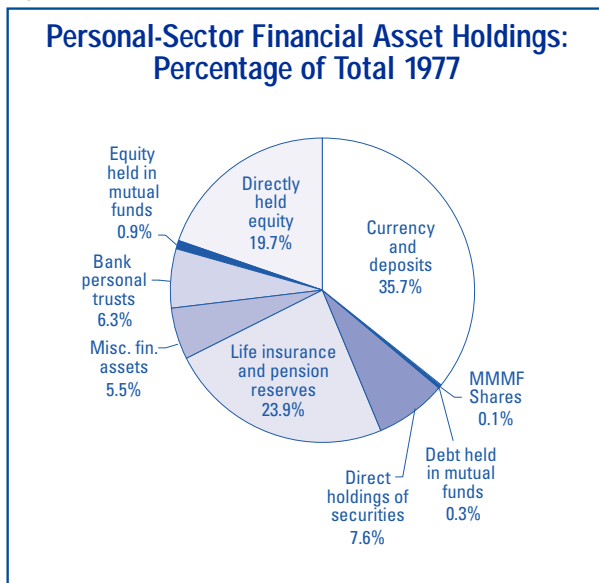


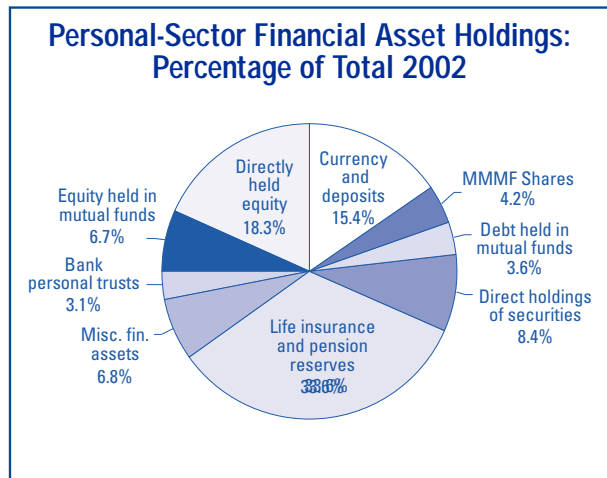
Figure A.3



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mutual-fund shares) that fund financial intermediaries as well as nonfinancial borrowers. And whereas it used to be mainly wealthier households that held securities, mutual funds and pension plans have broadened the access of the average household's access to direct credit and equities markets. Thus personal portfolio trends have facilitated the absorption of the greater amount of debt being issued by direct credit markets—including debt issued by financial sectors—including ABS-issuers and federally-related mortgage pools.

Figure A.4



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The Future of Banking in America

The Effect on U.S. Banking of Payment System Changes

by Neil B. Murphy*

Introduction

It is now three decades since the dawn of the “checkless, cashless society” was proclaimed. Cash is still in use, although much of it is outside the United States, and many checks are still being written. It is tempting to dismiss the predictions of those days as being misguided and of no major consequence for the structure and financial health of the banking industry in the United States. However, major changes in the U.S. payment system as a whole are underway. These changes will have an effect on costs, profitability, mix of business, and delivery systems that must be considered in an assessment of the future of banking in the United States.

It is traditional for a payment system to be the primary concern of the central bank.¹ This tradition is related to the central bank’s responsibility for monetary policy. After all, the central bank creates a nation’s money supply, and the payment system influences the velocity of that money and its utility when households, businesses, and governmental units make payments. Thus, the focus of the central bank’s concern is the efficiency of the payment system and the avoidance of any systemic risk arising from its operations. Moreover,

the central bank is concerned with mitigating any moral hazard that may occur because of such activities as discount window lending and the supplying of intraday credit (daylight overdrafts) to participants in the central bank’s large-value funds transfer service (Fedwire). Indeed, central bankers have been meeting for some time to deal with these problems. The Committee on Payment and Settlement Systems (CPSS) is composed of central bankers from the G-10 countries and is housed at the Bank for International Settlements in Basle, Switzerland. The CPSS has issued many influential reports concerning these issues and recently published a set of “best practices” for systemically important payment systems.² The CPSS has also published reports that discuss the role of the central bank in retail payment systems.³

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¹ The payment system as a whole comprises a number of component payment systems; thus the word “system” is used in this paper sometimes to refer to the overall system and sometimes to refer to the individual components.

² See CPSS (2001).

³ See CPSS (2000, 2003).

The focus of this paper is on the changes underway that influence the health of the banking industry in the United States. At the outset, it should be noted that the United States is somewhat of an outlier among developed nations when it comes to the nature of its payment systems:

- The use of the check as a means of payment is far greater in the United States than in any other country, even though the number of checks has actually declined in recent years and the share of checks in total noncash payments has been declining for some time.
- In the United States, the central bank (the Federal Reserve System) owns and operates substantial segments of the payment system. In most countries, the central bank supervises but does not operate the retail payment system.

Furthermore, the focus of this paper is on payment systems other than the large-value payment systems. At the heart of every nation with highly developed financial markets is a real-time gross settlement system (RTGS) that is operated by the central bank. In such a system, funds are wired by banks on behalf of their customers to other banks. The banks actually transfer funds from and to their accounts on the books of the central bank. In the United States, the RTGS is Fedwire, which is owned and operated by the Federal Reserve System. The *gross* feature of the system refers to the fact that each transaction is settled separately. An alternative that requires less liquidity for the banks involved is a netting system in which payments to and from banks accumulate and only the *net* difference is transferred. What that means is that, on receipt of the funds, the recipient bank and its customer do not have access to those funds until the accumulated inflows and outflows are netted and settled. The *real-time* feature of the system means that the funds received are available at exactly the time when they arrive. There is no wait for accumulated inflows and outflows to largely offset each other, with only a smaller net amount transferred. More funds are transferred by Fedwire and the Clearing House Interbank Payment System

(CHIPS), a private sector large-value payment system, than by any other payment method. However, the number of transactions is small, and most of the activity is confined to a small number of money-center banks.⁴ This is not meant to downplay the importance of these systems, but the proper focus for them has been the risk management associated with either intraday loans (daylight overdrafts) or the potential systemic effect of unwinding payments in a multilateral netting system when one of its participants is unable to settle its obligation. These systems are highly automated and will probably not change too much in the future in response to forces of technology or shifts in consumer preferences.

However, there are changes underway in the United States in noncash retail payment systems other than the large-value payment systems that will affect the future of the banking industry. These include a diminution in the number of checks written and increases in electronic forms of payment. Moreover, even though fewer checks are being written, the number is still very large in absolute terms and in comparison with the number in most other countries. Therefore, efforts are underway to “electronify” the checks early in the process of clearing and settlement, sending the information contained on the check forward electronically. This is expected to be cheaper and faster than current methods, in which large numbers of pieces of paper are transported around the country.

Some Basic Characteristics of Payment Services and Banking

All noncash methods of payment involve interbank transfers of funds. Hence, many basic product lines in banking are tied to the various

⁴ For a discussion of wholesale payment systems in general, see Folkerts-Landau (1997); and for a discussion of risk management for Fedwire, see Coleman (2002). The CPSS best practices, or “core principles,” are appropriately applied to “systemically important payment systems,” and Fedwire is certainly such a system. Recently the Federal Reserve published a “Self Assessment of Compliance with the Core Principles for Systemically Important Payment Systems” (2001).

systems by which balances are transferred from one bank to another on behalf of customers. These products involve either a direct charge to a customer's demand deposit account as a result of a transfer, or a payment on behalf of a customer—a loan to the customer that will be satisfied at a future date. In most of the payment systems, it is efficient to have a network that includes all bank participants. Thus, all products tied to an interbank transfer network involve the following:

- The paying customer
- The bank at which the paying customer has an account
- The receiving customer
- The bank at which the receiving customer has an account (which may not be the same as the customer's bank)
- An operator of a network in which many banks may participate.

The notion of a network gives rise to the concept of *network externalities*. That is, a product or service tied to a network has value that is enhanced by its link to other users. This is especially true for communication systems, and it can be argued that payment systems are really forms of communication systems.⁵ Consider the value of a telephone that is not connected to any other callers. Clearly, the value of the telephone and a contract to use it to communicate depends on the use of the same product and service by large numbers of other users. This gives rise to a situation in which there is a potential trade-off between efforts to achieve universality of use to maximize these externalities and the concern about limiting competition and innovation. It also raises the issue of who owns and operates the network.

Interbank payments, when there is not an instantaneous transfer of funds as there is in a cash transaction, involve some risks. In a cash transaction, clearing and settlement of the payment occur immediately. For most interbank payment systems, there is a delay between the time a payment is initially cleared and the time the participants settle all claims among themselves. All

participants must be able to meet their net settlement obligations to the network. If one participant cannot settle, many other transactions are at risk. In some cases, there is also some counterparty risk in that a customer may not have sufficient funds to honor a payment instrument that is presented through a network. This is especially true for debit transfer transactions.

There are two basic types of interbank transfers: credit transfers and debit transfers. In a *debit transfer*, a payer sends a payment instrument, usually a check, to a payee. The payee then deposits the check in its bank, which collects the check through the interbank payment system. Hence, the payee has a provisional credit to its account, contingent on the payment instrument's being honored upon presentation. The risk is that the payer (the counterparty) does not have sufficient funds to honor the check. Only when the payment instrument clears is the payee free from the counterparty risk.⁶ In a *credit transfer*, the payer notifies its bank to transfer funds to the account of the payee in the payee's bank. Thus, the recipient of the communication, the payee's bank, does not need to worry about counterparty risk. Either the payer has sufficient funds to make the transfer, or the payer's bank advances sufficient funds to make the transfer.⁷ Note that counterparty risk involves payers and payees, whereas settlement risk involves banks in the interbank funds transfer system. For debit transfer systems, both counterparty and settlement risk exist. For credit transfer systems, only settlement risk exists.⁸

⁵ For an extensive discussion of the network characteristics of payment systems, see Lacker and Weinberg (1998).

⁶ Not all debit transfers are checks, for debit transfers occur in the Automated Clearing House (ACH) system in the United States. That is, a payer authorizes a payee to transfer funds through the ACH system by having the payee's bank present an electronic debit through the ACH and deduct funds from the account of the payer in the payer's bank. There is still counterparty risk in that the payer must have sufficient funds.

⁷ Whether something is called a credit transfer or a debit transfer depends on the action of the receiving financial institution. If the receiving financial institution debits the payer's account, it is a debit transfer. If the receiving financial institution credits the payee's account, it is a credit transfer. It should be noted that *only* credit transfers occur on the large-value RTGS payment systems.

⁸ The exception to this, of course, is the RTGS large-value payment systems in which settlement occurs instantaneously. However, if the central bank advances funds to participants during the day (daylight overdraft), that

If a payment system may be viewed as a communications network, all participants must have clear agreements as to their duties and obligations related to their participation. This is reflected in law, in regulations, and in contractual agreements among the various parties to the network. In the United States, there are a number of different legal and regulatory arrangements for the different networks, and there are also situations in which different transactions in the same network have different legal and regulatory arrangements. Moreover, there are differences among the networks as to exactly who owns and operates the network.

Payment Systems in the United States

In the United States, there are a number of different payment networks that have evolved over time. These include the following:

- The system of check payments—a debit transfer system—which is presently paper based and the networks for which they are operated by both the banking community and the Federal Reserve System.
- The automated clearing house (ACH) system, which is an electronic batch-processing system in which most of the processing is done by Federal Reserve Banks. Transactions can be either debit or credit transfers.
- The debit and credit card systems, whose networks either have evolved from automated teller machine (ATM) networks or are owned and operated by a few major card organizations, primarily VISA and MasterCard.

The common element in all these systems is the communications link between banks in which information regarding payments and customer accounts is transmitted from one bank to another, with appropriate adjustment to customer account balances. In most cases, the customer account is a demand deposit account that is adjusted (debited for the payer, and credited for the payee). However, there are also cases in which funds are advanced through the system on behalf of the

payer, to be credited to the payee's demand deposit account. In such cases, the bank has a receivable from the payer to be settled later according to the credit agreement between the payer and the bank. This describes a credit card transaction.⁹

The Check System

The check system is the oldest interbank payment system in the United States. It evolved in the second half of the nineteenth century as banks in the United States switched from note issue to deposit banking as a result of a 10 percent tax on notes.¹⁰ Indeed, two of the reasons for the establishment of the Federal Reserve System were to implement a nationwide check-clearing system (since U.S. banking laws precluded any bank from having a national network of branches) and to eliminate the practice of nonpar banking (the bank on which a check was drawn might not honor the full value of the check when it was presented for payment).¹¹

The legal framework for the check system comprises both state and federal laws and regulations. The Uniform Commercial Code (UCC) represents an agreement among the states to adopt similar laws in the area of commerce. Within that code are several parts that deal with payments and settlement: Article 3 (negotiable instruments), Article 4 (bank deposits and collections), and Article 4a (fund transfers, including wholesale ACH credit transfers). In addition, Congress passed the Expedited Funds Availability Act of 1987 (EFAA), which gave the Federal Reserve System the responsibility of implement-

transaction involves some credit risk if the bank to which credit has been advanced cannot bring its account back to zero at the end of the settlement period.

⁹ There may be some debate as to whether a credit card transaction and the credit card networks constitute a payment system, since the payer's demand deposit account is not debited as a result of the transaction. However, payment does occur over an interbank network, and the Committee on Payment and Settlement Systems, the ultimate arbiter of things related to payment systems, includes credit card transactions in its data on different countries' payment systems in its "Red Book."

¹⁰ See Friedman and Schwartz (1963).

¹¹ See Weinberg and Lacker (1998).

ing improvements in the check collection system. When the Federal Reserve acts on that authority, federal law supersedes state law. The Federal Reserve has several regulations that affect check collection: Regulation CC and Regulation J both affect the processing of collections and returns through the Federal Reserve System. On October 28, 2003, Congress passed and the president signed the Check Truncation Act of 2003, which paves the way for electronic presentment and collection of checks.¹²

Within that legal framework, the check collection system does not function through a single channel. When a payee receives a check, he or she deposits it in a bank. That bank then has a number of choices available to collect the check:

- It is possible that the payer and payee do business with the same bank. In that case, balances are shifted on the books of that bank, and there are no interbank transactions. This is known as an “on-us” transaction, in which there is no delay in settlement. Also, the processing costs are lower. The consolidation of the banking industry has increased the probability that any given check will result in an on-us transaction.¹³
- The bank of first deposit may decide to present the check directly to the bank on which the check is drawn. This occurs in situations where two banks are in close proximity and have a lot of bilateral transactions. This is known as a “direct send.”
- The bank of first deposit may present the check to a local clearing house, an arrangement whereby a number of banks agree to meet for the purpose of presenting checks to each other and settling the net differences at the end of an agreed-upon period.
- The bank of first deposit may avail itself of the services of another bank—a correspondent bank—to collect the check on its behalf.
- The bank of first deposit may deposit the check with its local Federal Reserve Bank, which will then collect the check from the bank on which it is drawn.

In 1980, the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) required that the Federal Reserve charge for its clearing and settlement services. Before that time, Federal Reserve services were provided without any direct, explicit charge. As might be expected, however, correspondent banks that competed with the Federal Reserve objected to this arrangement. To compete on a comparable basis, the Federal Reserve was required to base its prices charged for clearing and settlement services on its explicit costs and on an adjustment for the cost of capital that its competitors must factor into their cost structures.¹⁴ In addition, the Federal Reserve System must recover all its costs in the provision of these services. The choice made by the bank of first deposit depends on the relative costs and benefits of the different channels.

In 2001, it was estimated that 41.2 billion checks were written in the United States. Approximately 43 percent of these checks cleared through the Federal Reserve System; 28 percent cleared as direct sends, clearing house items, or through correspondent banks; and 29 percent were “on-us” checks.¹⁵

It has long been known that the U.S. payments system depends more on checks than is the case in all other industrialized nations.¹⁶ Since a great deal of effort, energy, and expense is incurred in moving large amounts of paper long distances, the

¹² For a discussion of the legal and regulatory environment of payments in the United States, see CPSS (2003).

¹³ In Gerdes and Walton (2002), it is noted that the proportion of “on-us” checks has not increased much even though the industry has consolidated. They attribute this to the reduction in checks written for cash (these are being replaced by ATM withdrawals) while on-us checks sent to payees have increased.

¹⁴ For a thorough discussion of the methods and rationale for calculating the private sector adjustment factor (PSAF), see Green, Lopez, and Wang (2003).

¹⁵ It is not the usual practice for the central bank to *operate* substantial segments of retail payment systems, nor is the Federal Reserve’s role as both operator and regulator without controversy. The Federal Reserve undertook an extensive review of its role several years ago and concluded that present arrangements are satisfactory. See Board of Governors of the Federal Reserve System (1998).

¹⁶ For an excellent review of comparative developments of payment practices in major industrialized nations, see Humphrey, Sato, Tsurumi, and Vesala (1996).

demise of the check has been seen as inevitable and desirable. However, obtaining accurate information on the exact number of checks processed in the United States is not easy. Given the number of routes that any check might take and the fact that a single check may pass through several channels, it has been difficult to collect such data every year. However, there are several benchmark years in which exhaustive surveys were undertaken. The practice was then to extrapolate out from those benchmarks on the basis of incomplete information and assumptions about the proportion of checks going through the various channels. Such benchmarks were available as a result of surveys undertaken by the Federal Reserve System in 1979 and 1995. On the basis of those surveys and other fragmentary information, it appears that the number of checks processed in the United States was overestimated for a number of years. It is instructive to examine the report of the Committee on Payment and Settlement Systems on the payment systems of selected countries. The report is an annual publication with data for a number of wealthy nations, prepared in a similar format for purposes of comparative analysis. As late as 2001, when data for 1999 were reported, it was believed (primarily on the basis of extrapolations from the 1995 benchmark) that there were over 67 billion checks processed in the United States. However, as a result of a substantial survey undertaken by the Federal Reserve, it was determined that in the year 2000 there were only 42.5 billion checks written in the United States.¹⁷ In a prescient article, Humphrey, Pulley, and Vesala forecast that the number of checks written would peak in 1997.¹⁸ It is estimated that in 2001, the number declined once again to 40.2 billion checks (CPSS, 2002). It had generally been believed that check growth had been positive but smaller than the growth in alternative electronic payments, resulting in a reduction in the check share of noncash payment instruments in the United States.¹⁹ The latest developments suggest that the share of electronic payments has increased faster than was originally believed. Further evidence of the decline in checks written arose recently, when the Federal Reserve indicated that

the number of checks processed during 2003 had declined at a faster rate than had been forecast. Because the Federal Reserve must recover all its costs in supplying processing services, it announced that it was raising its charges to banks, reducing the credits to banks for clearing balances maintained at the Federal Reserve, and changing the method of calculating imputed income from investing the clearing balances. At the same time, it announced a reduction in charges for processing electronic automated clearing house (ACH) payments.²⁰ This raising of prices for processing paper and lowering of prices for processing electronic transactions should reinforce the trends already in place.

However, it should be noted that, notwithstanding the unexpected change in the volume of checks processed, the United States is still relatively more dependent on checks than its counterparts. In 2001, the United States wrote 144.6 checks per capita, more than twice as many as the next-highest user of checks—France, with 71.2 checks per capita. Countries in Continental Europe, except France, have virtually eliminated checks: Belgium, Germany, Italy, the Netherlands, Sweden, and Switzerland all had 10 or fewer checks per capita in 2001. In Sweden, there was 0.2 check per capita written in the year 2001 (CPSS [2002]).

The latest developments for the check system in the United States are related to what might be called the “electronification” of checks. There are two such strands of this process; one is underway already and the other will probably be available in the near future. First, the ACH system has developed three new applications that use the check as a device to trigger a debit transfer on the

¹⁷ See Gerdes and Walton (2002).

¹⁸ Their projections were based on data available up to 1996, even though the publication date of the article is 2000.

¹⁹ One casualty of this decline is the Federal Reserve System itself, which announced in February 2003 that it was consolidating its check-processing operations, eliminating this activity from 13 offices and reducing staff by a projected net of 400 employees. See Federal Reserve Bank of Boston (2003).

²⁰ See Board of Governors of the Federal Reserve System (2003a, 2003b).

ACH system. In one of these applications, the point-of-purchase (POP) application, a merchant receives a check in payment for goods or services. Instead of depositing the check in the familiar process, the merchant uses a terminal to scan the information on the bottom of the check (the “MICR” line) and the amount of the sale. The merchant then returns the check to the customer with the word “void” printed on it and informs the customer that the check amounts to authorization for the merchant to initiate a debit transfer transaction through the ACH network. There is also a legal transformation in which the check is no longer a negotiable instrument governed by the UCC and Federal Reserve regulations pertaining to checks, but is instead a “source document” for an electronic transaction that is subject to the Federal Reserve’s Regulation E (a regulation promulgated as a result of the Electronic Fund Transfer Act of 1978). In a similar move (the second ACH application), the ACH system developed the accounts-receivable check (ARC), which is designed to transform checks to “source documents” as consumers mail checks to lockboxes in payment of routine bills. That is, the customer is notified that the check is an authorizing device allowing the payee to initiate a debit transfer transaction through the ACH system. Again, the legal status of the check changes, and the operative legal and regulatory environment changes from UCC/Federal Reserve check rules to Electronic Fund Transfer Act/Regulation E electronic transaction rules. The ARC application is available only for consumer payments at the present time. In the past year, from the third quarter of 2002 to the third quarter of 2003, the number of transactions in each category (ARC and POP) grew substantially. For the ARC transaction, there were 5.3 million transactions in the third quarter of 2002, which grew to 43.7 million in the third quarter of 2003. In the same period, the POP application grew from 28.7 million to 38.4 million. Another area for check electronification is in returning checks (RCK) via the ACH system (the third ACH application). That is, when a customer pays with a check, he or she is notified that should the check be returned for insufficient funds, the payee will initiate a debit

transfer through the ACH system to collect the amount. In this case, the paper process has failed, and the payee has access to faster and cheaper collection the second time around. This application has increased from 4.8 million transactions in the third quarter of 2002 to 5.8 million transactions in the third quarter of 2003. Hence, the ACH system has evolved to transform and process several new types of application, all designed to replace the paper movement of physical checks with electronic collection.²¹

The final step in electronification of checks—the second of the two strands referred to above—is underway at the present time. Instead of piecemeal ACH applications for point of sale or routine consumer bill payments, this step involves a complete transformation of the processing of paper. This is called the Check Truncation Act of 2003, which the president signed on October 28, 2003. The Expedited Funds Availability Act of 1987 had given the Federal Reserve the task of making recommendations to improve the payments system—in effect, superseding the UCC—and the Federal Reserve System proposed the check truncation legislation.²² What is envisioned here is the “truncation” of checks early in the process of physical transportation. At that step, a digital image of the check will move electronically through the process. This will eliminate the physical transportation of checks and allow the images to be retrieved as needed by customers to show evidence of having made payment.²³ It is too early to know exactly how this development will affect the number of checks processed and the channels through which the images of checks will pass on the way to collection.

It is interesting to compare this development with some of those in the European Union (EU). The EU has moved to a single banking market and a

²¹ See NACHA—The Electronic Payments Association (2003).

²² See Check 21 Act, Public Law 108-100, October 28, 2003.

²³ Many banks and thrift institutions have already truncated checks by not returning them to customers. This act will stop the movement of paper earlier in the process. Moreover, for many years, credit union legislation and regulation have made truncation of credit union share drafts mandatory.

single currency.²⁴ While the large-value payment system in Euros is connected seamlessly throughout the EU, this was not the case for cross-border retail payments. However, the EU and the European Central Bank (ECB) reasoned that the benefits of a single, integrated, competitive banking market could not be achieved without an efficient retail payment system in which cross-border payments would be made with the same speed and fees as domestic payments. The EU and ECB encouraged the banks to develop such a system. Since developments did not proceed as rapidly as the EU and ECB wanted, the EU enacted legislation requiring the banking industry to process cross-border payments under the same terms as domestic payments. The industry responded by setting up a Single European Payments Area concept that is similar to an ACH connecting the domestic payment systems in all the member nations.²⁵ What is interesting is that the EU/ECB focus is on *credit transfers* in the EU, rather than *debit transfers*, or checks. It appears that the EU, in its efforts to complete the single market in banking, considers the benefits of the credit transfer to be sufficient and therefore encourages these transfers while ignoring the debit transfer.²⁶

The Automated Clearing House (ACH) System

The ACH system is a batch-processing electronic payment system for small-value payments. Unlike the large-value payment systems (Fedwire and CHIPS), which process only credit transfers, the ACH system processes both credit and debit transfer payments. Financial institutions belong to one of 29 regional associations and participate in the ACH system as either originating depository financial institutions (ODFI) or receiving depository financial institutions (RDFI) or both. Originators and receivers are customers, and, as indicated, the transactions can be either credit or debit transfers. The originator prepares a file of transfers, delivers it to the ODFI, and the ODFI delivers the data to the ACH operator, who then transmits the information to the RDFI, who either credits or debits the account of the receiver,

depending on the nature of the transfer. There is a national association of depository financial institution members, the National Automated Clearing House Association (NACHA), which determines all the rules and regulations that govern the network.

There are a number of laws that provide the legal and regulatory framework for the ACH system. For corporate transactions, the UCC is the operative law. The Check Truncation Act of 2003 has implications for the ACH system as well. For consumer transactions, the Electronic Fund Transfer Act of 1978 is the operative law, and Federal Reserve Regulation E is the operative regulation. In addition, the federal government's role in electronic payments is governed by federal law, specifically 31 C.F.R. 31, Part 210. According to the provisions of the EFT Expansion Act/Debt Collection Improvement Act of 1996, the U.S. government has committed itself to using electronic payments for all payments to employees, vendors, and recipients of benefits. Moreover, federal tax collections are migrating to electronic form as well. Most states are following the lead of the federal government in this area.

According to NACHA, in December 2002 almost 19,500 depository financial institutions participated in the ACH system as RFDIs, while approximately 8,000 participated as OFDIs.²⁷

From 1992 to 2002, the volume of ACH transactions increased at a double-digit percentage-rate change each year, going from 2.2 billion transactions in 1992 to over 8.9 billion transactions in 2002, a compound annual rate of growth of over 13.5 percent. In contrast, the number of checks actually declined over the same period. In the early days of the ACH, a large proportion of the volume was attributable to government payments. In 1992, government transactions were 24 per-

²⁴ For a discussion of this, see Murphy (2000).

²⁵ See European Central Bank (2003).

²⁶ Humphrey, Pulley, and Vesala (2000) note that the European credit transfer systems have been much more amenable to technological change than the check (debit transfer) system in the United States.

²⁷ See NACHA (2003).

cent of the total, while in 2002 this declined to less than 10 percent. It is reported that 98 percent of federal employees use direct deposit of payroll, while 80 percent of all Social Security recipients use direct deposit of benefits. As noted above, electronic payment to vendors is virtually mandatory. Thus, the government is not likely to be a future source of major growth in volume.

One change in the types of applications for the ACH system is the movement to nonrecurring transactions. In the past, the ACH system developed applications for recurring payments, such as direct deposit of payroll and benefits, and for recurring debits for the same amount for payments such as mortgages, installment loans, insurance payments, and other such payments. On the corporate side, direct payment of vendors, payment of taxes, and corporate concentration of funds from a number of banks were all recurring repetitive transactions. Once a payment is arranged, it is repeated without the need for frequent authorizations and other arrangements. In recent years, the ACH community has turned its attention to transactions initiated by consumers. These include the point-of-purchase (POP) application discussed above, payments authorized over the telephone (TEL), and payments initiated over the Internet (WEB). These are all transactions that require a separate process each time a transaction is initiated. For many traditional applications, such as direct deposit, the consumer enters into an agreement one time, and the process is opaque to him or her. All that these consumers know (when there are no problems) is that balances appear in their accounts at certain times or that certain amounts are deducted at certain times. The consumers themselves are passive. In the newer applications, the initiator is an active participant. Since these are new applications, the growth rate for them is very high, starting from a very low base.

Automatic Teller Machines (ATMs) and Payments by Debit Cards

One of the first electronic banking applications was the implementation of the ATM. It is

arguable as to whether this is really a payment system in the sense of the other systems discussed here. That is, the vast majority of transactions are cash withdrawals in which the customer and the bank interact, but there is no third or fourth party to the transaction, and at the outset of the development of this application there was no network. However, this application does allow the customer access to cash, which is a payment alternative, and in that sense the banking system is allowing the customer to have efficient access to using cash to make payments. Also, use of the ATM allows the customer to economize on the use of currency, and evidence indicates that customers therefore hold higher deposit balances than otherwise would be the case.²⁸

In the early days of the implementation of ATM programs, there were questions as to whether these would be considered branch offices and hence be regulated by the McFadden Act and the various state branching laws. If they were, the deployment of this new application could be limited. However, in 1985 the U.S. Supreme Court upheld a circuit court ruling that an ATM was not a branch. As a result of this ruling and the popularity of the ATM with customers, especially upscale consumers, the number of ATMs increased dramatically.²⁹ As the deployment of ATMs continued, some banks started networks that allowed customers of other banks to access their accounts. This required someone, usually a large bank at the outset, to operate a “switch” that would route transactions among the various banks participating in the network. The basic idea was to enhance customer convenience by expanding the locations at which access was available. In addition, networks allowed banks to take advantage of scale economies in processing by increasing the potential number of transactions per machine. Over time these networks expanded and merged. This trend has resulted in several large regional networks, a few national networks, and a group of smaller networks. The

²⁸ See Daniels and Murphy (1994a, 1994b).

²⁹ For a discussion of the contemporaneous demographic pattern of adoption of ATMs, see Murphy and Rogers (1986).

number of networks peaked at approximately 130 in the mid-1980s; now fewer 40 are operating. Moreover, transaction volume is concentrated in a small number of large networks. In 1985, the top three networks processed 11 percent of the transaction volume; in 2002 that percentage exceeded 100 percent (some transactions are counted more than once, since they may travel over several networks). As these networks expanded, they negotiated reciprocity agreements with other networks, effectively expanding the reach of any single customer's ATM card. In addition, national networks can and do serve as bridges between regional networks. Most ATMs (over 98 percent) are part of shared networks, and as a result of both reciprocity and bridging they are national (or international, in the case of the Visa and MasterCard networks).³⁰ The ownership structure of the networks has changed dramatically also, with an increase in the number and share of networks owned by nonbanks. This shift has occurred as the number of networks owned by joint ventures of banks has declined.

As a result of almost 25 years of development, the ATM application is the most mature of electronic banking services. There are presently over 350,000 ATMs deployed in the United States. The proportion of off-premise ATMs has increased dramatically as banking offices that are candidates for on-premise ATMs have been saturated. Also, as the cost of machines has declined over the years, the break-even volume necessary to justify the investment cost has declined. Hence, the number of transactions has steadily increased while the number of transactions per machine peaked in the early 1990s and has steadily declined since then.

As the ATM networks expanded, it became apparent that they could be used for other transactions as well. Thus, the ATM networks evolved into the point-of-sale (POS) networks accessed by debit cards. Customers became familiar with the process of accessing their accounts with a plastic card through the ATM, and the use of the same cards and networks at the point of sale evolved naturally. The customer would

access the network with a plastic card in a manner similar to the ATM, would identify himself or herself with a personal identification number (PIN), and funds could be deducted from the customer's account. The only difference is that the funds were not made available in the form of cash but instead were transferred to the account of a merchant who decided to accept the debit card as a way for the customer to pay for goods and services. Of course, with virtual universal network coverage through reciprocity and bridging, it was possible for the customer to make payment on-line at the point of sale easily.

Debit card transactions have been growing rapidly. In 1979, they were virtually nonexistent, whereas in 2000, 8.3 billion such transactions were recorded. When compared with general-purpose credit cards, a much more mature product, the relative growth is striking. In 1995, there were 1.4 billion debit card transactions and 7.8 billion general-purpose credit card transactions, whereas in 2000 the comparable numbers were 8.3 billion and 12.3 billion. In 2000, debit cards accounted for 11.6 percent of all retail noncash payments, up from 2.2 percent in 1995. From 1995 to 2000, debit card transactions grew at the fastest rate of all types of retail noncash payments (a 41.8 percent annual rate, compared with a 2.2 percent growth rate for all payments).³¹

Within the debit card industry, there are two types of transactions. One is an on-line transaction activated by a PIN at the point of sale, with immediate debiting of the customer's account and crediting of the merchant's account. All this information travels over the same networks as the ATM transactions, and there are fees involved for the merchant, who is charged on a fee-per-transaction basis. There are also point-of-sale transactions that are known as *off-line*, signature-based transactions. In this case, the information flows over the credit card networks managed by Visa or MasterCard. In the on-line transaction, there is a

³⁰ For a thorough discussion of the ATM/debit card network industry, see Hayashi, Sullivan, and Weiner (2003).

³¹ See Gerdes and Walton (2003).

PIN to identify the cardholder, whereas in the off-line transaction the merchant is responsible for verifying the identity of the cardholder. In the off-line transaction there is also a delay in transferring the funds, and, most importantly, there is a difference in the fee structure. The merchant is charged a fee based on the size of the transaction, and the fees to the bank are generally larger in that case. For that reason, the banks have discouraged the use of on-line debit transactions in favor of the off-line debit card. Merchants have opposed this. In 2003, a major court case involving Wal-Mart and Visa and MasterCard was settled. In that case, the retailers opposed the “honor-all-cards” rule that required any merchant accepting either Visa or MasterCard credit cards to honor all their cards, including the off-line debit cards. Wal-Mart wished to honor the credit cards but not the off-line debit cards. The settlement—that merchants no longer have to honor all cards—will probably affect the structure of fees over all of the varying debit card networks and move volume to the PIN-based transactions.

Credit Cards

Credit cards are the most mature electronic payments product. Although individual retailers had issued cards to their customers for many years, the general-purpose credit card dates back to Diners Club in 1950.³² At that time, as the name indicates, the basic idea was to have a credit card accepted by a number of restaurants in Manhattan, and customers would have to carry only a single card to be able to dine. It was assumed that businessmen who customarily had business lunches and dinners would find this appealing and that those restaurants that sought to attract their business would also find it appealing. This resulted in the Diners Club program. During the 1950s, a number of banks tried to introduce bank credit cards without much success. Not until 1958 did American Express, Carte Blanche, Chase Manhattan Bank, and Bank of America enter the field. In 1962, Chase Manhattan left the business and American Express reportedly considered giving up its travel and entertainment card. Not until 1966 did Bank of America estab-

lish a franchise operation for its card, then known as BankAmericard. Thus, a franchisee bank could issue a credit card that could be used nationally (and eventually internationally). BankAmerica Service Corporation also established a network that allowed payments between banks dealing with merchants and banks issuing the cards to consumers. This was quickly followed by a consortium of banks that established the Interbank Card Association, which established another network and bank card eventually known as MasterCard.³³ In 1970, Bank of America spun off BankAmerica Service Corporation to a (bank) member-based organization that eventually became Visa USA. Thus, both MasterCard and Visa USA basically offer a franchise to their members and manage the interchange system, establishing the pricing of interchange services and the rules and regulations governing these operations. There was a shaky start that saw huge losses due to large-scale unsolicited issuance of cards in the late 1960s (a practice that is now illegal); there was also a time when rampant inflation and high interest rates made the bank credit card business unprofitable. However, the acceptance of bank credit cards at the point of sale (which now includes a personal computer attached to the Internet) became so widespread that it is difficult to imagine that this oldest of the widely used electronic payment systems is less than 50 years old.

The legal and regulatory environment for the bank credit card industry includes state law (mainly usury laws), federal consumer credit law, and the outcome of court cases. The maximum rate that a lender can charge for consumer credit is established on a state-by-state basis. This became a difficult problem for the industry when interest rates were very high, and in some states legal maxima were less than banks' cost of funds. In a landmark court decision in 1978, the U.S. Supreme Court ruled that the lender's location determined the operative state usury ceiling no matter where the customer may live, even if the

³² See Mandell and Murphy (1976) and Mandell (1990).

³³ See Evans and Schmalensee (1999).

state in which the customer lived had a lower usury ceiling. This gave incentive to large card issuers to find a lender-friendly state in which to establish national operations. Several states, especially South Dakota and Delaware, aggressively solicited such bank card operations. In the 1970s, Congress enacted a number of consumer credit protection laws, at least partly as a response to the marketing and other practices of the bank credit card industry. These laws include the Truth-in-Lending Act of 1968, the Fair Credit Billing Act of 1974, the Equal Credit Opportunity Act of 1974, the Fair Credit Reporting Act of 1971, the Fair Debt Collection Practices Act of 1977, and the Electronic Fund Transfer Act of 1978. In addition, federal bankruptcy law affects bank credit card operations.

There are now over 1.2 billion credit cards in the United States. Of these, 551.9 million are issued directly by retailers; the rest are bank credit cards or travel and entertainment cards. The number of transactions grew from 12.9 billion in 1997 to 17 billion in 2001, an annual growth rate of 5.78 percent. The proportion of retailer card transactions for 2001 was 11 percent of the total, down from 15 percent in 1997. The number of merchant locations at which these cards may be used is over 13 million.

Summary of Recent Developments in Payment Systems in the United States

In the past 25 years, the nature of the payments system in the United States has changed. In part the change has been dramatic; in part it has been slow. The different payment systems reflect the development of competing networks with a variety of legal and regulatory environments. The only common theme is that payments are routed through an interbank system. There are also a variety of owners and operators of the networks, including public bodies for checks and the ACH (the Federal Reserve System), national membership organizations for open networks of general-purpose bank credit cards (Visa and MasterCard), closed networks for some general-purpose credit

cards (American Express and Discover), and proprietary (both bank and nonbank) organizations for ATM and PIN-based on-line debit card networks. In general, the ACH and the debit card transactions have witnessed the greatest growth, whereas credit card transaction growth has been modest and payments by check have actually declined. In table 1, the number of transactions for the various categories are shown for 1979, 1995, and 2000, the years for which accurate data are available.

Table 1

The Use of Checks Has Declined While the Use of Retail Electronic Payments Has Increased			
Type of Payment	1979	1995	2000
	Number (billions)		
Check	32.8	49.5	42.5
Retail Electronic Payments	5.5	14.7	28.9
Debit Card	0.0	1.4	8.3
Credit Card			
General Purpose	1.5	7.8	12.3
Private Label	3.8	2.6	2.7
Retail ACH	0.2	2.8	5.6

Source: George R. Gerdes and Jack K. Walton II, The Use of Checks and Other Noncash Payment Instruments in the United States, Federal Reserve Bulletin 88, no.8 (August 2002), 361.

Users of Electronic Banking

Who uses electronic banking? The answer is households, governments, and businesses.

Households

A number of studies have examined the determinants of household use of payment services. It was found that the adoption process for new electronic banking services followed a predictable pattern, one in which demographic factors including income, wealth, education, and position in the life cycle (age) were systematically associated with the adoption of new payment products and services. In an early contribution, Mandell found that credit card use was positively associated with

income, wealth, education, and age.³⁴ In the 1980s, a study by Murphy and Rogers and two studies by Daniels and Murphy found similar patterns for the adoption of banking and payment products and services.³⁵ More recent studies found that the patterns remain the same, but the trend is toward greater use by all demographic groups. Kenickell and Kwast examined the data in the 1995 Survey of Consumer Finances and found that higher income and financial assets, and more years of education were all positively correlated with use of electronic banking services. Age is more complex because older households are less likely to use electronic banking, all other factors held constant, for almost all electronic banking services except direct deposit—a correlation reflecting the very high acceptance of direct deposit by Social Security recipients.³⁶ Stavins analyzed the data from the 1998 Survey of Consumer Finances with similar results.³⁷ Using the most recent Survey of Consumer Finances (2001), Mester showed that over 88 percent of households use some form of electronic payment instrument (ATM, debit card, direct deposit, automatic bill paying, or “smart card”). This is an increase from 76.5 percent. From 1995 to 2001, debit card use rose from 17.6 percent to 47 percent of households, direct deposit rose from 46.8 percent to 67.3 percent, and automatic bill paying rose from 21.8 percent to 40.3 percent. The most mature of applications, the ATM, rose from 61.2 percent to 69.8 percent. In Mester’s findings all the previously determined relationships between use and demographics remained, but the penetration had increased substantially, as reflected in the data on the dramatic increase in debit card transactions and the reduction in the number of checks written.³⁸

Governments and Businesses

As indicated above, in the United States all levels of government have actively pursued the use of electronic banking in making and receiving payments, including payments to employees, benefit recipients, and vendors. This has been largely successful, and the number of checks written by all levels of government has declined. As noted

above, government payments through the ACH system have increased modestly in recent years, indicating that for government this process is largely complete.

The business sector receives payments from households in various ways. Households pay businesses at the point of sale by cash, check, or debit or credit card. They pay businesses mostly by check in response to invoices through the mail. Businesses pay each other usually by check or through the ACH, and increasingly businesses pay taxes through the ACH as well. There are no business databases comparable to the Federal Reserve’s Survey of Consumer Finances. Hence, one has to seek indirect evidence from numerous sources to determine business use of electronic banking. First, it is clear that retail businesses find it necessary to accept debit or credit cards at the point of sale. Casual inspection of retail sites combined with a reported total of point-of-sale terminals in excess of 13 million in the United States is sufficient to indicate that businesses find it either convenient and low cost, or a business necessity, to accept POS electronic payments.³⁹ The concept of point of sale has been expanded to include the telephone and the Internet, and the credit or debit card is the payment instrument of choice here.

NACHA publishes data about the types of transactions processed through the ACH system. It is possible to make reasonable assumptions about the source and destination of many of these transactions and their use by businesses and governments. First, all direct deposits are considered business or government payments to households. This is one of the largest applications on the ACH system, with over 3.8 billion transactions in 2002. As indicated in the 2001 Survey of Consumer Finance and reported by Mester (2003),

³⁴ See Mandell (1970).

³⁵ See Murphy and Rogers (1986) and Daniels and Murphy (1994a, 1994b).

³⁶ See Kennickell and Kwast (1997).

³⁷ See Stavins (2001).

³⁸ See Mester (2003).

³⁹ It should be noted that the United States ranks high in per capita deployment of EFTPOS (electronic fund transfer point-of-sale) terminals in comparison with other developed countries. See CPSS (2003).

the direct deposit of payroll, Social Security, and other benefits, as well as pension and dividend payments, has been very popular with consumers. As a result its growth from 2001 to 2002 was only 4.7 percent, smaller than the double-digit-percentage increases in most other electronic transactions. Direct debits through the ACH involving recurring payments from consumers to businesses were over 2.8 billion in 2002, a 10.08 percent increase from 2001. These two applications—direct deposits and direct debits—usually represent recurring transactions.

Some of the other new ACH applications involve businesses in transactions that are not recurring. First, there is the point-of-purchase application in which a consumer check is transformed from a negotiable instrument to a source document. This involves a consumer-to-business transaction at the point of sale and is a direct substitute for either a debit or a credit card transaction. Other nonrecurring payment transactions from consumers to businesses include Internet and telephone-initiated transactions. Finally, a recent addition to the consumer-to-business electronic transaction menu is the accounts-receivable application, in which a check mailed to a lockbox is transformed at that point to a source document that is processed through the ACH system. All these applications have grown at very high rates.

Finally, within the ACH system there are various business-to-business transactions. These include trade payments as well as intracorporate payments designed to aggregate cash balances from a number of banks into a single account that can be used to efficiently make payments and invest surplus funds. These have grown at double-digit rates in recent years, in excess of 12 percent from 2001 to 2002.⁴⁰

Another way to gain some insight into business use of electronic banking is to examine the findings of a number of surveys of corporate use of cash management services. For example, in 2002 Phoenix-Hecht conducted its annual Cash Management Monitor and received responses from 1,665 corporations with annual sales in excess of \$100 million. One of the many findings of the

survey was that over 97 percent of large corporations and 92 percent of upper-middle-size corporations already used the ACH extensively. Indeed, Phoenix-Hecht sees little opportunity for expanded ACH volume in any application except consumer-authorized debits. Another interesting finding is the use of sweep accounts by over 75 percent of all reporting corporations. Sweep accounts allow daily movement of funds from demand deposit accounts into an overnight repurchase agreement or money market mutual fund. This is important for corporate use of electronic payment services. That is, corporations move funds out of demand deposit accounts where explicit payment of interest is prohibited. In this case, banks do not offer any earnings credit to offset fees, and therefore corporations have incentives to adopt the lowest-cost payment services.⁴¹ Moreover, respondents indicated that imaging technology and Internet applications were important areas being considered.⁴² Phoenix-Hecht also conducts a Middle Market Monitor for companies with annual sales between \$40 million and \$100 million. In 2003, 1,260 companies responded. Over 86 percent of these companies used the ACH, and many respondents indicated that initiating transactions over the Internet is one of the more important technology applications. Middle-size companies also used sweep products as well. In summarizing the results of the middle-market company survey, Phoenix-Hecht indicated that “although middle market companies typically use fewer cash management products than large companies, as a group the middle market usage ‘profile’ is becoming more like that of the larger companies.”⁴³ In a similar survey, Treasury Strategies, Inc., asked 131 large corporations (less than \$1 billion to \$25 billion in annual revenues) many questions about their treasury activities. While there were no specific questions on the use of particular payment services, there was substantial emphasis among respondents on streamlining operations, lowering costs, and aggressively using

⁴⁰ See NACHA (2003).

⁴¹ For a discussion of the use of sweep accounts in cash management, see Cook, Murphy, and Silverberg (2000).

⁴² See Phoenix-Hecht (2002).

⁴³ See Phoenix-Hecht (2003), 2.

technology to do so. Over 65 percent of all respondents used treasury work stations, a process that implies intensive management of all aspects of treasury operations, including adoption of least-cost methods of making payments.⁴⁴

While businesses, especially large and middle-market businesses, are aggressively using electronic payment methods, they are still involved in paper transactions. In a recent Federal Reserve study, it was estimated that consumers were the largest sector that wrote checks (50.9 percent of all checks written), and most of them (almost 2/3 of all checks written) were sent to businesses.⁴⁵ Businesses were the second largest writer of checks (32.3 percent of the total), mostly to consumers and other businesses. It would appear that the best candidates for further business adoption of electronic payment products would be check conversion or check truncation at the point at which checks are remitted to businesses, in many cases a lockbox. Also, there is room for expansion of electronic services to business-to-business payments. A recent study by the Association for Financial Professionals indicates that while most respondents used the ACH for payroll disbursements and cash concentration, payments to other businesses was limited by a number of factors, the most important of which was internal lack of integration of payments and accounting system technology.⁴⁶

Check Writing and Electronic Banking: An International Perspective

When the United States is compared with 13 other advanced industrial nations in 2001, an interesting pattern emerges. When measures of electronic banking are considered, the United States has a very high usage factor. For example, the United States has a large number of ATMs compared with its population. The average for the 13 countries is 875 ATMs per million inhabitants, while in the United States there are 1,137 ATMs per million. The United States has more than the average number of POS terminals that accept debit cards per inhabitant, more than the average number of debit card transactions per

inhabitant, more than the average number of POS terminals that accept credit cards per inhabitant, and more than the average number of credit card transactions per inhabitant. The same is true for number of cards (debit or credit) issued and held by inhabitants. However, the United States is still an outlier when it comes to check writing. In 2001, there were 144.6 checks per inhabitant written in the United States, more than twice as many as in France, the next-highest user of checks. The United States uses many fewer credit transfers as would be expected for a country that has been dominated by checks for so many years. The combination of high ATM use, high card use at the point of sale, and the large number of checks written indicates that the number of cashless payment transactions per inhabitant in the United States is much larger than in all other countries in this sample. There are 270.3 cashless payment instruments used per inhabitant in the United States and more than 201.1 cashless payment instruments used per inhabitant in France, the next highest.⁴⁷ Hence, the key to adopting a higher proportion of low cost transactions in the United States lies with reducing the number of checks written, since the adoption of most electronic payments has been successful, whether one examines trends or international comparisons.⁴⁸

Pricing Payment Services and Products

In the United States, there is a historical link between the regulatory environment and the nature of pricing for payment services, especially checks. For many years, banks were prohibited from paying interest to demand deposit customers, and there was a ceiling on what could be paid to customers with savings accounts or certificates of deposit. As interest rates in general rose in the post-World War II period, incentives were creat-

⁴⁴ See Treasury Strategies, Inc. (2003).

⁴⁵ See Federal Reserve System (2002).

⁴⁶ See Association for Financial Professionals (2002).

⁴⁷ See CPSS (2003).

⁴⁸ A classic review of how payment systems operate in Europe, Japan, and the United States can be found in Humphrey, Sato, Tsurumi, and Vesala (1996).

ed for banks to pay implicit interest on deposits in the form of reduced fees on checking (perhaps all the way to no service charge), increased convenience through the construction of branch offices in many locations, and other means of convincing customers to keep funds on deposit when explicit interest payments to these customers were either zero or below market. This led to a situation of cross-subsidies in general and overuse of checks in particular. Customers with high balances and fewer checks written were cross-subsidizing those with low balances and many checks written. There were few if any incentives to limit check writing.⁴⁹ At the same time, credit card pricing had created cross-subsidies as well. Credit card customers generate revenues for card-issuing banks in three ways: first, they pay interest on unpaid balances; second, they may pay an annual fee; and third, their transactions generate interchange revenue. Since interest is not charged to many customers who do not carry unpaid balances at the end of the billing cycle, these customers do not pay directly for the costs they generate by their credit card activity. In addition, at the point of sale the customer is not charged a different price for the goods or services depending on whether he or she chooses a low- or high-cost method of payment. Since the merchant pays a fee to the bank (the merchant discount) that is based on the size of the transaction and the customer does not benefit from using the low-cost transaction, the bank has an incentive to have a card transaction migrate to the bank credit card or the off-line debit card because the merchant discount paid to the bank is higher. Hence, there is no explicit pricing incentive for the customer to choose the lowest-cost method of making payment.⁵⁰

Although the regulation limiting interest payments on deposits was removed in 1980, there is still a perceived preference on the part of consumers for pricing arrangements that do not involve per-item charges for checks written.⁵¹ In the Federal Reserve payments project in 2002, it was noted that the number of checks written per household has increased over time, while the government and the business sector have made more progress in replacing checks with electronic pay-

ments.⁵² There is indirect evidence that pricing has an effect on decision making by business about checks versus electronic payments. First, most large and middle-size corporations actively manage their cash, and they invest all deposits on a daily (overnight) basis, usually through sweep arrangements. This may be construed as a market-based innovation to avoid the impact of the prohibition of interest payments on business demand deposits. Since banks must pay a competitive rate on these balances, they must charge fees that cover their costs of providing transaction services to these business customers. The Phoenix-Hecht and Treasury Strategies, Inc., surveys discussed above support the use of these cash management tools. In addition, Phoenix-Hecht conducts and publishes surveys on the prices of specific transaction services,⁵³ and the surveys of corporate cash management practices indicate that annual reviews (including of pricing) are common. Moreover, the corporate cash management community has worked to standardize formats for categories of services and procedures for designing requests for proposals (RFPs) for banks offering cash management services.⁵⁴ As indicated above, in their use of electronic banking services, middle-market corporations resemble larger corporations as banks refine their offerings and saturate the large corporate market. This migration process to smaller firms will increase the use of electronic banking for smaller corporations in the future.

If we accept that pricing incentives have caused businesses and governments to economize on high-cost methods of payment, is there any evi-

⁴⁹ The link between pricing, regulation, and electronic funds transfer is discussed in Murphy (1977).

⁵⁰ It should be noted that the *total* cost of making the transaction is important to the payer, including postal costs if the mails are involved as well as the time and transportation costs involved in making the transaction. The switch to electronic payments by consumers may reflect changes in the total cost even though the explicit transaction costs are not charged directly to them.

⁵¹ The Federal Reserve conducts an annual survey of retail fees of depository institutions. For a summary of the findings of these surveys, see Hannan (2002). See also Stavins (1999).

⁵² See Gerdes and Walton (2002).

⁵³ See Phoenix-Hecht (2003).

⁵⁴ See Association for Financial Professionals (2003, 2003).

dence that this would happen on the consumer side if explicit pricing were somehow introduced? There is very limited evidence, in those instances in which per-item pricing is observed for consumers in the United States, that it has the expected effect on check writing.⁵⁵ However, the most rigorous, thorough econometric examination of the effect of pricing on choice of payment instrument was conducted by Humphrey, Kim, and Vale for Norway, a country that implemented explicit per-item prices for a number of payment instruments used at the point of sale. The findings supported a strong substitution effect of electronic for paper transactions at the point of sale.⁵⁶

Implications for Banking Profitability and Regulatory Oversight

This review of the development of payment systems in the United States indicates the following:

- Banks will have to adapt their offerings and internal back-office processing to reflect the changes underway, leading to greater use of electronic banking by consumers. Fortunately, although the process of change has recently accelerated, the trends should not overwhelm the industry.
- Since more electronic transactions are cheaper to process, as is the conversion or truncation (or both) of checks, banks that do not explicitly charge for transaction services on a per-item basis will see a reduction in costs. For banks that have explicit fees for each service (mainly banks that supply cash management services), it will be necessary to ensure that the profit margins on the electronic transaction services are commensurate with those on the paper transaction services.
- Since cross-subsidization and implicit pricing lead to distortions, overuse of some services,

and lack of transparency, there is no justification for the remaining restriction on paying interest on demand deposits. Interest is allowed for consumer accounts, and large businesses have evaded the restriction by using sweep accounts. The Federal Reserve should pay interest on bank balances, and banks should not be restricted in paying interest on any demand deposit account.

- There has been and will continue to be consolidation in the provision of cash management services to large corporations, but banks of all sizes will be able to continue to serve their customers with a mix of capabilities, including ATMs, on- and off-line debit cards, credit cards, acting as receivers of ACH payments on behalf of their customers, and other services. There should be no reason to believe that these trends by themselves will have any substantial impact on the market structure of the banking industry.
- Bank regulators must concern themselves with operational risk. The developments discussed in this paper indicate that regulators must be aware of the risk implications of the changes in payment systems and must adapt their approaches accordingly.
- Regarding operational risk, one important aspect that must be considered by bank regulators is the trend toward nonbank ownership and operation of significant portions of the payment networks. Since the operation of these networks has a direct effect on the risk exposure of regulated banks, the risk management procedures of these firms may have significant implications for bank regulators.
- Banks and bank regulators need to be concerned about the market structure of the network providers, especially those for ATMs, debit cards, and credit cards. Significant consolidation among network providers has already occurred, and any further concentration raises concerns about pricing, service quality, and product innovation in this segment of the market, one in which bank regulators have no direct responsibility.

⁵⁵ See Murphy (1991).

⁵⁶ See Humphrey, Kim, and Vale (2002). Other studies of cross-country analyses of payments failed to find significant relationships between pricing and use because of poor data and little application of per-item pricing. See Humphrey, Pulley, and Vesala (1996).

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