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Abstract: We review how deregulation, technological advance, and increased competitive rivalry have affected the size and health of the U.S. community banking sector and the quality and availability of banking products and services. We then develop a simple theoretical framework for analyzing how these changes have affected the competitive viability of community banks. Empirical evidence presented in this paper is consistent with the model's prediction that regulatory and technological change has exposed community banks to intensified competition on the one hand, but on the other hand has left well-managed community banks with a potentially exploitable strategic position in the industry. We also offer an analysis of how the number and distribution of community banks may change in the future.

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In most developed countries, the majority of banks and savings institutions continue to be small and community-based. But advances in information technology, new financial instruments, innovations in bank production processes, deregulation, and increased competition have created a less hospitable environment for community banks. The number of community banks is shrinking in most countries, as are their shares of loan and deposit markets. For example, by some measures both the number and market share of community banks in the U.S. have approximately halved since 1980.

Given these trends, it is natural to wonder if the community bank business model will continue to be viable in the future. The specter of a declining, or perhaps a disappearing, community banking sector has potentially serious implications for the U.S. economy. Most obviously, the small business sector – an historically crucial source of innovation and new job creation – has traditionally relied on small local banks for credit.

This paper presents a comprehensive view of the community banking sector in the U.S. in three parts. Each of these three sections includes numerous citations to the recent academic literature, and each is supported by a variety of data from the U.S. banking industry. First, we review the past three decades of change in the U.S. banking system, with a special focus on how deregulation, technological advance, and increased competitive rivalry have affected the size and health of the community banking sector.

Second, we use a strategic map approach to develop a theory of how deregulation and technological change have affected the competitive viability of community banks. The theory suggests that regulatory and technological change has exposed community banks to intensified competition on one hand, but on the other hand has left well-managed community banks with a potentially exploitable strategic position in the industry. We show that data drawn from the U.S. banking industry over the past three decades are largely consistent with these characterizations.

Third, we consider the number of community banks that will remain viable in the future. Projecting the future number and size distribution of commercial banks after the U.S. banking industry

has fully adjusted to deregulation is a treacherous exercise, and we do not pretend to be able to make accurate point estimates. Rather, we consider the recent financial performance of community banks relative to large banks, and, based on straightforward market principles, suggest which types of community banks, and how many of each type, are most at risk and least at risk going forward. Of course, this approach leaves the ultimate questions unanswered – How many community banks will exist in the future? What will these community banks look like? Who will these community banks serve? – so we close with a discussion of useful areas for future research on community banks.

Although our analysis focuses on community banks in the U.S., our major findings about the effects of technology, deregulation, and competition on community banking are likely to hold for other developed nations as well. New information, communication, and financial technologies travel easily across geographic boundaries, and ongoing financial deregulation in Europe and Asia are similar in spirit to the recent deregulation of U.S. financial institutions and markets. However, our analysis may be less appropriate for banks in developing economies.¹

1. What is a community bank?

Before we can begin our analysis we need to define a community bank. Industry participants have little trouble distinguishing a community bank from, say, a regional bank or a money center bank. Based on their experiences, they can use an “I know one when I see one” test. But for someone trying to establish how community banks differ *en masse* from other types of commercial banks, establishing a definition of “community bank” is not an easy – and perhaps not even a fully solvable – proposition.

In practice, most research economists, industry analysts, and even some regulators simply establish an upper size threshold – typically around \$1 billion in bank assets – and refer to all banks lying below that threshold “community banks.” Although bank size may be the best single proxy for identifying a community bank, this uni-dimensional approach will fail to identify some large community banks and will misidentify some small non-community banks. Community banking is a complex phenomenon, and bank size is really just an instrument for identifying banks with a richer set of

characteristics. The following qualitative definition captures some of these characteristics: “A community bank is a financial institution that accepts deposits from and provides transactions services to local households and businesses, extends credit to local households and businesses, and uses the information it gleans in the course of providing these services as a comparative advantage over larger institutions.” We also find the following more applied definition useful: “A community bank holds a commercial bank or thrift charter; operates physical offices only within a limited geographic area; offers a variety of loans and checkable insured deposit accounts; and has a local focus that precludes its equity shares from trading in well-developed capital markets.”

Limited data availability restricts us from following either of these two definitions to the letter. However, we are able construct a multi-dimensional filter that employs a number of these definitional characteristics to identify community banks and separate them from non-community banks. For our purposes, a community bank (a) holds less than \$1 billion in assets (2001 dollars); (b) derives at least half its deposits from branches located in a single county;² (c) is domestically owned; (d) has a traditional product mix that includes portfolio lending, transactions services, and insured deposits; and (e) is either an independent bank, the sole bank in a one-bank holding company, or an affiliate in a multibank holding company (MBHC) comprised solely of other community banks. Further details of our data selection methods are included below.

2. That Was Then, This is Now

In this section we first take a look at the world of community banks in the U.S. in the 1970s. Then we examine the changes over the intervening decades that radically altered this world. As we will see, much of the impetus for change came from outside the banking industry. These external factors exposed the entire banking industry to new competitive forces that affected both the lending and deposit-taking sides of the balance sheet, and transformed the income statements of many banking companies as well. Fueled by innovation and deregulation the industry was dramatically transformed. In the process

the world of community banking has been redefined. We conclude this section with a look at community banking today – the new world of community banking.

2.1 An Idyllic World for Community Banks in the 1970s.

It is impossible to describe the U.S. commercial banking environment in the 1970s without first noting that it was very much a protected industry. Government regulations shielded the industry from geographic competition, from product competition and, at least on part of its business, from pricing competition. Indeed, banking – and particularly community banking – was a comfortable place to be.

Protection from geographic competition was anchored by The McFadden Act of 1927 that prohibited interstate branch banking. The only loophole in the McFadden Act was cross-border banking through multibank holding companies. However, exploitation of this loophole required state approval and not a single state in the 1970s permitted the out-of-state ownership of one of its banks by a multibank holding company.³ In addition to these interstate restrictions, most states imposed restrictions on intrastate branching. Some states at the time, most notably Illinois and Texas, prohibited any branching.^{4,5}

On the product dimension banks were insulated from competition from investment banks, insurance companies, and brokerage firms by the Glass-Steagall Act that effectively isolated commercial banking as a separate and highly regulated financial sector. Moreover, depository institutions such as savings and loans and credit unions were not permitted to compete with banks for their main line of business, commercial loans. On the deposit dimension, banks were prohibited throughout most of the 1970s from competing on interest rates by Regulation Q which imposed interest rate ceilings on all deposit rates except negotiable CDs above \$100,000.

By 1980 there were still 14,434 chartered commercial banks in the U.S., and 14,078 of these banks held less than \$1 billion (2001 dollars) of assets – as discussed above a standard crude definition of a community bank.⁶ By this measure, community banks represented 33.4 percent of the industry's assets. The banking industry was still the largest category of financial intermediary in the U.S. with over 35

percent of the nation's intermediated assets and when combined with thrifts (including credit unions), depository institutions as a whole had nearly 60 percent of intermediated assets.⁷ Nevertheless, Glass-Steagall assured that financial markets were quite segmented and that the business of banking was focused on offering deposits and loans. However, within these product categories, the banking industry was a major player and in some markets the dominant player. For example, the industry's deposit franchise made it the dominant provider of transactions services through checkable deposit accounts. Depository institutions were also a major provider of low risk relatively liquid investments (savings accounts) and low risk short- and intermediate-term investments (time deposit accounts). As a result depository institutions were an extremely important investment vehicle for consumers. This is reflected in Table 1 which shows consumer financial assets based on the Federal Reserve's Survey of Consumer Finance (SCF) in 1983, the first year this data was available. Lines 1, 3 and 4 are the fraction of total financial assets that consumers allocated to depository institutions. In 1983 consumers allocated 22.7 percent of their assets to depository institutions.

Another important feature of the 1970s deposit franchise was the fact that the payments system at the time was predominantly paper-based. In a banking world that emphasized brick and mortar delivery, community banks' enjoyed substantial market position because large commercial banks were constrained from competing in local markets. In states with limited or no branch banking this advantage was especially significant, because large banks simply could not branch into local markets. In addition, at least in the first half of the 1970s, ATM machines had not been widely adopted, thus further shielding local community banks from competition from larger banks.

With respect to lending, banks and thrifts were not the only players. However, loan markets were generally segmented and in some of these markets banks and thrifts were the dominant players. For example, at the beginning of the 1970s the residential mortgage market was mostly a banking and thrift market. Some residential mortgages were held by insurance companies and finance companies and some were held in securitized pools. These holdings, however, were relatively small compared to banks and thrifts. In particular the securitization market was still in its infancy and limited mostly to Ginnie Mae

passthroughs. Community banks were significant players in the residential mortgage markets at the close of the decade, allocating about 40 percent of their loan portfolio to real estate loans in 1980 (see Table A-5 in the Appendix).

Banks and thrifts competed with finance companies for consumer loans although, even here, there appears to have been considerable market segmentation. Consumer finance companies tended to attract the higher risk and subprime consumer borrowers while banks, thrifts and possibly captive auto finance companies (e.g., FMAC, GMAC) tended to attract the prime consumer borrower.⁸ Again, because of the extensive limitations on branch banking, community banks enjoyed an advantage in consumer lending over larger banks with their local market power. Community banks allocated about 30 percent of their loan portfolio to consumer loans in 1980 (see Table A-5).

Table 2 provides an overall picture of consumer debt from the perspective of the consumer. It shows the allocation of consumer debt by institution in 1983, the first year that this data was available. The data clearly show the importance of depository institutions in providing consumer finance. Consumers obtained 59.8 percent of their debt from depository institutions in 1983, much of it in the form of residential mortgages, with the remainder spread out among a number of different sources.

Commercial lending in the 1970s reflected some segmentation both across financial institutions and within the banking industry itself, although larger commercial banks made loans to business borrowers of all sizes. During most of the 1970s large commercial banks were still the major source of short-term financing to large businesses. Life insurance companies were also active in business finance but their activities were confined to longer term financing to medium-sized businesses and some large businesses. Small businesses are generally unable to get long term financing other than to finance specific fixed assets such as equipment and real estate (see Carey et al 1993). Community banks, constrained by legal lending limits, focused on lending to smaller businesses.⁹ Community banks allocated on average between 20 and 30 percent of their loan portfolio to commercial loans in 1980 (see Table A-5).

Banks, including community banks, faced some competition from commercial finance companies that were active in small and middle market commercial lending. Again, however, there was considerable segmentation. Commercial finance companies tended to focus on higher risk borrowers by providing asset-based loans or by factoring receivables.¹⁰ Asset-based loans are loans that are primarily based on collateral, specifically accounts receivable, inventory and equipment, that involve a high intensity monitoring technology. This monitoring can include daily submission of new invoices, collection of receivables through lock-box arrangements, daily calculation of loan availability, and periodic field audits conducted by the lender. Factoring involves the purchase of receivables by a financial intermediary usually without recourse.¹¹ Some large banks and some community banks provided asset-based lending and/or factoring but in the 1970s this segment of the market was mostly supplied by commercial finance companies including some large ones such as Commercial Credit, Walter Heller and Talcott. Not infrequently, however, banks including some community banks would participate with commercial finance companies with the understanding that if their borrower's risk profile improved in the future the commercial finance company would return its share of the loan to the bank.

2.2 Three Decades of Change

The idyllic world of community banking relied on a set of strict federal and state banking regulations that shielded local banks from outside competition, prevented the entry of nonbank financial institutions into traditional banking product markets (and vice versa), and prevented price competition among banks for transactions deposits. Volatile economic conditions, technological change, and an anti-regulation evolution in political and economic thought in the 1970s, 1980s, and 1990s led to the dismantling of these banking regulations, and brought an end to the comfort zone of community banks.

The 1970s: Volatile interest rates and the beginnings of technological change. In the late 1960s and early 1970s money market interest rates regularly exceeded the Regulation Q ceiling on interest rates. The gap became huge after the Federal Reserve changed monetary policy in 1979 with the 90 day

Treasury Bill rate at one point exceeding the passbook savings account ceiling by over 1000 basis points. As a consequence, disintermediation became a problem for the banking industry in the late 1970s, as deposits flowed out of low-yielding bank deposits and into higher yielding investments offered by nonbank institutions not constrained by Regulation Q. Community banks and thrifts were more dependent on retail deposits and less dependent on large denomination CDs than large banks. As shown in Table A-5, large banks relied on large denomination deposits for over 30 percent of their funding in 1980 while large, medium and small community banks relied on this source for only 20 percent, 15 percent and 9 percent respectively. Thus, the potential threat from disintermediation was arguably more acute for these smaller institutions because they were more dependent on the types of deposits that were generally constrained by Regulation Q ceilings.

The threat from disintermediation in the late 1970s was much more serious than it was when interest rates spiked earlier in the decade when retail customers had few alternatives to bank deposits for liquid investments. The minimum denominations on money market instruments such as negotiable CDs and commercial paper were too high for the small investor. However, money market mutual fund (MMMF)s, a monumentally important financial innovation first introduced in 1971, would inalterably change the financial landscape in the U.S. MMMFs combined two features that gave them a big competitive advantage over Regulation Q-constrained bank deposits: 1) money market investment returns and 2) checkability. Later in the decade Merrill Lynch took this innovation one step further with its Cash Management Account by adding a third dimension, a brokerage account. In the mid-1970s market interest rates receded some and as a result the flow of funds into MMMFs did not reach a level that threatened the banking industry's deposit franchise, but in the late-1970s MMMFs once again began to grow dramatically. Moreover, innovations elsewhere in the financial services sector created even more alternatives to bank deposits such as the universal life insurance policy. Universal life combined term life insurance with a money market-linked savings component. The impact on banks and thrifts was acute.

Other innovations had an equally powerful impact on retail banking. One of the most important was the Automated Teller Machine (ATM), which had an impact on both the cost (cheaper to produce)

and the quality (limited options, but more convenient) of transactions services. Banks had initially hoped that the ATM, as its name implies, would be a substitute for human tellers, and by extension perhaps even a partial substitute for bank branches. However, as seen in Figure 1, as the number of ATMs has increased, so has the number of bank branches. These data suggest a number of important strategic roles for bank delivery systems, e.g., increased customer convenience, revenue generation via third-party ATM fees, person-to-person contact with customers at brick-and-mortar branches.

Other alternatives to brick and mortar banking began to appear after the ATM. Some banks began offering pre-Internet retail computer banking in the 1980s where customers with a computer and modem could pay bills and transfer money between accounts over telephone lines. Credit cards and debit cards expanded rapidly in the 1970s and 1980s represented yet another alternative to the traditional bank delivery system.¹²

The 1980s: Regulatory reaction and further technological innovation. During the 1980s it became increasingly difficult to maintain a regulatory environment that could protect the banking industry from product competition, interregional competition and interest rate competition – and at the same time insure a vibrant and healthy banking industry. Market conditions and financial and technological innovation simply conspired against preservation of the old regime. Regulatory change became inevitable and necessary to rationalize the new reality.

On some dimensions this change came quickly. For example, the huge spike in interest rates beginning in 1979 led to the relatively rapid legislative dismantling of Regulation Q that culminated with the passage of the Garn-St. Germain Depository Institutions Act in 1982. This Act also allowed, among other things, for thrift institutions to compete directly with community banks by making commercial loans.

Next came the dismantling of the McFadden Act both at the intrastate and the interstate levels. This process took more time than the dismantling of Regulation Q, but its effect was nevertheless equally dramatic. At the intrastate level 32 states liberalized their in-state geographic restrictions on banking

between 1980 and 1994.¹³ At the interstate level, regulatory reform began in the early 1980s with state legislative initiatives to exploit the multibank holding company loophole in the McFadden Act. States entered into reciprocity agreements where participating states agreed to allow cross-border bank ownership through multibank holding companies. By the end of the decade, all but six states allowed some sort of interstate banking with most being part of large regional pacts (Berger, Kashyap and Scalise 1995).

Like geographic liberalization, expansion of banking powers occurred somewhat more incrementally than interest rate liberalization. Nevertheless, after two decades the result was the same: a substantial elimination of most barriers. On the retail side, the first major change was arguably the creation of the money market deposit account (MMDA) by the Garn-St. Germain Act in 1982. MMDAs gave banks a vehicle to compete directly with MMMFs. Until the end of the 1990s most of the other changes were facilitated by Federal Reserve Board rulings. The Federal Reserve was given the authority under the 1956 Bank Holding Company Act and the 1970 Amendments to the Act to determine what activities could be conducted by banking organizations subject to the condition that these activities are “closely related to banking”. This and additional legislation imposed some fairly strict limitations on some product lines such as insurance. Although even here, state chartered banks were able to exploit some state-level opportunities for regulatory arbitrage. Delaware, for example, offered the opportunity for large bank holding companies to established state-chartered subsidiaries with their own insurance affiliates.¹⁴

Banks challenged these restrictions on a wide variety of fronts including municipal bond underwriting, commercial paper underwriting, discount brokerage, managing and advising open- and closed-end mutual funds, and underwriting mortgage-backed securities. On some challenges banks were successful and on some they were not, with many of the challenges being adjudicated in the courts with opposition of trade groups such as the Securities Industry Association. Then in 1987 the Federal Reserve allowed banks to form investment banking subsidiaries (i.e., Section 20 subsidiaries) and in 1989 the

Federal Reserve granted limited corporate securities underwriting privileges to a select group of banks. The limitations and the number of authorized banks increased in the following years.

Not only did innovation conspire to drive changes in the regulation of the financial services industry, it also fundamentally changed the nature of many aspects of the business of banking beyond just the ATM machine discussed above. This is not entirely surprising given that banking is the most IT-intensive industry in the U.S. as measured by the ratio of computer equipment and software to value added (Triplett and Bosworth 2002, Table 2).

One of the most dramatic examples of innovation was securitization. Unlike the changes just discussed that involved the government getting out of the way (i.e., the dismantling of Regulation Q, McFadden, and Glass Steagall), securitization is a story about government intervention right from the beginning. Securitization began in the 1960s with the creation of the Ginnie Mae passthrough and exploded in the 1980s with the development of the collateralized mortgage obligation. Securitization was an innovation that had both a financial and a technological component. On the financial dimension, securitization involved the synthetic creation of a liquid traded security from a pool of illiquid nontraded assets where often the payoff characteristics are altered significantly from those of the underlying assets. Securitization also had an important technological component as new information technology allowed for the efficient compilation, computation and dissemination of information related to the performance and operation of the asset pools. Securitization spread from the residential mortgage market to many other types of financial assets including consumer loans and accounts receivable. Since the 1970s the growth in securitization has been phenomenal with the stock of asset-based securities growing from several hundred billion dollars to almost \$4.5 trillion in 2001. This is almost as big as the entire assets of the banking industry (\$5.7 trillion) (Berger 2003). Securitization has also become an important tool for community banks to geographically diversify their otherwise locally-concentrated loan portfolios.

An important feature of the securitization market today is the role of two government-sponsored enterprises (GSEs), the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac), in the residential. At year-end 2000, investors held \$1.2 trillion of

mortgages securitized by Fannie Mae and Freddie Mac. In addition, Fannie Mae and Freddie Mac held another \$1 trillion dollars of mortgages and mortgage-backed securities directly in their own portfolios (Passmore, Sparks and Ingpen 2001).

Fannie Mae and Freddie Mac receive an “implicit” government subsidy because investors treat their debt as if it were backed by a guarantee of the U.S. government. A key public policy issue is whether this government subsidy affects the competitive structure of the residential mortgage market. The evidence suggests that Fannie Mae’s and Freddie Mac’s policies have slightly lowered residential mortgage rates (due to the implicit GSE subsidies) and as a result have encouraged a housing stock that is inefficiently large (e.g., Hendershott and Shilling 1989, ICF 1990, Cotterman and Pearce 1996, Passmore, Sparks and Ingpen 2001, White 2003).¹⁵

Technology has also had an impact on consumer and micro business lending in terms of the increasing dependency of these types of lending on credit scoring. First introduced in the 1950s credit scoring has become widely used in consumer and mortgage lending over the past 30 years (Mester 1997). According to the Federal Reserve’s 1996 Senior Loan Officer Survey, those banks that use credit scoring in their credit card business virtually always use it in approving applications. About 80 percent of those who use credit scoring also use it in determining from whom to solicit applications, and about 20 percent use it in setting loan terms. The type of model employed will depend on how it is used. Banks increasingly rely on “bureau scores” to solicit and pre-screen applicants. Bureau scores are credit scores based solely on the history of individuals as reflected in credit bureau reports as opposed to “application scores” that weigh other factors (e.g., income, employment) in addition to credit bureau information (Avery, Bostic, Calem and Canner 1999).

Given the paucity of research in this area, it is difficult to quantify the economic impact of credit scoring on the consumer loan market. For example, we are not aware of any rigorous study that has examined the improvement in the power of credit scoring since the 1970s. From a statistical standpoint, the methodology used today (i.e., regression, logit and discriminant analysis) was generally available in the 1970s. Computational costs are certainly lower today and the data sets are certainly better. However,

in the absence of hard empirical evidence, it is not obvious the extent to which these factors would have been sufficient to drive an economically meaningful improvement in the predictive power of the models since the 1970s. More fundamentally, it is still an open question whether credit scoring does a better job of risk assessment than human analysis and by how much. There does not appear to be sufficient definitive research on this.¹⁶ It does seem safe to assert, however, that credit scoring has significantly reduced the unit cost of underwriting an individual consumer loan, and as a result has increased the efficient size of consumer loan underwriting operations. It is quite possible that the benefits from credit scoring are dominated by these cost saving and scale effects.

The 1990s: Industry consolidation, nationwide financial services markets, and widespread adoption of new banking technology. Banking industry deregulation reached its zenith during the 1990s. In 1994 Congress rationalized the patchwork of state-by-state geographic rules by passing the Riegle-Neal Interstate Banking and Branching Efficiency Act which effectively repealed the McFadden Act. The immediate response was the highest-ever five-year run of bank mergers in U.S. history, in terms of both the number and the value of the banks acquired (Berger, Buch, DeLong, and DeYoung forthcoming). Only a relatively small number of these M&As were ‘megamergers’ (i.e., combinations of two banks each with over \$1 billion in assets). The majority of mergers were between two community banks, and in the vast majority of mergers the merger target was a community bank (DeYoung and Hunter 2003).

Feeling pressure from a series of rulings by the Office of the Comptroller of the Currency that granted increased product powers to national banks, and an announced merger between the largest bank in the U.S. and one of the world’s largest insurance companies (CitiBank and Travelers), Congress followed nationwide geographic deregulation with broad-based deregulation of banking powers. Specifically, in 1999 Congress passed the Graham-Leach-Bliley Act which effectively repealed the Glass-Steagall Act.

These congressional acts ratified the decades-long deregulation movement, and as such they marked the culmination of story lines that began in the 1970s and 1980s. But the true breaking story of the 1990s was the widespread adoption of new financial and information technologies by almost all U.S.

banks. These technologies have been applied differently by, and had different strategic and competitive implications for, large banks and small banks.

In the 1990s credit scoring was adopted by many large banks in their micro business lending. Banks have different definitions for this class of lending but the ceiling loan size generally lies between \$100,000 and \$250,000. Some banks have used their own proprietary models and others have purchased credit scoring models from outside vendors. In general these models rely on information about the entrepreneur (e.g., credit bureau reports), mercantile credit information from third party information exchanges (e.g., Dun and Bradstreet), as well as firm specific information.¹⁷ Recent research indicates that this technology has been associated with an increase in overall lending and that it has enabled banks to reach a more marginal class of borrowers. This seems to be particularly true when banks use automated acceptance/rejection and pricing decisions based on credit scores rather than more discretionary decisionmaking where credit scoring is not the only input. These results could obtain even if micro-business credit scoring was no better at predicting failure (or even worse) but significantly less expensive than human due diligence (Frame, Srinivasan, and Woolsey 2001, Berger, Frame and Miller 2002).¹⁸

Information and financial technology has also likely lowered the cost and increased the quality of third party information exchange, although hard empirical evidence on this is lacking. Research on the effectiveness of exchange information at the macro level indicates that in countries that have either private exchanges or public credit registries interest rates and economic growth are higher (Jappelli and Pagano 1999). Certainly, on both the consumer side (credit bureaus) and on the business side (mercantile credit information exchanges such as Dun and Bradstreet) the data bases have grown significantly. The delivery system has also changed. Credit reports and D&B reports can now be sent instantly over the Internet. As a result lenders can promise quicker turnaround on credit applications which is important in consumer lending and micro-business lending.

Financial technology has also had a significant effect on how banks manage risk. After the run-up in interest rates in the 1970s caught many banks with an asset-liability miss-match, the banking

industry began to adopt interest rate risk management techniques to measure their interest rate exposure. These began with simple GAP-based programs and later evolved into more sophisticated duration-based programs.¹⁹ Advances in financial engineering and the development of new and wider derivatives markets had a very positive effect on the ability of banks to implement interest rate risk management strategies. Following some highly visible financial fiascos including Barings PLC, Orange County and Metallgesellschaft, banks began to implement market risk management tools to measure and manage their trading risk in the mid-1990s. In the latter half of the 1990s banks began to adopt similar value-at-risk based tools for managing credit risk.²⁰ The proposed new Basle Capital Accord takes this one step further using these new credit tools in linking capital requirements to credit risk. An important aspect of all of these initiatives is the heightened demands they have placed -- and will place in the future under the new Basle Capital Accord -- on information technology. Banks who opt for the advanced version of the new Basle capital requirements, for example, will be required to estimate the probability of default (the "PDs") and the likely loss given default (the "LGDs") on all of their loan portfolios over the business cycle (Basle Committee 2002).²¹

It is quite possible that the biggest impact of technology on the banking system may have been on the payments system. Over the past three decades electronic payments technologies have been implemented that involve transferring funds electronically with little paperwork.²² One study, for example, found that the number of checks paid during the second half of the 1990s was falling at a rate of about 3 percent per year while credit card payments and debit card payments were increasing during this period by 7.3 percent per year and 35.6 percent per year respectively (Gerdes and Walton 2002, Table 2). These results indicate that the share of payments by checks to total payments (payments by checks plus credit cards plus debit cards) fell from 80.8 percent to 64.6 percent. Another study found that while check use overall continued to rise modestly in the 1990s, it fell dramatically in retail payments (Humphrey 2002). Data in this study also indicate that the share of check payments has been falling - over the ten years from 1990 to 2000 the share of payments by check to total payments has fallen from 87.8 percent to 72.3 percent.

The technology-driven switch from paper-based payments to electronic-based payments is also reflected in the steep increase in the use of the automated clearing house (ACH). This system is used for regular payments such as monthly mortgages, direct deposits, etc. ACH volume handled by the Federal Reserve increased at a 14.2 percent annual rate from 1990 to 2000 (Berger 2003). The impact on cost reduction for ACH payments was dramatic. Over the 1990-2000 interval the cost declined in real 1994 dollars from \$0.959 to \$0.158, a reduction of 83 percent (Berger 2003). Reductions in the cost of processing electronic payments has generally been greater than cost reductions from technology in processing checks and cash payments where the reductions have been more modest (Bauer and Ferrier 1996, Bohn, Hancock, and Bauer 2001, Gilbert, Wheelock, and Wilson 2002).

Internet banking has been a more recent effect of technology on the banking industry. It is changing the landscape of the financial services industry by reducing the importance of geography and reducing the cost of transactions. Banks today offer Internet services in a wide variety of forms including full transaction sites that allow customers to make deposit and loan transactions on line. Most banks employ a “click and mortar” distribution model that combines a transactional Internet site with their traditional brick-and-mortar offices and/or ATM networks. In its most extreme form, there are a relatively small number of Internet-only banks that offer their services exclusively on the Internet. As of July 2002 there were just 20 such Internet-only operations. Approximately another dozen Internet-only institutions have failed, been acquired or voluntarily liquidated, and in addition several large banks integrated their Internet-only units into the main bank after poor stand-alone performance.²³ Figure 1 suggests a complementarity among all types of bank distribution channels. All three major distributional channels – ATM machines, bank branches, and transactional Internet banking websites – have increased over time.

In general, however, Internet banking has become widespread in its “click-and-mortar” form. It appears that a substantial majority of banks have at least an informational website and close to a majority now offer transactional Internet sites with virtually all large banks offering them (Furst, Lang, and Nolle 2001, 2002, Sullivan 2001, Berger 2003). Because the basic Internet banking transaction has low variable

costs, there are economies of scale associated with this production process and distribution channel (DeYoung forthcoming). However, this does not preclude community banks from offering this technology, because they can outsource both the development and the maintenance of their Internet sites to website vendors. There is some evidence to indicate that banks, except for the smallest, that have adopted Internet services are more profitable than those that have not. However, this likely reflects the type of banks that have chosen the technology rather than the technology itself given that Internet banking is still a small contributor to overall bank output for most banks (Furst, Lang, and Nolle 2001, 2002, Berger 2003). The evidence also suggests that the performance of Internet-only bank start-ups was inferior to traditional de novo bank start-ups, although the former appear to be improving faster than other banks suggesting that they gain scale and as they ride the learning curve of this technology (DeYoung forthcoming).

Overall, the increased efficiency that results from a shift from paper-based to electronic-payments should reduce the amount of transactions balances required by consumers. The data reflected in Table 1 appear to be consistent with such an effect. Over past two decades consumers have reduced the fraction of their financial assets allocated to transactions accounts, from 7.3 percent in 1983 to 4.6 percent in 2001.

Moreover, the increased efficiency that results from a shift from full service head offices to more specialized delivery channels (branches, ATMs, websites) should reduce the number of inputs that banks require to produce a given amount of banking services. The data displayed in Figures 2, 3, and 4 are consistent with this notion. The number of offices (bank branches plus the head office) per bank has nearly quadrupled since 1970, while assets per office, deposits per office, and transactions per office have steadily increased, and FTEs per office has declined.

In general it appears that larger banks have been quicker to adopt new technology than smaller banks. They have generally been the first, for example, to adopt electronic payments technologies, transactional websites, small business credit scoring (Berger 2003), ATMs (Hannan and McDowell 1984), securitization and off-balance sheet activities (Berger and Udell 1993). In addition to bank size,

however, other factors such market competition and concentration play a role in the adoption of banking technologies (e.g., Hanna and McDowell 1984, Akhavein, Frame and White 2001, Courchane, Nickerson, and Sullivan 2002, Gowrisandaran and Stavins 2002, Hauswald and Marquez forthcoming).²⁴

2.3 A Competitive and Rivalrous World for Community Banks in the 2000s

Where does all this change in the banking industry leave the community bank today? In the 1970s community banks arguably had an advantage in a number of different areas. Much of this advantage stemmed from their local monopoly power. This was particularly true in those states that had some restriction on state-wide branching – which was a majority of the states in the 1970s. For many consumers community banks were the portal to the payments system. They also played an important role as an investment vehicle for consumers. In addition, community banks were a primary source of consumer finance. Finally, community banks were the key provider of services to small businesses. However, the overall role of community banks and the role they play in many of these markets is quite different today for several reasons.

First, due primarily to thousands of mergers involving community banks in the aftermath of industry deregulation, there are simply fewer community banks today. The number of banks in the U.S. with assets less than \$1 billion (2001 dollars) has declined from 14,078 banks at the end of 1980 to just 7,631 banks at the end of 2001, and the share of industry assets held by these small banks fell from 33.4 percent to just 16.0 percent. This approximate halving of the presence of community banks in the U.S. banking industry occurred despite the birth of 4,336 de novo banks during the same time period.²⁵

Second, the revolution in payments technology that we discussed above has disadvantaged community banks relative to large banks. The payments system has become much more electronic, diminishing the importance of location. Alternatives to the checking account such as debit cards and credit cards have reduced the need for bank transactions balances that have historically given community banks a funding advantage. However, this does not mean that banks – large and small – will not pursue location for strategic purposes, as we shall discuss below.

Third, all depository institutions – not just community banks – have also become less important as an investment option for consumers. As we just noted, increased efficiency in the payments system has decreased the need for transactions accounts. But, in addition, the proliferation of investment options over the past three decades has diminished the relative attraction of savings accounts and certificates of deposit as consumer investment vehicles. This shift is reflected in Table 1. Ideally we would like to compare consumer financial assets in 1970, the year before the introduction of money market mutual funds, with the situation today. By the end of 1982 when money market mutual funds broke through the \$200 billion level, their impact was already enormous. However, as we noted above the SCF was first conducted in 1983, so 1983 is the earliest date available to examine consumer balance sheets. Nevertheless, Table 1 shows quite dramatically how much the role banking has changed in terms of the allocation of consumer assets – even after 1983. The fraction of total financial assets that consumers allocated to depository institutions (lines 1, 3 and 4) dropped from 22.7 percent in 1983 to 10.3 percent in 2001.²⁶

This issue of whether the role of the banking industry has declined has been a visible topic in the literature. Typically the analysis has centered around the fraction of all intermediated assets that are held by depository institutions (e.g., Boyd and Gertler 1994), fraction of total debt (e.g., Berger, Kashyap and Scalise 1995), banking industry employment (e.g., Berger, Kashyap and Scalise 1995) or bank profitability (Gorton and Rosen 1995). The problem with the metrics used in these studies is that they do not focus on specific banking activities where banks are believed to have had an advantage over other financial intermediaries nor are these particularly good measures of the level of bank activity.²⁷ The measure used here in Table 1, allocation of consumer assets to depository institutions is focused on a very specific activity and the metric is based on the users of the service (consumers) rather than the providers (depository institutions). Based on this metric it appears that banks overall have significantly lost part of their franchise value. The impact on community banks was arguably greater than the impact on larger banks because part of community banks' comparative advantage prior to the repeal of McFadden was the delivery of transactions services.

Fourth, there has been a breathtaking amount of commoditization on the lending side of banking fueled by both technology and government intervention. As we noted above, today the residential mortgage market is a securitized market in which government-sponsored enterprises (GSEs) like Fannie Mae and Freddie Mac are the driving force. The student loan market and substantial chunks of other consumer loan markets have likewise been securitized. Like other financial and nonfinancial commodities (where pricing power is nonexistent), returns to production depend on achieving large scale, and as a result community banks have virtually dropped out of credit card lending and no longer dominate mortgage or auto lending. This is illustrated clearly in Table A-1. In 2001, the typical large bank invested 7.39 percent of its loan portfolios in credit card loans; securitized 19.57 percent of its assets; and earned 4.36 percent of its noninterest income from loan securitization fees. In contrast, these figures were all less than 1 percent for the typical community bank.

The commoditization of mortgage, auto, and credit card lending can also be seen on the liability side of the consumer balance sheet. Between 1983 and 1997, debt owed to depository institutions fell from 59.8 percent to 45.7 percent of total consumer debt, while debt owed to mortgage and real estate lenders – whose business model is based entirely on securitization – increased from 11.6 percent to 38.0 percent of total consumer debt (see Table 2). It should be noted that much of the debt extended by mortgage and real estate lenders winds up back on bank balance sheets. This will occur when a mortgage lender sells a mortgage to a securitized pool and the bank purchases the securitized mortgage. Nevertheless, even if 100 percent of this paper ended up as bank investments, this would still reflect a significant loss to most banking franchises, because mortgage lenders would have captured a substantial amount of the loan origination business from depository institutions. Moreover, the existence of a secondary market where mortgage lenders can sell their originations has likely sapped much of the pricing power out of the residential mortgage market. Of course it has also enormously benefited consumers by transforming illiquid residential mortgages into highly liked traded securities.²⁸

Fifth, as a direct result of deregulation and new technologies in lending, payments, and financial markets, both large banks and community banks now face much more competitive pressure. The Gramm-

Leach-Bliley Act eliminated the barriers that had protected commercial banks, investment banks, brokerage houses, and insurance companies from competition with each other, and the Riegle-Neal Act exposed both large and community banks to entry from outside their local markets. The combined effect of the latter of these two federal laws and earlier interstate compacts has been a near 50 percent reduction in the number of commercial banks in the U.S. since 1980, and an increase in market share of the ten largest bank holding companies from 28 percent of U.S. banking assets in 1986 to 76 percent of U.S. banking assets in 2001.²⁹ Increased geographic competition has upsides for society – for instance, entry by large banks into previously protected local banking markets creates pressure for local banks to operate more efficiently (see DeYoung, Hasan, and Kirchhoff 1998; Evanoff and Ors 2001; and Whalen 2001) – but has obvious downsides for marginally profitable banks that cannot respond to the competitive challenge. Advances in information technology have made financial markets deeper and broader, making direct finance (equities, high-yield bonds, commercial paper) more accessible for entire classes of business borrowers that used to be captive customers of the commercial banking sector. Similarly, advances in electronic payments are reducing the value of the banking franchise as nonbanks (e.g., credit card networks) play an increasingly important role in the payments system. Finally, credit scoring and securitization have transformed the consumer loan production process from a relatively noncompetitive relationship business to a highly competitive, commoditized transactions business.

2.4 A Continuing Comparative Advantage for Community Banks

There is at least one area of banking that appears to have been relatively unaffected by technology and deregulation – relationship lending to small business. There are a number of reasons why this line of business may be relatively unassailable by competition from large banks wielding the latest in new information and financial technologies. In relationship lending information is gathered by lenders beyond the relatively transparent data available from financial statements, observation of collateral, and other public sources. This information is acquired over time by lenders through the breadth and depth of the

banking relationship and is used in renewing loans, extending additional credit, renegotiation, and setting loan terms.³⁰

In the relationship lending segment of the market it is not obvious that technology has had an economically significant impact on the way loans are underwritten and monitored. Some might argue that computers and communications technology have fundamentally changed the nature of loan underwriting.³¹ The reality, however, may be quite different. For relationship loans in the \$250,000 to \$15,000,000 range to informationally opaque business borrowers, the fundamental importance of the borrower-loan officer relationship has not likely changed that much in past three decades.³² Loan officers still emphasize the critical importance of personal contact with borrowers and other dimensions of “soft information”.³³

Even with respect to the component of underwriting that is based on “hard information,” the financial tools to assess credit quality are not much different today than they were in the 1970s. Leverage ratios, coverage ratios, turnover ratios, and profitability ratios are the same today as they were in 1970s. Computer spread sheet software makes it a little easier to calculate these ratios, but a good credit analyst in the mid-seventies could spread a set of financial statements relatively quickly (i.e., minutes not hours), so the economic impact here is likely minimal. As we noted above, information generated by third party information exchanges (e.g., Dun and Bradstreet), may be somewhat better. However, on any company borrowing above \$250,000, mercantile credit information in the 1970s was generally available, widely used by commercial lenders, and generally considered by lenders to be quite informative. In addition, credit scoring which uses trade credit exchange information as an input is not the primary lending criteria on loans of this size. The delivery of credit reports is much faster today as we have noted. However, this is much less important for loans above \$250,000 where credit approval is rarely made overnight given the emphasis on personal contact by the loan officer. And finally, the process of negotiation and the contracting tools available today (collateral, maturity, covenants, guarantees, subordination etc) are identical to the tools available in the 1970s.

Not all small business loans are primarily relationship-based. For example, about 50 percent of all small business loans are held by large banks (Strahan and Weston, 1998), but many of these loans are the credit-scored micro-business loans that we discussed earlier. Also, the asset-based lending and factoring that we discussed earlier are not relationship-based.³⁴ Finally, some small business lending involves extending credit primarily based on the strength of the financial statements. These would be businesses whose financial statements are stronger and more informative, and possibly larger and older.³⁵ Micro-business lending, asset-based lending (including factoring), and financial statement lending are all primarily based on “hard information” as described above. For these loans “soft information” is subordinate in importance. Soft information would include qualitative information about the character of the entrepreneur and the strength of the company culled from the interaction of loan officer with the entrepreneur, the entrepreneur’s suppliers, the entrepreneur’s customers, community activities, etc. However, for relationship loans soft information is of primary importance and hard information is less important in great part because there is less of it for these loans.

Some recent theoretical work finds that community banks may have an advantage in processing soft information and extending relationship loans. The basic argument here is that there are organizational diseconomies that make it problematic for larger institutions to process and communicate this information (Stein 2002). Empirical evidence seems to support this view including research that suggests that the contract terms of business lending at large banks are different than at small banks (Berger and Udell 1996), that small banks are more likely to base loans on soft information and the strength of the relationship (Cole, Goldberg and White forthcoming, Berger, Miller, Petersen, Rajan and Stein 2002, Scott 2004), and that large banks tend to lend at a longer distance where hard information more likely trumps soft information (Berger, Miller, Petersen, Rajan and Stein 2002).³⁶ Also, there is compelling evidence that small business lending in general (possibly excluding credit-scored micro-business lending) is not likely to become commoditized like residential mortgage lending and consumer lending. Specifically, despite the explosion of securitization in other markets, there has not been an economically meaningful level of securitization in the small business loan market (Acs 1999). In part,

this may be due to the high frequency of renegotiation and the intensity of monitoring associated with small business lending that could be problematic in a securitization environment.^{37,38}

3. A Strategic Analysis of Community Bank Performance and Viability

In this section we model the impacts that deregulation, technological change, and increased competition have had on the viability of community banks. We adapt a strategic-map framework from DeYoung (2000) and DeYoung and Hunter (2003), and we test the theoretical framework against financial and structural data for U.S. commercial banks from the mid-1970s through 2001. We find considerable empirical evidence consistent with the theoretical framework. The results of our analysis indicate that while deregulation and technological change created sobering competitive threats for community banks, the manner in which large banks have responded to these changes has left well-run community banks with long-run strategic opportunities.

3.1 A strategic map of the banking industry

In Section 2 we described a myriad of ways that deregulation and technological change have changed the competitive environment for community banks. At the risk of over-simplification, we will describe the strategic impact of these phenomena using just three basic parameters: bank size, bank unit costs, and product differentiation. Following DeYoung (2000) and DeYoung and Hunter (2003), we use these three parameters to construct the strategic maps displayed in Figures 5 through 8.

The vertical dimension in these maps measures bank size, with large banks at the bottom and small banks at the top. Because the production of banking services tends to exhibit scale economies, the vertical dimension also measures unit costs, with low unit costs at the bottom and high unit costs at the top. The earliest banking scale economy studies concluded that scale economies were fully exhausted by relatively small banks; most of these studies estimated minimum efficient scale for banks to be less than \$1 billion of assets (2001 dollars). More recent studies have yielded somewhat different insights; many of these studies conclude that scale economies are available for large regional and super-regional banks.³⁹

Part of this difference between these two sets of studies is due to the inferior (though state-of-the-art at that time) methodologies used by the earlier studies, and part of the difference is due to the fact that new information and financial technology changed bank production processes over time.

Regardless, an important point of agreement among most of these studies is that small banks using a traditional banking model (i.e., intermediating transactions deposits into loans held-on-portfolio) can gain substantial reductions in their unit costs without fully exploiting all available scale economies. Of course, as banks continue to grow larger, they will gain access to additional reductions in unit costs, albeit at a declining rate. But the degree to which a bank can reduce its unit costs via additional growth depends not just on its current size, but can also depend on the type of products it produces. Rossi (1998) shows that unit cost reductions at financial institutions doing less traditional banking (e.g., high volume origination and securitization of mortgage loans or credit card loans) continue to be substantial even at very large scale; this precludes community banks from profitably pursuing specialized strategies in financial commodities.

The horizontal dimension in these maps measures the degree to which banks differentiate their products and services from those of their closest competitors. Banks that offer differentiated products and services (e.g., customized loan contracts, personalized private banking) are located on the right, and banks that offer nondifferentiated products and services (e.g., standardized mortgage loans, discount online brokerage) are located on the left. Note that not all product differentiation is tangible – it can often be a perception in the mind of the customer. For example, community banks attempt to differentiate themselves by knowing the names of their customers upon sight, large banks attempt to differentiate themselves using marketing campaigns to create brand images for otherwise undifferentiated products, and if successfully deployed both of these strategies can support higher prices for retail banking services.⁴⁰

The horizontal dimension of standardization versus customization is also consistent with the distinction between hard and soft information discussed above (Stein 2002; Berger, Miller, Petersen, Rajan, and Stein 2002, Scott 2004). This spectrum runs from hard information on the left where banks

use automated transaction lending technologies to originate and securitize standardized mortgage or credit card loans and to deliver credit scored micro-business loans. Moving to the right banks emphasize more traditional lending technologies such as asset-based lending and financial statement lending. Finally, at the far right banks specialize in relationship lending where loan officers acquire soft information about the borrower over time, through a variety of products and services, and through interaction with the local community.

In this framework, banks select their business strategies by combining a high or low level of unit costs with a high or low degree of product differentiation. The positions of the circles indicate the business strategies selected by banks, and the relative size of the circles indicate the relative sizes of the banks. Figure 5 illustrates the commercial banking industry prior to the deregulation and technological advances we discussed above in Section 2. All banks were clustered near the northeast corner of the strategy space. Geographic regulation restricted the size of banks and prevented most (and perhaps all) of them from fully exploiting available scale economies. The available technology for producing and delivering banking services required interpersonal contact between loan officers and borrowers to collect soft information; paper-based transactions for payments; and visits to the bank to receive cash and deposit checks – all of which required brick-and-mortar bank and branch locations staffed by bank employees. The level of price competition on the deposit side was restricted on one hand by Regulation Q, and on the other hand by the lack of substitute liquidity and transactions providers. Retail competition, to the extent that it existed, was non-price competition – person-to-person service, the convenience of having a branch nearby, and of course free toasters for opening accounts – rather than price competition. And banks faced relatively little competition from nonbanks or securities markets for supplying credit to businesses.

The characteristics of retail, small business, and (to a large extent) large business banking varied little across different sized banks. Small banks tended to offer a somewhat higher degree of person-to-person interaction with retail customers, and large commercial accounts by necessity went to large banks, but small banks and large banks had more commonalities than differences with each other. For the most

part, there was a single retail banking strategy – with some variants – and very little strategic difference among most banks’ approaches to commercial lending.

But deregulation and technological advances created new strategic opportunities for banks, and as competition heated up banks had incentives to pursue those opportunities. As discussed above, the average size of commercial banks began to increase – at first due to modest within-market mergers, and then more rapidly due to market extension megamergers – and the disparity in bank size within the industry also increased.⁴¹ Although increased size yielded scale economies for small, medium, and large banks, the largest banks gained access to the lowest unit cost structures.

Large banks also became less like community banks because the size of their operations allowed them to more efficiently apply the new production technologies discussed above (e.g., automated underwriting, securitization, widespread ATM networks, electronic payments). This had two effects. First, it reduced their unit costs even further. Second, it changed their retail banking strategy to a high-volume, low-cost, “financial commodity” strategy. Home mortgages, credit cards, and online brokerage are three examples of financial services that have become dominated by large and very large financial institutions, which use hard information and automated production and distribution processes to deliver these services at low unit costs. Because price competition is strong for nondifferentiated products, pricing pressure keeps margins low, despite these banks low unit costs. High volumes, constant vigilance to keep expenses in line, and continuous innovation are essential for this strategy to earn satisfactory returns for shareholders.

Thus, the incentives created by technology and deregulation drove a strategic wedge between the large and growing banks on one hand and the smaller community banks on the other hand. The result is shown in Figure 6. Large banks have moved in a southwest direction on the map, sacrificing personalized service for large scale, and gaining low unit costs by shifting to automated production techniques. Although many community banks have also grown larger via mergers, they have continued to occupy the same strategic ground. By virtue of their small size, local economic focus, and person-to-person ethos, community banks are well suited to gathering the soft information necessary to deliver highly

differentiated small business credit products and high-end consumer banking services.⁴² If well-managed, this more traditional strategy should allow community banks to charge high enough prices to earn satisfactory rates of return, despite their higher cost structures. In this view of the banking industry, community banks are differentiated from large banks by their “high value-added” strategy.

Before moving on, we must make three additional points before our strategic analysis is complete. First, the four corners of the strategy space represent the only *potentially* viable strategic choices for banks; being “stuck in the middle” of such a map indicates the lack of a strategy, and leads to financial disaster (Porter 1980). Second, the Northwest corner of the strategy space (high cost, low value-added) is not a viable strategy, for obvious reasons. And finally, although the Southeast corner of the strategy space (low cost, high value-added) is the most preferred location, it is unlikely to be a viable long-run strategy. Without some kind of entry barrier (e.g., patents, monopoly rights), the excess profits generated at this location will invite entry and the resulting competition will compress margins back to a normal rate of return. However, the mere existence of this strategic ground, and the excess profits that banks can earn in the short-run or moderate-run by occupying it, creates an incentive for both large and small banks to innovate. Moreover, banks that do not strive via innovation to reach this strategic ground are likely to leave the industry in the long-run.

3.2 Testing the framework against the data

To be sure, Figures 5 and 6 oversimplify the broad changes in the banking industry over the past three decades and the effects these changes have had on banking strategies. For example, some large banks offer customized services to certain sets of clients with idiosyncratic financial needs, such as corporate investment banking clients and high net worth “private banking” customers. Furthermore, some small Internet-only banks specialize in providing extremely standardized retail banking services.⁴³ But the simplifications in this framework allow us to isolate the main characteristics of community banks and large banks – small size, local focus, and more traditional banking technology versus large size, broad appeal, and highly automated banking technology – and in turn to realize that community bank strategies

and large bank strategies rely on different profit drivers. If this framework is indeed representative of the market structure and firm behaviors found in the U.S. banking industry, then addressing the following question will go a long way to determining the future facing community banks: Is a customized, high-value-added approach to retail and small business banking financially competitive with a standardized, commodity-based approach?

Addressing this question requires us to first expose our simple strategic framework to careful empirical scrutiny. First, are the assumptions embedded in this framework consistent with the data? Relative to community banks, do large banks have lower unit costs, lower interest margins, use “harder” information, and sell financial services that are more standardized? Second, are the dynamics of the framework supported by the data? Have large banks and community banks grown less alike over time in terms of size, production methods, output mix, and financial structure? Only after addressing these first two questions in the affirmative can we address the third set of questions to which the framework naturally leads us: Is the situation illustrated in Figure 6 an industry equilibrium? Or will further changes be necessary before the industry is in equilibrium? And will that new equilibrium include community banks as we currently know them?

Question 1: In what ways do community banks and large banks differ today? We refer to the data in Appendix Table A-1 to examine whether recent differences between community banks and large banks are consistent with the industry equilibrium depicted in Figure 6.⁴⁴ The table displays mean values for a variety of financial ratios and strategy variables for U.S. banks at year-end 2001. The banks are separated into six peer group categories: large banks, mid-sized banks, large community banks, medium community banks, and rural banks. Unless otherwise indicated, we use these same category definitions throughout the remainder of this study.

To be included in the analysis banks had to meet the following criteria: they held a state or federal commercial bank charter; they were located in one of the fifty states or the District of Columbia; they were at least ten full years old (DeYoung and Hasan 1998); and they had reasonably traditional bank

balance sheets that included loans, transactions deposits, and insured deposits. Urban banks (i.e., banks located in MSAs) are organized into five asset size categories: small community banks with assets less than \$100 million; medium community banks with assets between \$100 and \$500 million; large community banks with assets between \$500 million and \$1 billion; mid-sized banks with assets between \$1 and \$10 billion; and large banks with more than \$10 billion in assets. Rural banks are included as a separate category because of their special role in providing agricultural credit and because they tend to face less competition in the rural towns in which they are located; however, rural banks use a business model very similar to community banks, and for most purposes can be considered to be community banks. Banks in the rural bank category and the three community bank categories had to meet the following additional conditions: they were domestically owned; credit card receivables comprised no more than ten percent of their loan portfolios; they derived at least half of their deposits from branches located in a single county; and they were organized as either an independent bank, the sole bank in a one-bank holding company, or an affiliate in a multibank holding company comprised solely of other community banks.

Note that these six peer group categories do not collectively contain the full population of U.S. commercial banks in any given year. For example, at year-end 2001 the FDIC reported that there were 8,080 commercial banks operating in the U.S., while our sample selection process and peer group definitions exclude 1,416 of these banks, leaving us with a sample of 6,664 banks for 2001. Also note that our analysis of bank strategies and financial performance is based on bank-level data (largely from the Call Reports) rather than bank holding company-level data. We choose to compare the performance of community banks – most of which are not affiliated with multibank holding companies – to the performance of other community and non-community banks at the same level of organization.

Obviously, community banks by definition are smaller than “large” banks. But the magnitude of the size disparity displayed in Table A-1 is staggering: the average \$60 billion large bank is on the order of 100 times larger than the average large community bank; 300 times larger than the average medium community bank; and 1200 times larger than the average small community bank. These huge size

differences are consistent with the strategic situation depicted in Figure 6, and suggest that large banks may have access to a different set of business strategies than community banks. Indeed, the data in Table A-1 indicate that large banks take advantage of their size to produce a different mix of financial services than community banks, and use different production, distribution, and corporate organization technologies to do so. These documented differences are fully consistent with the assumptions embedded in our strategic framework.

On average, the ratio of loans-to-assets differs very little across the different bank categories, ranging between 60 percent and 65 percent. The composition of loans varies greatly, however, as does the manner in which these loans are produced and distributed. The most striking difference can be seen by comparing credit card loans to small business loans. Credit card loans (also included in consumer loans) comprise nearly 10 percent of all loans held by large banks, but less than two percent of loans held by community banks and rural banks.⁴⁵ In contrast, small business loans (commercial and industrial loans with principal amounts at origination of less than \$1 million) comprise only about 5 percent of all loans held by large banks, but as much as 17 percent of loans held by community banks. (Small agricultural loans comprise almost 14 percent of rural bank loans.) This evidence is consistent with the idea that large banks tend to engage in transactions lending while community banks tend to engage in relationship lending. Moreover, there is direct evidence that transactions lending is central to the business strategies of large banks: about 23 percent of large bank assets are sold and securitized (with loan servicing rights retained, or with recourse or other seller-provided credit enhancements) during the course of the year, compared to less than 1 percent of community bank assets; and about 6 percent of large bank noninterest income comes from securitization fees, compared to about 1/10th of 1 percent of noninterest income at community banks.⁴⁶

Large banks and community banks differ substantially on the right-hand-side of the balance sheet as well. Community banks and rural banks finance between 81 and 86 percent of their assets, on average, using deposits, compared to only about 56 percent for large banks.⁴⁷ Large banks make up the difference by purchasing federal funds from other banks, issuing subordinated and nonsubordinated debt, and selling

commercial paper. As opposed to raising funds by issuing deposits, this is pure financing activity with no possibility of generating service charges or other income generated from depositor relationships. The composition of deposits also differs systematically across bank categories. Core deposits (transactions deposits plus small time deposits) comprise only 34 percent of total deposits at large banks, but this ratio increases steadily and substantially as banks get smaller: 39 percent at mid-sized banks; 44 percent at large community banks; 57 percent at medium community banks; 65 percent at small community banks; and 67 percent at rural banks. This pattern is telling – core deposits are largely insured deposits, are unlikely to leave the bank in the short-run, and as such represent a base of customers with which a bank can potentially build relationships.

Despite these differences in funding, the ratio of interest expense-to-assets varies very little across urban banks, declining only slightly with asset size from around 3% for community banks, to 2.90% for mid-sized banks, to 2.77% for large banks.⁴⁸ Community banks more than recover this 23 basis point disadvantage by earning higher ratios of interest income-to-assets: 6.92% for small community banks versus only 6.064% for large banks. The net result is substantially larger interest margins of between 3.72% and 3.96% for community banks, compared to only 3.29% for large banks.⁴⁹ Although interest rates earned vary with the composition of invested assets, high interest margins (all else equal) are consistent with a “high value-added” personalized banking strategy and low interest margins are consistent with a “high volume, low cost” transactional banking strategy.

Another telling difference is noninterest income, which is equal to 2.49 percent of assets at large banks – notable because it makes nearly as large a contribution to paying bank overhead as the net interest margin, and also because it dwarfs the noninterest income generated by community and rural banks which ranges between just 0.67 to 1.05 percent of assets. The composition of noninterest income shows that this disparity reflects a basic strategic difference between these two sets of banks. Service charges on deposit accounts comprise between 41 percent and 63 percent of noninterest income at community and rural banks, but amount to only 20 percent of the noninterest income generated by large banks. (And this disparity is even more substantial than it at first appears, given that the fee structure on deposit accounts

works in the opposite direction: income from service charges is only about 2-to-3 cents per dollar of transactions deposits at community and rural banks, but is in the 4-to-5 cent range at large and mid-sized banks.) At large banks, service charges are just one part of a broader portfolio of traditional and nontraditional activities that includes substantial amounts of noninterest income from securitization, investment banking, trading, and fiduciary activities.

This broad mix of financial activities at large banks has implications for organizational form. The large size and scope of these banks makes a multibank holding company organizational form more efficient. About 65% of the large banks are affiliates in MBHCs, compared to between 7% and 17% of rural and community banks. A MBHC structure allows retail banking, credit card banking, investment banking, insurance activities, etc. to be separately capitalized and managed.

Sales and management of mutual funds is another indicator of the less traditional business strategy practiced by large banks. About 82 percent of large banks sell mutual fund investments to their customers (versus 16 percent to 53 percent of community and rural banks) and 50 percent of large banks manage and sell their own proprietary mutual funds. Mutual funds are a good example of financial services that can complement both of the strategic approaches depicted in Figure 6: as part of a high-touch customer relationship in which the bank provides personalized investment advice, or as one of many items on a menu offered by a high-volume, low-frills financial outlet. To be sure, some large banks have built their franchise on the former approach (e.g., Northern Trust in Chicago and U.S. Trust in New York). But the latter approach is more consistent with the large amount of transactions-based loans and purchased deposits found at the average large bank.

The manner in which financial services and products are delivered to customers also varies substantially between large banks and community banks. Almost all (96 percent) large banks operate transactional Internet websites, compared to only 7 percent, 32 percent, and 54 percent of small, medium, and large community banks. A transactional website (at which customers can pay bills, transfer funds, make investments, apply for loans, etc.) can entirely obviate visits to brick-and-mortar banks for customers happy with standardized financial services and a low-touch banking “relationship.” But for

relationship customers that need more highly customized financial services or prefer a more personalized approach, an Internet website can only complement, not replace, brick-and-mortar branches. Community banks operate considerably more physical office locations (branches plus head office) per dollar of assets, dollar of deposits, and number of deposit accounts, than do large banks. Community banks also employ more workers relative to these same measures of output than large banks, despite the fact that they employ considerably fewer employees per office.

It is not clear whether the low ratios of assets-per-FTE, deposits-per-office, and accounts-per-office at community banks reflect inefficient management or diseconomies of scale.⁵⁰ Nevertheless, the issue of economies of scale is central to our strategic framework. Any scale-based reduction in unit costs provides a competitive advantage for the large bank business strategy, while at some increased size can hamper the application of a locally focused, highly personalized community banking strategy. Unfortunately, the data in Table A-1 do not allow us to directly compare the unit costs of large banks and community banks. Unit costs can vary greatly with business strategy (for example, idiosyncratic small business loans are more expensive to originate and monitor than transactions loans like credit cards and home mortgages), and unit costs can vary greatly with how efficiently a bank is operated (the average large bank is likely to be better run, all else equal, than the average community bank because it has access to better quality managerial talent and as a publicly traded firm faces pressure from the capital markets to perform). Some of the more recent studies on bank scale economies use stochastic cost frontier techniques, which when used correctly can control for both of these effects. Although this literature (discussed above) has not yet reached a complete consensus, there is broad agreement across studies that growth can generate substantial reductions in unit costs for the smallest banks. The extent to which the trade-off between lower costs and local focus favors large banks over community banks, or large community banks over small community banks, should show up in bank earnings, which we explore below in our analysis of Question 3.

For two sets of banks with such different input and output mixes, it is not surprising that large banks and community banks also have different risk profiles. At the end of 2001 a greater proportion of

loans at large banks were nonperforming (about 0.9 percent versus 0.6 to 0.7 percent at community banks) and the allowance for loan losses was much larger (about 5 percent versus 1 to 2 percent) at large banks than at community banks. These differences may be attributable to a variety of phenomena, including differences in underwriting techniques, differences in appetite for risk-taking, large bank participations in large loans underwritten by other banks, or greater capacity at large diversified banks to sustain loan losses.⁵¹ Despite the larger levels of credit risk – or perhaps because of a greater ability of large banks to boost loan loss reserves or manage risk with derivative instruments – the Tier 1 risk-based capital ratio was only 12.61 percent at large banks, compared to 17.52 percent at small community banks and 18.84 percent at rural banks. The high amount of noninterest income at large banks can also be a source of increased earnings volatility (DeYoung and Roland 2001, Stiroh 2003, 2004).

A final, telling difference between large banks and community banks in Table A-1 is the amount of resources they expend on advertising and marketing. Advertising and marketing expenditures at large banks are equal to 0.11 percent of assets, two-and-a-half to three times more than expenditures at community banks or even at mid-sized banks. While the local focus and personal touch of community banks allows them to rely more on word of mouth and local media, the broad focus and transactions-based practices of large banks requires (ironically) large banks to spend more money to get noticed. A large advertising budget is also consistent with retail advertising aimed at creating differentiation via brand image.

Question 2: Have community banks and large banks grown different over time? The data presented in the previous section provide strong evidence that community banks and large banks use different business strategies. Have these two types of banks always used such different business strategies? Or, as suggested by Figure 6, have large banks and community banks become more different as deregulation and technological change have driven a “strategic wedge” into the banking industry? We offer support for this strategic analysis by showing that the major parameters of the strategic framework have been diverging over the past decade for large banks and community banks.

Unlike our very thorough investigation of Question 1, we use only a relative handful of financial ratios and strategy indicators to address Question 2. Bank regulators only recently began to collect some of the most interesting strategic characteristics of banks (e.g., mutual fund sales, securitization activities, advertising expenditures, small business lending). This precludes the construction of the long time series of ratios necessary to test whether and how these bank characteristics have varied over time.⁵² But the relative changes in large banks and community banks over the past decade have been clear and unmistakable, and only a handful of data are needed to illustrate this point.

The most fundamental strategic difference in Figure 6 is the growing disparity in the size of large banks and community banks, driven by (a) deregulation allowed banks to grow via acquisition across geographic borders, and (b) new information and financial technology that allowed banks to produce loans and other financial services more efficiently at large scale. The 1991-2001 asset size data displayed in Table 3 are consistent with this. The entire size distribution of banks shifted up during the 1990s, but increased size among the larger banks dominated. For example, in the bottom half of the size distribution bank size increased by between 23 and 46 percent, while in the top half of the distribution bank size increased by between 46 and 76 percent. Moreover, the size differences between the largest and smallest banks widened, with the largest relative changes occurring at the very top of the distribution. For example, in 1991 the bank at the 99th percentile was 786 percent larger than the bank at the 95th percentile, and by 2001 this difference had widened to 931 percent.

As discussed above, the literature on bank scale economies finds that increased asset size translates into lower unit costs, holding output mix constant. But as we also discussed above, bivariate comparisons of unit costs across categories of banks do not hold output mix constant. So we cannot, without performing an analysis well beyond the scope of this investigation, responsibly investigate whether, and by how, the difference in unit costs between large banks and community banks widened during the past several decades. However, we can investigate whether more easily measurable bank characteristics like loans balances, deposit balances, and noninterest revenue have diverged across time for large banks and community banks.

Figures 9, 10, and 11 display indexed time series for, respectively, loans-to-assets, core deposits-to-assets, and noninterest income-to-operating income between 1991 and 2001. Each of the figures show time series for six categories of banks, all of which are indexed to equal 1.00 in 1991. Figure 9 displays time series for loans held on the balance sheet, the most traditional of all banking products. The figure clearly shows that community banks and rural banks have invested more heavily in portfolio loans over time relative to larger banks. Figure 10 displays time series for core deposits, the most traditional of all banking inputs. The figure clearly shows that large and mid-sized banks – and to a lesser degree, large community banks – became less reliant on core deposits during the decade, while small community banks, medium community banks, and rural banks remained very reliant on core deposits. Figure 11 displays time series for noninterest income, which increasingly is an indicator of nontraditional banking activities. This data in this figure are noisy, but a relatively clear story still emerges for large banks versus community banks. The figure shows that large banks have become more reliant on noninterest income over time, while the three categories of community banks have become less reliant on noninterest income.⁵³ Taken together, the data in Table 3 and Figures 9 through 11 offer clear support for the “strategic wedge” part of our strategic analysis.

Question 3: Is the community banking strategy profitable in the long-run? We have provided plenty of evidence that community banks are using a different business strategy than large banks; that the strategies used by these two types of banks have been diverging over the past decade; and furthermore, that the two strategies continue to diverge today. Because the evidence suggests that large banks are purposely moving away from the traditional strategic ground held by community banks – in terms of increased asset size, less reliance on relationship-based core deposits, and more reliance on nontraditional financial services as sources of income – it would seem logical that the business strategy being pursued by large banks is at least as profitable as the one they are abandoning. The crucial question, then, is whether the more traditional community banking strategy being abandoned by large banks remains a profitable one?

The 4,000 de novo commercial banks that were chartered over the past two decades suggest that banking entrepreneurs believe the community bank strategy is profitable. Recent studies find that de novo banks are more likely to start-up in markets where large out-of-market banks have purchased local banks (Berger, Saunders, Scalise, and Udell 1998; Keeton 2000; Berger, Bonime, Goldberg, and White forthcoming) and to some extent in markets where two incumbent banks have combined (Seelig and Critchfield 2003).⁵⁴ In addition, these new bank start-ups (along with local incumbent banks) are likely to gain additional small business clients by picking up business jettisoned by the recently acquired target banks (Berger, Saunders, Scalise, and Udell 1998). All of these results are consistent with our strategic analysis that large banks have abandoned traditional relationship lending as they have grown larger via mergers. Figure 7 uses the strategic map to illustrate this “de novo backlash” phenomenon.

The profitability and risk ratios analyzed above suggest that there are systematic differences in financial performance across banking strategies. Table 4 displays the distributions of average ROE, the standard deviation of ROE, and the Sharpe Ratio for our six categories of banks, based on annual data for the banks that operated in every year from 1995 through 2001.⁵⁵ The community and rural banks generate lower ROE than the large banks at every point in the distribution. (Note that these are just numerical differences, not statistical tests.) Of course, these ROE data are not adjusted for risk, and hence may not be directly comparable across banks with different business models if those strategies require banks to take different amounts of risk. Interestingly, community bank and rural bank ROE are less volatile at all points of the distribution than large bank ROE, suggesting that the risk-adjusted returns earned by community and rural banks may be relatively comparable to returns earned by larger banks. Indeed, the Sharpe Ratio indicates that risk-adjusted ROE at large community banks and medium community banks actually exceeds risk-adjusted large bank ROE throughout the distribution. However, at small community banks risk-adjusted – and to a lesser extent at rural banks – risk-adjusted returns tend to fall short of large banks.⁵⁶

These poor results for small community banks and rural banks do not necessarily indicate that these business models are less profitable than the large bank business model. The data in Table 4

combine two sets of banks within each category: well-managed banks that do a good job of implementing their chosen banking strategy, and poorly-run banks that implement that strategy inefficiently.⁵⁷ Table 5 crudely controls for the possibility that banks in the latter group are dragging down the average financial performance for the entire group. The table separates each group of banks into two halves, above and below the median ROE for the group. The banks in each of the upper subgroups might be considered “best-practice” users of their particular business strategy. Nine different financial ratios are calculated for each subgroup, and the means of these subgroup financial ratios are reported in the table. Best-practices ROE at large and medium community banks (17.25% and 16.14%) compare favorably to the overall average ROE at large and mid-sized banks (15.45%), but best-practices ROE at small community banks and rural banks does not (14.17% and 13.51%). This is at least partly due to less financial leverage (higher equity-to-assets ratios) at these small banks, as indicated when the earnings comparisons are made based on ROA rather than ROE: the best-practices ROA for the rural banks and all of the community banks exceeds the average ROA for the large and mid-sized banks. But the fact that best-practices rural and small community banks earn lower ROE and ROA than best-practices medium and large community banks suggests that these small banks are penalized by their low scale of operations.

There is a dramatic disparity in both ROE and ROA between the best-practices and “worst-practices” community banks and rural banks. However, it is instructive that both the best-practices and worst-practices community and rural banks have high (and quite similar) levels of core deposits and small business loans – two characteristic elements of the community bank business model. This is strong evidence that the community bank business model is viable, but that it takes a well-run organization to make it work. Table 5 also shows that best-practices community banks lend out larger proportions of their assets; generate higher amounts of noninterest income; earn higher net interest margins; and notably, have substantially lower accounting efficiency ratios (noninterest expense as a percentage of operating income).

While the data comparisons in Tables 4 and 5 are crude, they are strongly suggestive that the community bank business model is economically viable. However, the data also suggest that a large

number of community banks are not operating the model in a fully profitable manner, due to a combination of low scale and poor management practices.

4. Conclusions – Whither the Community Bank?

On balance, the evidence provided here suggests that the community bank business model is economically viable. But it is important to understand the limitations of this conclusion. This does not mean that community banks can profitably compete in every segment of the financial services market. Certainly there are some markets that community banks cannot play in, and never have: capital markets products (e.g., underwriting corporate debt and equity issues, writing backup lines of credit to support commercial paper offerings) and large shared commercial credits are two examples. Rather, it suggests that a community bank business model that emphasizes personalized service and relationships based on soft information is likely to be viable in the long run. This also does not mean that all community banks will be financially successful. The data are clear in their indication that efficient community banks can be viable rivals with larger banks in providing financial services to retail consumers and small business clients. Finally, the data indicate that size does matter for community banks. Although our analysis does not compare unit costs across different sizes of banks, combining what we know from the bank scale economy literature with the profitability analysis performed here indicates that the smallest community banks (less than \$100 million in assets) have to be hitting on all cylinders to overcome their size disadvantages and earn returns comparable to other community banks, much less comparable to large banks.

All in all, the data offer strong support for the strategic map analysis depicted above in Figures 5, 6, and 7 and the new industry equilibrium that it suggests. But the banking industry will not stand still. To a large extent the survival of community banks in the future depends on the ability of large banks to increase the personalization and customization of their services, while still maintaining their low unit cost advantage. As illustrated in Figure 8, large banks that can do that will be moving toward the Southeast corner of the strategic map; a successful move by large banks in that direction will make it very difficult

for community banks to compete. How might large banks be able to do this? One real possibility is for large banks to compete head-to-head with community banks by expanding their networks of brick-and-mortar branches into local neighborhoods. This scenario is currently being played out in the Chicago market, where Bank of America, Bank One, Harris Bank, LaSalle Bank and Washington Mutual are (combined) in the process of constructing over one hundred new brick-and-mortar branches. Operating at a larger number of more convenient locations, combined with the advantages of large size, may permit these large banks to infringe on the “high-value-added” portion of the strategy space currently occupied by community banks, and is crucial to their ability to cover their high cost structures.

Of course, community banks can take action to move closer to the Southeast corner as well. One possibility is to take advantage of scale without getting large. Community banks may be able to capture technology-based scale savings by carefully outsourcing applications – like loan securitization, brokerage, or their Internet website – to nonbank financial services vendors. The key is to act larger, while still maintaining their high value-added approach – and not losing the customer relationship to the vendor in the process.

To close, we offer an oblique answer to the \$64,000 question: How many community banks will there be in the future? Attempting to answer this question is a fool’s game, of course, so we will be very circumspect. Earlier (and noble) attempts at projecting the number of banks in the future have all missed the mark for one unpredictable reason or another (e.g., Nolle 1995; Berger, Kashyap, and Scalise 1995). These studies were based on extrapolations of industry structural trend lines into the future.⁵⁸ We propose a different methodology that is based in part on the logic of our strategic map analysis. We start with the current population of community banks, and gradually remove the least profitable community banks from the data set, until the average ROE of the community banks remaining is at least equal to the average ROE of the current population of large banks.

This is an extremely simple approach, and it relies on two basic assumptions. First, that the current population of large banks is stable, but that more community banks still need to exit the industry. Second, that bank investors will move their capital out of relatively unprofitable banks – in the banking

industry this typically happens via acquisition by a different bank. Neither of these assumptions is fully realistic, but neither is it pure fantasy.

Table 6 shows the results of this approach. It is necessary to remove the least profitable 40 percent of large community banks before the median ROE of this group of banks becomes equal to the median ROE at large and mid-sized banks. Similarly, 60 percent of the medium-sized community banks, 70 percent of the small community banks, and 80 percent of the rural banks must be removed before these groups hit the large bank profitability threshold. Scale economies are obviously an issue here, combined with X-inefficiency.

This exercise is meant to be instructive rather than predictive. Its results can be extremely sensitive to the manner in which it is parameterized. For example, when we replace ROE with the Sharpe Ratio in Table 6, only 40 percent of the small community banks, and only 20 percent of the rural banks, exit the industry. The results will also be sensitive to the existence of X-inefficiency among large banks; the degree to which small banks, and especially rural banks, face the competitive pressure necessary to force poor performers from the market; the non-profit-maximization motives of many community bank owner-operators; and the appropriate risk-adjustments to make across different banking strategies. Future research on the viability of community banks may be able to better identify some of these parameters. On the other hand, depending on the relative pace of industry consolidation and the production of new bank research, the marketplace may simple provide these answers for us.

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Table 1
Value of Consumer Financial Assets

Value of Financial Assets (Percent)	1983	2001
1. Checking and money market deposit accounts	7.3	4.6
2. Money market mutual funds, and brokerage call accounts	8.9	4.5
3. Savings accounts	5.2	2.6
4. Certificates of deposit	10.2	3.1
5. Savings bonds	0.8	0.7
6. Bonds	8.7	4.5
7. Stocks	26.1	21.5
8. Mutual funds (excluding MMMFs)	2.9	12.2
9. Retirement accounts *	9.5	28.2
10. Cash value of life insurance policies	7.7	5.3
11. Other managed assets	11.8	10.9
12. Other	0.9	2.0
Total	100.0	100.0

Source: Federal Reserve Board Survey of Consumer Finance

* Includes money market accounts that are held in 401(k) and other retirement accounts.

Table 2
Consumer Debt

Amount of Debt (Percent)	1983	2001
1. Commercial bank	28.5	34.1
2. Thrift institution	29.1	6.1
3. Credit union	2.2	5.5
4. Total depository institutions	59.8	45.7
5. Finance or loan company	3.6	4.3
6. Brokerage	3.1	3.1
7. Mortgage or real estate lender	11.6	38.0
8. Individual lender	12.3	2.0
9. Other nonfinancial	1.9	1.4
10. Government	4.7	1.1
11. Credit card and store card *	0.0	3.7
12. Pension account	NA	.3
13. Other	2.8	.5
Total	100.0	100.0

Source: Federal Reserve Board Survey of Consumer Finance

* Credit card and store card debt for 1983 was 0.03 percent of consumer debt.

Table 3
Selected percentiles from the asset size distribution of U.S. commercial banks, 1991-2001.

	Asset size percentiles (2001 dollars)								
	99th	95th	90th	75th	50th	25th	10th	5th	1st
1991	\$5,993,780	\$676,367	\$312,681	\$132,358	\$62,349	\$31,659	\$18,366	\$13,763	\$7,559
2001	\$10,523,563	\$1,019,929	\$486,744	\$201,085	\$91,244	\$46,058	\$25,169	\$18,017	\$9,333
% change	75.57%	50.80%	55.67%	51.93%	46.34%	45.48%	37.04%	30.91%	23.47%
	Percentage differences across asset size percentiles								
	99th to 95th	95th to 90th	90th to 75th	75th to 50th	50th to 25th	25th to 10th	10th to 5th	5th to 1st	
1991	786.17%	116.31%	136.24%	112.28%	96.94%	72.38%	33.45%	82.06%	
2001	931.79%	109.54%	142.06%	120.38%	98.11%	82.99%	39.70%	93.05%	

Source: Authors' calculations using data from the Call Reports (FDIC).

Table 4

Distribution of Mean Return on Equity (ROE), Standard Deviation of ROE, and Sharpe Ratio.

All calculations based on 7 years of annual data from 1995-2001. All data is in 2001 dollars. Sharpe Ratio = (mean ROE – mean one-year constant maturity T-Bill rate)/standard deviation of ROE. # (*) indicates number is higher (lower) than number in first row for large banks. Large banks have more than \$10 billion in assets. Mid-sized banks have between \$1 billion and \$10 billion in assets. Large community banks have between \$500 and \$1 billion in assets. Medium community banks have between \$100 and \$500 million in assets. Small community banks have less than \$100 million in assets.

	Distribution percentiles					
	10%	25%	50%	75%	90%	N
ROE						
Large banks	0.1085	0.1259	0.1527	0.1804	0.2226	52
Mid-sized banks	0.0919*	0.1224*	0.1507*	0.1815#	0.2274#	147
Large community banks	0.0936*	0.1176*	0.1419*	0.1637*	0.1934*	91
Medium community banks	0.0762*	0.0966*	0.1204*	0.1504*	0.1859*	689
Small community banks	0.0510*	0.0776*	0.1001*	0.1328*	0.1820*	825
Rural banks	0.0603*	0.0825*	0.1044*	0.1313*	0.1605*	2979
Standard deviation of ROE						
Large banks	0.0183	0.0260	0.0407	0.0612	0.0878	52
Mid-sized banks	0.0109*	0.0170*	0.0298*	0.0471*	0.0736*	147
Large community banks	0.0089*	0.0122*	0.0187*	0.0338*	0.0517*	91
Medium community banks	0.0081*	0.0122*	0.0198*	0.0343*	0.0550*	689
Small community banks	0.0098*	0.0154*	0.0253*	0.0427*	0.0771*	825
Rural banks	0.0082*	0.0128*	0.0199*	0.0319*	0.0504*	2979
Sharpe Ratio						
Large banks	0.6140	1.4595	2.5615	4.0340	5.4199	52
Mid-sized banks	0.9361#	1.9241#	3.3830#	5.8626#	9.0639#	147
Large community banks	1.5505#	2.7718#	4.6071#	7.2858#	9.2595#	91
Medium community banks	0.8372#	1.9503#	3.5087#	5.5110#	8.3077#	689
Small community banks	-0.1238*	0.8305*	2.1576*	3.6891*	5.4660#	825
Rural banks	0.2980*	1.3232*	2.6394#	4.2766#	6.6798#	2979

Source: Authors' calculations using data from the Call Reports (FDIC).

Table 5

Mean financial ratios for above median and below median ROE subsamples in 2001.

Large banks have more than \$10 billion in assets. Mid-sized banks have between \$1 billion and \$10 billion in assets. Large community banks have between \$500 and \$1 billion in assets. Medium community banks have between \$100 and \$500 million in assets. Small community banks have less than \$100 million in assets. For rural banks, small farm production loans are used in place of small business loans.

	ROE		ROA		Equity/Assets	
Mean for large and mid-sized banks	0.1545		0.0125		0.0864	
	above median ROE	below median ROE	above median ROE	below median ROE	above median ROE	below median ROE
Large community banks	0.1725	0.1115	0.0140	0.0106	0.0833	0.0961
Medium community banks	0.1614	0.0888	0.0143	0.0094	0.0895	0.1055
Small community banks	0.1417	0.0597	0.0128	0.0070	0.0940	0.1110
Rural banks	0.1351	0.0699	0.0131	0.0089	0.0992	0.1253
	Loans/Assets		Noninterest Income/ Operating Income		Noninterest Expense/ Operating Income	
Mean for large and mid-sized banks	0.6156		0.2853		0.6083	
	above median ROE	below median ROE	above median ROE	below median ROE	above median ROE	below median ROE
Large community banks	0.6360	0.5672	0.2349	0.1935	0.5773	0.6351
Medium community banks	0.6320	0.5738	0.1801	0.1610	0.5921	0.6721
Small community banks	0.5967	0.5441	0.1639	0.1487	0.6361	0.7498
Rural banks	0.5970	0.5198	0.1395	0.1222	0.5941	0.6759
	Net Interest Margin		Core Deposits/Assets		Small Business Loans/Total Loans	
Mean for large and mid-sized banks	0.0371		0.3267		0.0505	
	above median ROE	below median ROE	above median ROE	below median ROE	above median ROE	below median ROE
Large community banks	0.0380	0.0380	0.4558	0.4255	0.1201	0.1375
Medium community banks	0.0429	0.0392	0.5215	0.5179	0.1520	0.1409
Small community banks	0.0426	0.0404	0.5858	0.5721	0.1702	0.1467
Rural banks	0.0404	0.0384	0.5909	0.5908	0.1479	0.2005

Source: Authors' calculations using data from the Call Reports (FDIC).

Table 6

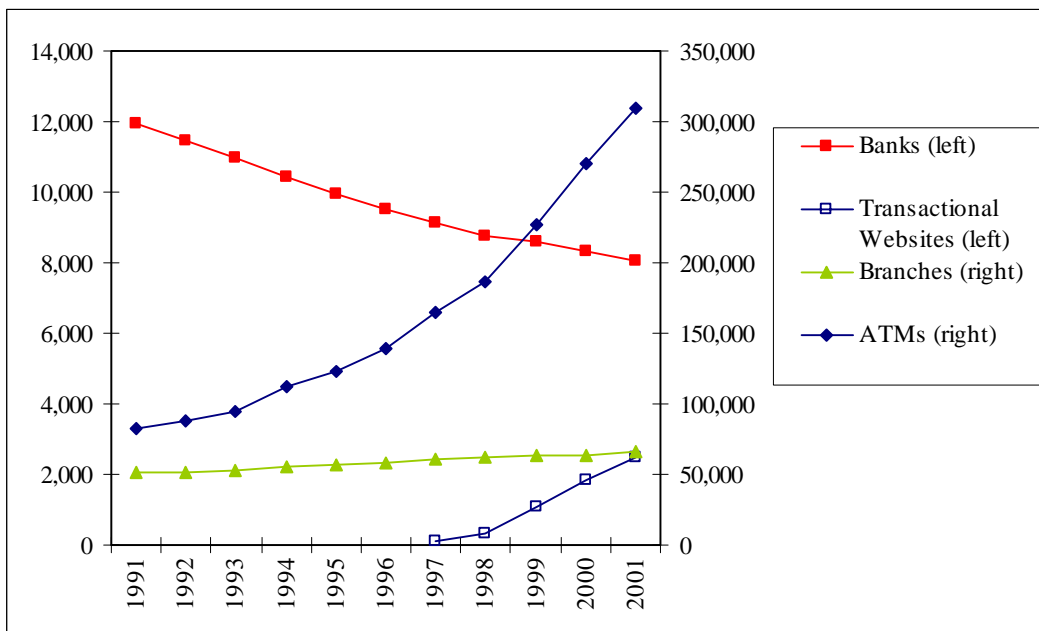
Median ROE and Sharpe Ratio comparisons for subsamples of community banks.

(*) indicates number is higher (lower) than the benchmark number for Large and Mid-sized banks. All data is in 2001 dollars. Large banks have more than \$10 billion in assets. Mid-sized banks have between \$1 billion and \$10 billion in assets. Large community banks have between \$500 and \$1 billion in assets. Medium community banks have between \$100 and \$500 million in assets. Small community banks have less than \$100 million in assets.

Benchmark: Median ROE for combined large and mid-sized bank samples	0.1511	0.1511	0.1511	0.1511	0.1511	0.1511	0.1511	0.1511	0.1511
Median ROE for community bank subsamples:	all	top 90%	top 80%	top 70%	top 60%	top 50%	top 40%	top 30%	top 20%
Large community banks	0.1419*	0.1439*	0.1461*	0.1493*	0.1545#	0.1637#	0.1696#	0.1773#	0.1938#
Medium community banks	0.1204*	0.1249*	0.1312*	0.1382*	0.1449*	0.1506*	0.1600#	0.1687#	0.1859#
Small community banks	0.1028*	0.1069*	0.1136*	0.1199*	0.1272*	0.1359*	0.1483*	0.1614#	0.1855#
Rural banks	0.1076*	0.1121*	0.1166*	0.1217*	0.1268*	0.1339*	0.1409*	0.1502*	0.1634#
Benchmark: Median Sharpe Ratio for combined large and mid-sized bank samples	3.1037	3.1037	3.1037	3.1037	3.1037				
Median Sharpe Ratio for community bank subsamples:	all	top 90%	top 80%	top 70%	top 60%				
Large community banks	4.6071#	5.2035#	5.5925#	6.1930#	6.8114#				
Medium community banks	3.5087#	3.8248#	4.1384#	4.5375#	5.0604#				
Small community banks	2.3055*	2.5706*	2.7837*	3.0539*	3.4665#				
Rural banks	2.8216*	3.0484*	3.3257#	3.6948#	4.0513#				

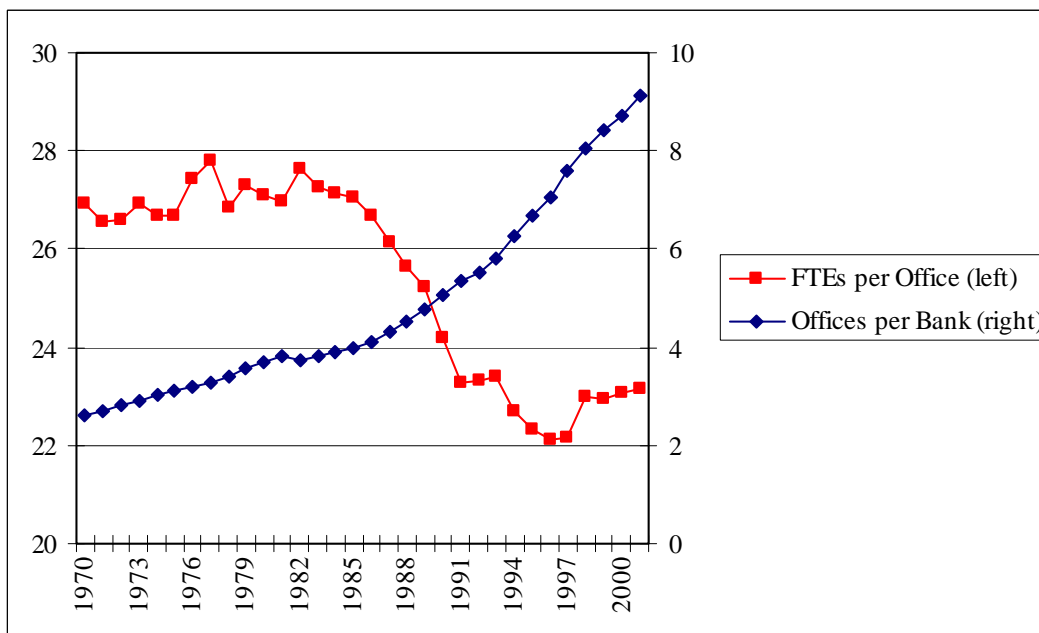
Source: Authors' calculations using data from the Call Reports (FDIC).

Figure 1
Distribution channels for U.S. Commercial Banks, 1991-2001.



Source: Data on banks and branches from FDIC website. Data on transactional websites from internal FDIC records. Data on ATMs from Bank Network News annual Data Book.

Figure 2
FTEs and Offices at U.S. Commercial Banks, 1970-2001.

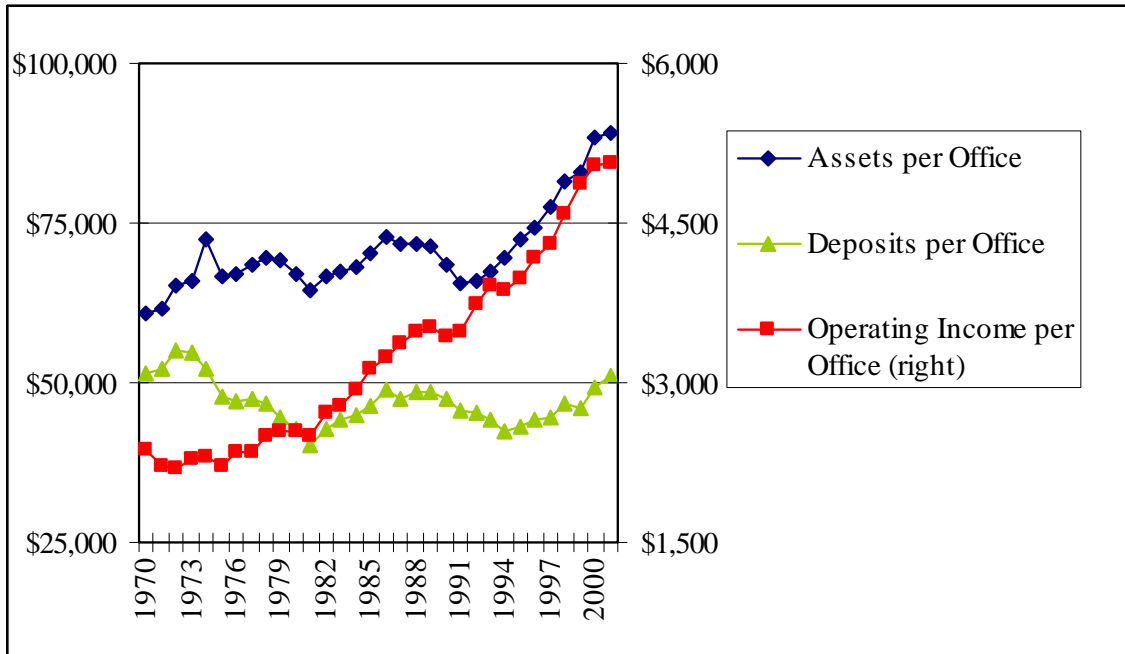


Offices = number of full service physical locations (branches plus the head office).

FTEs = number of full time equivalent employees.

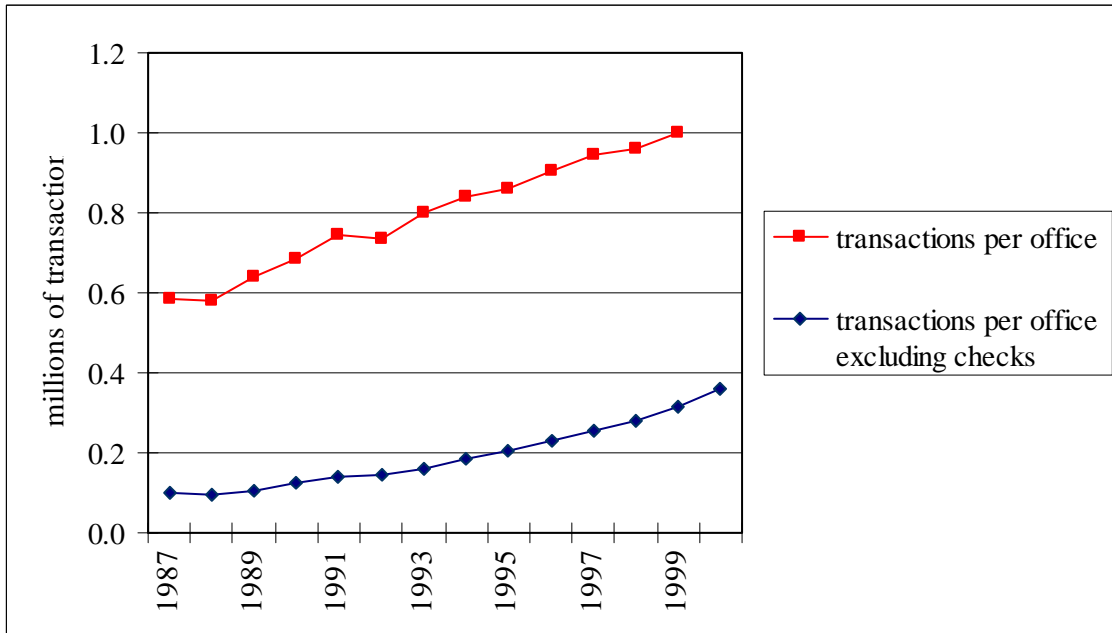
Source: Authors' calculations using data from FDIC website and Call Reports.

Figure 3
Output per office, U.S. Commercial Banks, 1970-2001.



Source: Authors' calculations using data from FDIC website and Call Reports.

Figure 4
Number of payments transactions per office in the U.S., 1987-2000.
Offices include branches and main offices of banks, thrifts, and credit unions. Transactions include checks, debit cards, credit cards, direct debits, and direct credits.



Source: "Statistics on Payments and Settlement Systems in Selected Countries," Bank for International Settlements, 2002.

Figure 5

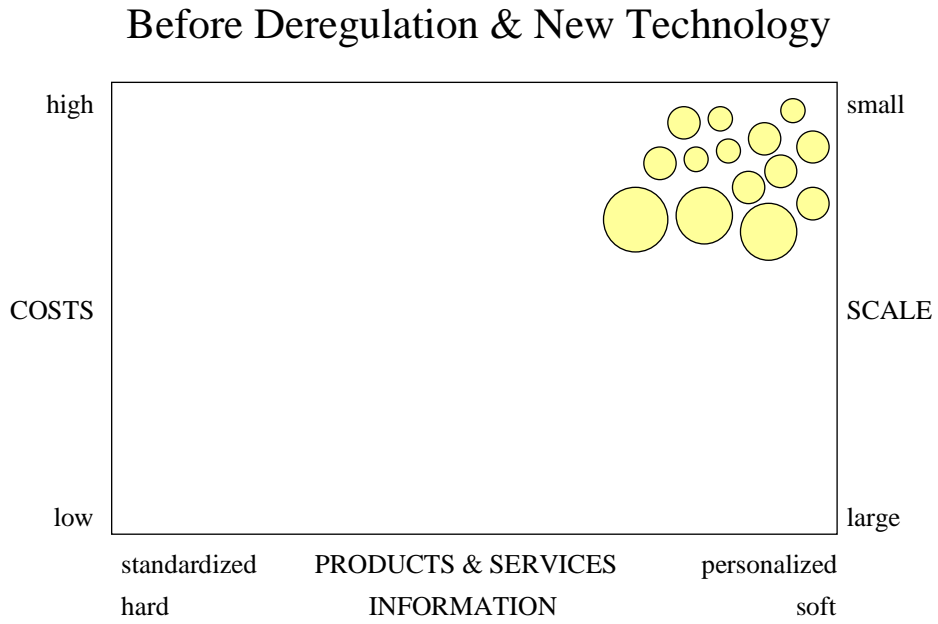


Figure 6

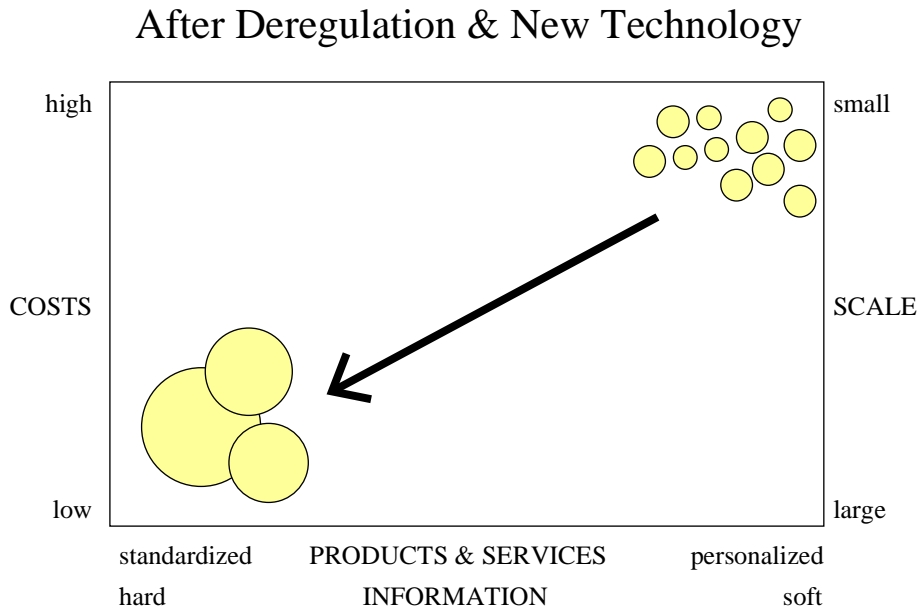


Figure 7

De Novo Entry in Response to Mergers

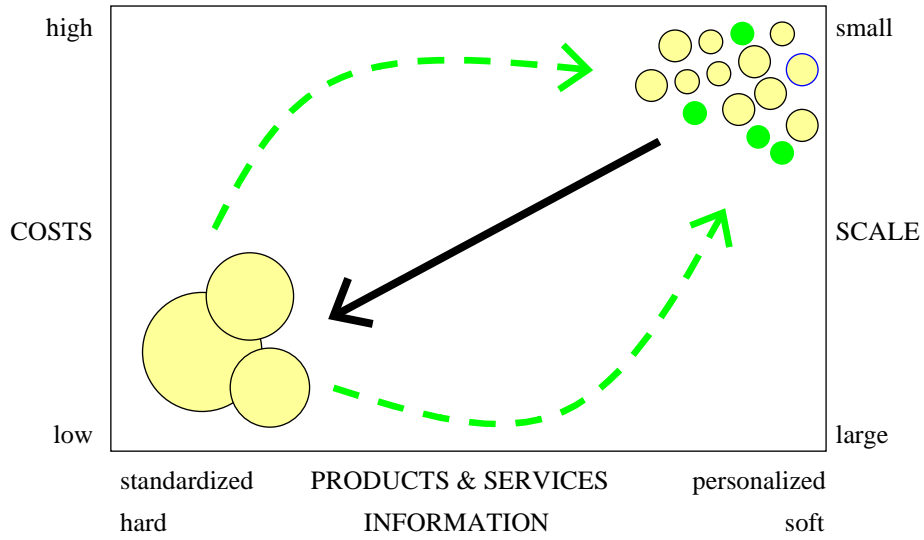


Figure 8

Using Technology to Enhance Position

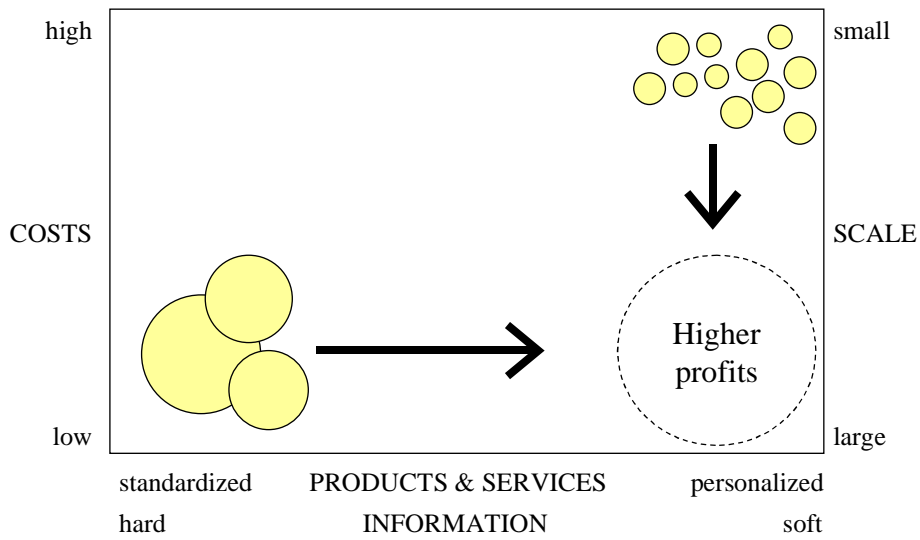
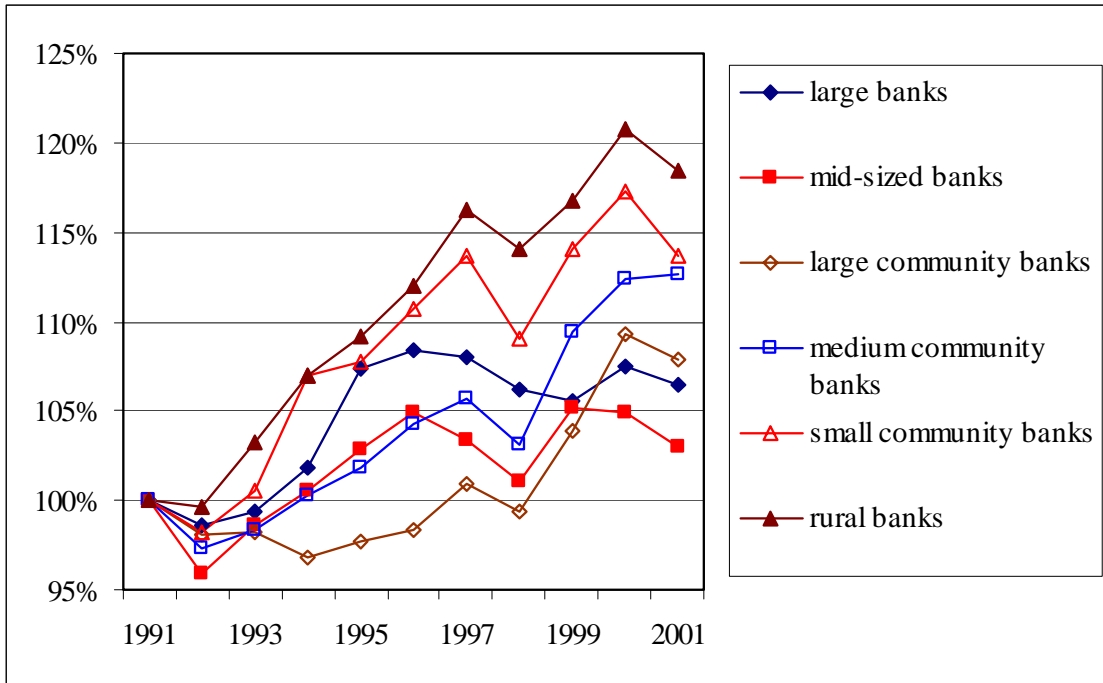


Figure 9

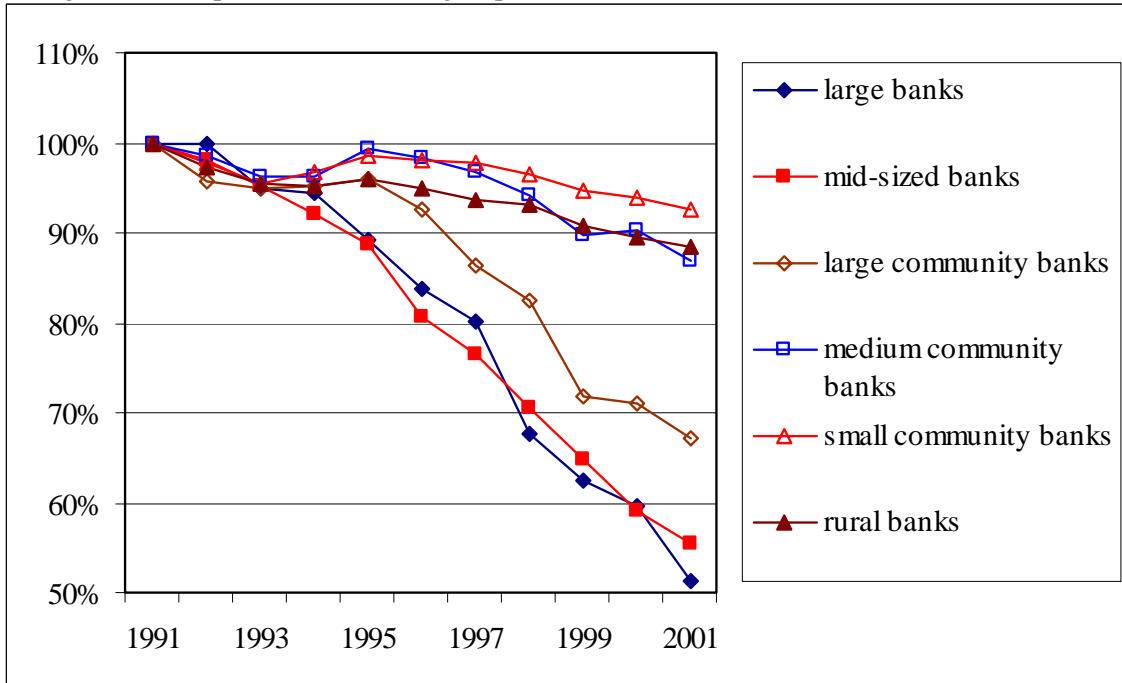
Change in loans-to-assets for groups of U.S. commercial banks, 1991-2001. (1991 = 1.00)



Source: Authors' calculations and FDIC Call Reports.

Figure 10

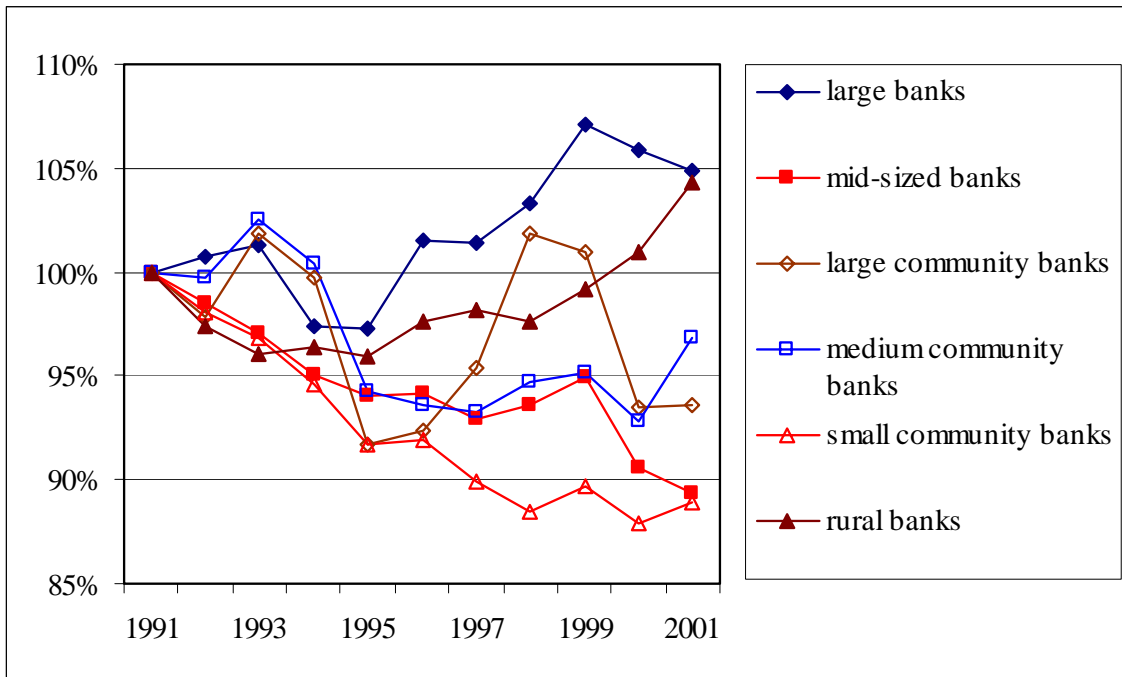
Change in core deposits-to-assets for groups of U.S. commercial banks, 1991-2001. (1991 = 1.00)



Source: Authors' calculations and FDIC Call Reports.

Figure 11

Change in noninterest income-to-operating income groups of U.S. commercial banks, 1991-2001.
Two year moving averages. (1991 = 1.00)



Source: Authors' calculations and FDIC Call Reports.

Appendix Tables A-1 through A-5
Selected Financial Ratios for U.S. Commercial Banks
in 1980, 1985, 1990, 1995 and 2001.

All data are expressed in thousands of 2001 dollars, unless indicated otherwise. There are more financial ratios displayed in the later years because regulators began to collect more data over time and/or because earlier versions of some data are not available in electronic formats. These tables display data for less than the full population of commercial banks in any given year. To be included in these tables, banks had to hold a valid state or federal commercial bank charter; be located in one of the fifty states or the District of Columbia; at least ten full years old; and have positive amounts of loans, transactions deposits, and insured deposits on its balance sheet. Urban banks (i.e., banks located in MSAs) are organized into five asset size categories: small community banks with assets less than \$100 million; medium community banks with assets between \$100 and \$500 million; large community banks with assets between \$500 million and \$1 billion; mid-sized banks with assets between \$1 and \$10 billion; and large banks with more than \$10 billion in assets. Rural banks are included as a separate category, regardless of asset size. To be included in either the rural bank category or in any of the community bank categories, banks had to meet the following additional conditions: they were domestically owned; their credit card receivables (if any) comprised no more than ten percent of their loan portfolios; they derived at least half of their deposits from branches located in a single county; and they were organized as either an independent bank, the sole bank in a one-bank holding company, or an affiliate in a multibank holding company comprised solely of other community banks.

Sources: FDIC Call Reports (1980, 1985, 1990, 1995, 2001); FDIC Summary of Deposits Database (1995, 2000, 2001); and internal FDIC records on transactional banking websites (2001).

Table A-1

2001	Large Banks	Mid-sized Banks	Large Community Banks	Medium Community Banks	Small Community Banks	Rural Banks
number of banks	72	254	144	942	767	3189
assets	\$61,015,633	\$2,803,139	\$669,793	\$222,919	\$55,535	\$99,664
affiliate in a MBHC	65.28%	49.21%	17.36%	10.19%	9.13%	7.40%
affiliate in a OBHC	33.33%	46.85%	72.92%	72.40%	57.63%	72.97%
independent bank	1.39%	3.94%	9.72%	17.41%	33.25%	19.63%
FTEs	1407058.00%	78509.06%	21132.64%	8478.56%	2398.57%	3364.10%
number of offices	41125.00%	3986.22%	1112.50%	539.70%	216.17%	275.82%
<u>Asset items as % of total assets</u>						
cash	6.12%	4.59%	4.53%	5.04%	6.66%	5.72%
securities	17.26%	24.13%	23.93%	22.48%	23.77%	27.08%
federal funds sold	4.84%	4.31%	2.45%	4.10%	6.74%	5.27%
loans	62.49%	61.84%	65.64%	64.60%	59.27%	58.61%
allowance for losses	-4.78%	-2.46%	-1.86%	-1.66%	-1.16%	-1.09%
trading assets	2.17%	0.11%	0.04%	0.01%	0.01%	0.01%
premises	1.03%	1.38%	1.60%	2.04%	2.05%	1.53%
other assets	10.87%	6.11%	3.67%	3.39%	2.65%	2.88%
<u>Composition of securities</u>						
held to maturity	5.43%	11.80%	17.99%	18.86%	24.44%	22.58%
for sale	94.57%	88.20%	82.01%	81.14%	75.56%	77.42%
<u>Composition of loans (sums to more than 100%)</u>						
real estate	45.41%	59.02%	68.52%	70.28%	61.69%	54.27%
agricultural	0.52%	1.17%	1.36%	1.54%	5.99%	15.46%
small agricultural production	0.23%	0.64%	0.83%	1.34%	5.88%	14.85%
commercial and industrial	24.53%	20.78%	18.96%	17.47%	16.99%	14.45%
small business	5.09%	8.41%	11.84%	13.86%	16.17%	13.62%
consumer	17.06%	13.66%	8.46%	9.17%	14.14%	14.40%
credit cards	7.39%	3.23%	0.49%	0.47%	0.33%	0.37%
<u>Liabilities and equity as % of assets</u>						
deposits	56.48%	72.42%	81.14%	84.14%	86.29%	84.69%
federal funds purchased	9.55%	7.00%	3.70%	1.93%	0.72%	0.77%
trading liabilities	0.96%	0.02%	0.00%	0.00%	0.00%	0.00%
other borrowings	12.69%	7.96%	4.98%	3.73%	2.01%	2.81%
liabilities on acceptances	0.06%	0.02%	0.02%	0.01%	0.00%	0.00%
other liabilities	3.11%	1.60%	0.81%	0.75%	0.72%	0.79%
subordinated debt	1.66%	0.40%	0.02%	0.02%	0.01%	0.01%
equity	9.14%	9.35%	9.13%	9.38%	10.25%	10.94%
<u>Composition of deposits (sums to more than 100%)</u>						
transactions	18.19%	16.80%	18.77%	29.03%	32.09%	29.15%
demand	15.88%	13.34%	12.39%	17.66%	18.20%	14.35%
nontransactions	81.81%	83.20%	81.23%	70.97%	67.91%	70.85%
savings	49.71%	44.60%	39.48%	27.86%	22.39%	18.97%
MMDAs	36.43%	29.60%	25.10%	16.66%	11.22%	9.07%
small time	15.74%	22.41%	25.57%	28.00%	32.48%	37.51%
large time	16.36%	16.19%	16.18%	15.12%	13.04%	14.37%
insured deposits	59.96%	67.59%	74.02%	77.92%	85.09%	85.72%
core deposits	33.93%	39.21%	44.34%	57.03%	64.57%	66.66%
average account size	\$38,785	\$72,895	\$21,217	\$19,438	\$11,218	\$9,821

Table A-1 (continued)

2001	Large Banks	Mid-sized Banks	Large Community Banks	Medium Community Banks	Small Community Banks	Rural Banks
<u>Income statement as % of total assets</u>						
interest income	6.06%	6.57%	6.72%	6.85%	6.92%	6.96%
interest expense	2.77%	2.90%	3.00%	2.98%	2.96%	3.23%
net interest income	3.29%	3.67%	3.72%	3.87%	3.96%	3.74%
noninterest income	2.49%	1.74%	1.05%	0.96%	0.92%	0.67%
provisions	0.67%	0.45%	0.29%	0.25%	0.25%	0.25%
noninterest expense	3.37%	3.26%	2.85%	3.17%	3.52%	2.90%
tax expense	0.62%	0.61%	0.49%	0.37%	0.24%	0.27%
net income (ROA)	1.19%	1.14%	1.19%	1.08%	0.90%	1.02%
<u>Composition of noninterest income</u>						
fiduciary	10.26%	12.13%	12.64%	4.79%	1.15%	2.04%
service charges	20.06%	35.63%	41.38%	51.40%	61.77%	63.41%
trading income	22.32%	0.31%	0.16%	0.09%	0.00%	0.00%
nontrading gains	6.23%	4.00%	10.03%	6.62%	3.37%	1.41%
investment bank income	4.78%	4.48%	2.51%	2.21%	0.75%	1.23%
venture capital income	-0.30%	-0.14%	0.12%	0.04%	0.00%	0.00%
loan servicing income	0.73%	2.65%	0.31%	2.24%	1.65%	1.26%
securitization income	4.36%	1.24%	0.17%	0.01%	0.00%	0.06%
insurance income	1.89%	3.27%	1.25%	1.41%	2.39%	4.47%
other noninterest income	29.66%	36.43%	31.43%	31.20%	28.91%	26.11%
<u>Composition of noninterest expense</u>						
salaries and benefits	42.86%	45.72%	53.78%	54.33%	54.74%	56.25%
premises expenses	11.96%	13.42%	14.92%	14.81%	14.05%	13.38%
other noninterest expenses	45.18%	40.86%	31.30%	30.86%	31.20%	30.37%
<u>Other performance, risk, and strategy ratios</u>						
ROE	14.10%	13.25%	13.27%	11.62%	9.16%	9.60%
accounting efficiency ratio	58.92%	60.45%	59.68%	66.19%	71.74%	65.64%
service charges/transactions deposits	5.00%	4.54%	2.92%	2.02%	1.85%	1.76%
assets/FTEs	\$5,405	\$4,623	\$3,773	\$3,039	\$2,508	\$2,791
deposits/FTEs	\$3,073	\$3,137	\$3,074	\$2,478	\$2,156	\$2,347
number of accounts/FTEs	295.87	225.12	204.47	204.95	237.70	267.85
assets/offices	\$2,351,459	\$240,962	\$107,012	\$55,288	\$30,923	\$39,262
deposits/offices	\$605,613	\$115,952	\$86,310	\$45,795	\$26,567	\$32,176
number of accounts/offices	68,084.05	4,910.37	4,761.85	3,574.36	2,831.22	4,942.25
FTEs/offices	549.65	56.84	26.02	18.75	12.60	12.56
operates transactional Internet site	95.83%	75.59%	54.17%	31.53%	7.43%	8.78%
advertising expense/assets	0.11%	0.05%	0.05%	0.04%	0.04%	0.04%
assets securitized/assets *	19.57%	5.34%	0.12%	0.14%	0.00%	0.14%
sells mutual funds	81.94%	64.96%	53.47%	30.04%	10.95%	15.84%
sells proprietary mutual funds	50.00%	14.17%	4.86%	2.23%	0.52%	1.29%
Tier 1 risk-based capital ratio	12.61%	13.22%	13.59%	14.79%	17.52%	18.84%
nonperforming loans/assets	0.89%	0.60%	0.61%	0.65%	0.68%	0.73%
letters of credit/assets	4.50%	1.80%	1.05%	0.59%	0.26%	0.25%
credit derivatives/assets	1.47%	0.00%	0.00%	0.06%	0.00%	0.00%
trading derivatives/assets	156.48%	0.65%	0.03%	0.00%	0.00%	0.01%
nontrading derivatives/assets	31.55%	4.41%	0.71%	0.38%	0.05%	0.23%

* includes only assets sold and securitized with servicing retained or with recourse of other seller-provided credit enhancements.

Table A-2

1995	Large Banks	Mid-sized Banks	Large Community Banks	Medium Community Banks	Small Community Banks	Rural Banks
number of banks	75	302	129	989	1251	3891
assets	\$32,823,803	\$3,181,607	\$692,650	\$210,081	\$50,769	\$67,033
affiliate in a MBHC	85.33%	73.51%	30.23%	12.34%	9.43%	7.48%
affiliate in a OBHC	14.67%	23.51%	55.81%	63.50%	52.84%	64.41%
independent bank	0.00%	2.98%	13.95%	24.17%	37.73%	28.12%
FTEs	8,275.04	1,019.43	277.30	93.62	25.59	28.14
number of offices	219.57	45.73	13.24	5.03	1.94	2.25
<u>Asset items as % of total assets</u>						
cash	7.88%	6.81%	5.86%	5.47%	6.27%	5.17%
securities	15.98%	22.26%	29.85%	29.82%	29.10%	33.87%
federal funds sold	4.17%	4.72%	2.92%	4.45%	6.34%	4.91%
loans	64.18%	62.82%	58.29%	57.13%	55.12%	53.44%
allowance for losses	-1.34%	-1.20%	-0.97%	-0.89%	-0.85%	-0.88%
trading assets	3.22%	0.22%	0.06%	0.05%	0.01%	0.01%
premises	1.31%	1.42%	1.72%	1.90%	1.94%	1.41%
other assets	4.61%	2.95%	2.28%	2.06%	2.05%	2.06%
<u>Composition of loans (sums to more than 100%)</u>						
real estate	35.31%	49.43%	59.85%	63.73%	58.27%	48.38%
agricultural	0.33%	1.20%	1.50%	1.66%	6.92%	19.14%
small agricultural production	0.14%	0.59%	1.00%	1.50%	6.87%	18.90%
commercial and industrial	30.27%	23.03%	21.01%	19.49%	17.27%	14.42%
small business	4.74%	8.21%	12.84%	16.09%	16.30%	13.98%
consumer	19.89%	21.21%	14.75%	13.68%	16.84%	17.23%
credit cards	9.22%	5.69%	1.08%	0.75%	0.53%	0.39%
<u>Liabilities and equity as % of assets</u>						
deposits	57.29%	74.44%	82.35%	87.24%	87.76%	86.90%
federal funds purchased	10.89%	9.06%	4.88%	1.34%	0.73%	0.65%
trading liabilities	0.51%	0.22%	0.16%	0.07%	0.03%	0.03%
other borrowings	8.21%	4.11%	1.46%	0.81%	0.50%	0.60%
liabilities on acceptances	0.49%	0.09%	0.09%	0.02%	0.01%	0.00%
other liabilities	13.48%	3.27%	1.95%	0.93%	0.88%	0.93%
subordinated debt	1.35%	0.38%	0.06%	0.02%	0.01%	0.00%
equity	7.78%	8.42%	9.04%	9.57%	10.07%	10.89%
<u>Composition of deposits (sums to more than 100%)</u>						
transactions	33.08%	31.45%	32.35%	32.23%	33.08%	29.62%
demand	26.36%	21.88%	19.56%	18.70%	18.69%	13.85%
nontransactions	66.92%	68.55%	67.65%	67.77%	66.92%	70.38%
savings	33.75%	29.91%	27.41%	26.39%	23.22%	19.14%
MMDAs	22.85%	18.82%	14.35%	13.27%	10.21%	8.28%
small time	21.79%	26.91%	30.49%	31.04%	34.49%	41.02%
large time	11.38%	11.73%	9.76%	10.34%	9.21%	10.22%
insured deposits	66.58%	74.95%	81.18%	84.62%	89.86%	90.43%
core deposits	54.88%	58.36%	62.83%	63.27%	67.57%	70.65%
average account size	\$26,221	\$29,948	\$137,625	\$12,097	\$10,410	\$8,678

Table A-2 (continued)**1995****Income statement as % of total assets**

interest income	6.95%	7.14%	7.04%	7.31%	7.36%	7.33%
interest expense	3.43%	3.21%	3.04%	3.00%	2.95%	3.27%
net interest income	3.52%	3.93%	4.00%	4.31%	4.41%	4.06%
noninterest income	2.38%	1.54%	1.06%	1.01%	1.12%	0.64%
provisions	0.35%	0.30%	0.17%	0.19%	0.15%	0.14%
noninterest expense	3.64%	3.33%	3.20%	3.48%	3.87%	2.97%
tax expense	0.68%	0.63%	0.52%	0.51%	0.45%	0.46%
net income (ROA)	1.24%	1.20%	1.20%	1.15%	1.05%	1.13%

Composition of noninterest income

fiduciary	17.26%	17.06%	18.62%	6.84%	0.09%	1.21%
service charges	24.34%	34.83%	42.30%	53.61%	63.93%	63.95%
trading income	6.30%	2.16%	1.10%	0.43%	0.03%	0.04%
other fee income	35.91%	31.47%	26.34%	25.21%	23.55%	23.35%
other noninterest income	16.20%	14.48%	11.63%	13.91%	12.40%	11.46%

Composition of noninterest expense

salaries and benefits	41.80%	40.97%	50.40%	51.38%	52.31%	54.84%
premises expenses	12.72%	13.15%	15.20%	14.79%	13.77%	12.76%
other noninterest expenses	45.48%	45.88%	34.40%	33.83%	33.92%	32.40%

Other performance ratios

ROE	16.00%	14.92%	13.49%	11.96%	10.59%	10.51%
accounting efficiency ratio	63.79%	61.18%	62.46%	64.62%	69.30%	63.09%
service charges/transactions deposits	2.07%	2.27%	1.43%	1.58%	1.96%	1.56%
assets/FTEs	\$4,182	\$7,950	\$2,896	\$2,445	\$2,148	\$2,491
deposits/FTEs	\$2,157	\$5,131	\$2,220	\$2,127	\$1,878	\$2,152
number of accounts/FTEs	224.21	339.88	232.77	238.00	264.07	304.08
assets/offices	\$1,815,265	\$262,797	\$77,210	\$55,944	\$31,053	\$32,340
deposits/offices	\$393,742	\$112,241	\$56,528	\$48,462	\$27,102	\$27,908
number of accounts/offices	21,168.29	6,794.77	5,330.08	5,040.86	3,658.33	3,757.76
FTEs/offices	376.37	60.12	29.00	26.61	16.82	14.48

Table A-3

1990	Large Banks	Mid-sized Banks	Large Community Banks	Medium Community Banks	Small Community Banks	Rural Banks
number of banks	64	324	125	944	1400	4899
assets	\$28,352,844	\$3,140,055	\$672,898	\$210,628	\$48,528	\$60,771
affiliate in a MBHC	78.13%	75.31%	31.20%	16.31%	9.93%	6.35%
affiliate in a OBHC	21.88%	21.60%	52.00%	60.28%	51.14%	59.38%
independent bank	0.00%	3.09%	16.80%	23.41%	38.93%	34.27%
FTEs	8,402.20	1,166.97	274.02	97.85	25.63	25.72
<u>Asset items as % of total assets</u>						
cash	11.59%	8.84%	6.59%	6.29%	7.65%	6.95%
securities	14.62%	19.30%	26.42%	27.57%	29.20%	35.57%
federal funds sold	4.22%	4.43%	3.92%	5.05%	7.13%	6.17%
loans	62.89%	63.59%	59.57%	57.41%	52.37%	48.34%
allowance for losses	-1.97%	-1.40%	-1.08%	-0.86%	-0.88%	-0.86%
trading assets	1.73%	0.30%	0.12%	0.07%	0.05%	0.04%
premises	1.41%	1.54%	1.69%	1.88%	1.85%	1.32%
other assets	5.51%	3.40%	2.78%	2.58%	2.63%	2.48%
<u>Composition of loans (sums to more than 100%)</u>						
real estate	33.62%	42.74%	51.82%	56.16%	51.91%	42.95%
agricultural	0.43%	0.80%	1.29%	1.48%	7.52%	20.33%
commercial and industrial	37.09%	26.88%	26.04%	22.95%	19.03%	16.47%
consumer	13.09%	22.13%	16.40%	17.67%	20.73%	19.37%
credit cards	3.44%	5.40%	1.27%	0.74%	0.48%	0.30%
<u>Liabilities and equity as % of assets</u>						
deposits	63.86%	80.50%	85.90%	89.25%	89.73%	88.86%
federal funds purchased	10.99%	8.15%	4.67%	1.27%	0.39%	0.49%
other borrowings	3.95%	1.25%	0.22%	0.10%	0.06%	0.04%
liabilities on acceptances	1.11%	0.14%	0.04%	0.00%	0.00%	0.00%
other liabilities	12.42%	2.61%	1.12%	1.06%	0.99%	1.09%
subordinated debt	0.94%	0.21%	0.14%	0.05%	0.03%	0.01%
equity	5.52%	6.47%	7.42%	7.95%	8.66%	9.40%
<u>Composition of deposits (sums to more than 100%)</u>						
transactions	32.07%	29.20%	26.88%	27.83%	28.98%	26.71%
demand	25.26%	19.51%	16.91%	16.43%	16.01%	12.75%
nontransactions	67.93%	70.80%	73.12%	72.17%	71.02%	73.29%
savings	24.94%	25.12%	25.18%	24.05%	21.74%	16.95%
MMDAs	17.80%	16.38%	15.34%	13.52%	10.62%	8.59%
small time	22.77%	31.07%	32.86%	35.48%	39.49%	46.65%
large time	20.22%	14.62%	15.07%	12.64%	9.79%	9.69%
insured deposits	64.79%	77.48%	82.34%	87.63%	92.89%	93.67%
core deposits	54.84%	60.26%	59.74%	63.31%	68.47%	73.36%
average account size	\$36,865	\$18,184	\$17,081	\$10,952	\$8,224	\$8,480

Table A-3 (continued)**1990****Income statement as % of total assets**

interest income	9.18%	9.00%	8.87%	9.05%	9.14%	9.05%
interest expense	6.18%	5.35%	5.13%	5.10%	5.04%	5.24%
net interest income	3.00%	3.65%	3.75%	3.95%	4.10%	3.82%
noninterest income	1.71%	1.39%	0.90%	0.97%	0.94%	0.61%
provisions	1.12%	1.13%	0.70%	0.51%	0.46%	0.31%
noninterest expense	3.30%	3.44%	3.06%	3.44%	3.78%	2.96%
tax expense	0.12%	0.13%	0.26%	0.27%	0.25%	0.30%
net income (ROA)	0.21%	0.36%	0.65%	0.69%	0.55%	0.85%

Composition of noninterest income

fiduciary	22.85%	22.57%	20.42%	8.17%	0.02%	1.04%
service charges	21.50%	33.15%	40.53%	55.09%	65.90%	61.95%
trading income	6.55%	-3.98%	0.74%	0.30%	0.00%	0.02%
other noninterest income	49.09%	48.27%	38.31%	36.44%	34.07%	36.98%

Composition of noninterest expense

salaries and benefits	46.49%	42.72%	48.89%	49.37%	49.83%	52.25%
premises expenses	15.82%	14.39%	15.16%	15.06%	14.14%	12.57%
other noninterest expenses	37.69%	42.88%	35.95%	35.57%	36.03%	35.18%

Other performance and strategy ratios

ROE	10.79%	3.19%	14.67%	4.13%	-21.02%	9.07%
accounting efficiency ratio	69.62%	68.89%	65.31%	69.27%	74.35%	66.87%
service charges/transactions deposits	1.62%	1.59%	1.36%	1.77%	2.23%	1.57%
assets/FTEs	\$3,906.02	\$7,894.31	\$2,963.30	\$2,339.49	\$2,076.98	\$2,484.57
deposits/FTEs	\$2,189.88	\$2,319.74	\$2,294.21	\$2,082.45	\$1,856.19	\$2,199.13
number of accounts/FTE	189.21	251.62	251.89	290.59	350.60	360.51

Table A-4

1985	Large Banks	Mid-sized Banks	Large Community Banks	Medium Community Banks	Small Community Banks	Rural Banks
number of banks	49	336	130	1170	1794	5881
assets	\$34,231,081	\$2,987,255	\$683,923	\$201,923	\$48,737	\$56,544
affiliate in a MBHC	61.22%	68.15%	39.23%	13.16%	5.63%	3.54%
affiliate in a OBHC	38.78%	28.27%	43.08%	55.73%	45.60%	50.69%
independent bank	0.00%	3.57%	17.69%	31.11%	48.77%	45.77%
FTEs	10,244.67	1,258.90	303.38	99.79	26.52	24.69
<u>Asset items as % of total assets</u>						
cash	15.11%	12.30%	9.38%	8.23%	8.65%	7.70%
securities	10.86%	18.43%	24.56%	28.01%	29.31%	33.67%
federal funds sold	2.94%	5.51%	5.66%	5.44%	6.83%	6.92%
loans	62.90%	59.69%	57.07%	54.59%	51.44%	48.12%
allowance for losses	-0.91%	-0.79%	-0.74%	-0.70%	-0.67%	-0.74%
trading assets	1.95%	0.35%	0.07%	0.05%	0.03%	0.04%
premises	1.29%	1.64%	1.76%	1.98%	1.98%	1.43%
other assets	5.88%	2.88%	2.23%	2.41%	2.42%	2.85%
<u>Composition of loans (sums to more than 100%)</u>						
real estate	20.63%	29.76%	36.85%	42.54%	42.05%	34.15%
agricultural	0.77%	1.02%	1.36%	1.73%	8.14%	23.04%
commercial and industrial	41.12%	32.19%	31.57%	28.52%	21.96%	19.29%
consumer	14.34%	23.16%	20.51%	23.96%	27.10%	22.11%
credit cards	4.71%	5.20%	1.87%	0.70%	0.32%	0.14%
<u>Liabilities and equity as % of assets</u>						
deposits	55.52%	77.74%	85.24%	88.75%	89.15%	88.81%
federal funds purchased	12.89%	9.42%	4.84%	1.64%	0.55%	0.41%
other borrowings	4.67%	1.74%	0.97%	0.50%	0.23%	0.15%
liabilities on acceptances	3.21%	0.36%	0.06%	0.01%	0.00%	0.00%
other liabilities	17.64%	4.35%	1.63%	1.35%	1.24%	1.33%
subordinated debt	0.80%	0.30%	0.14%	0.10%	0.06%	0.04%
equity	5.26%	6.09%	7.13%	7.65%	8.78%	9.27%
<u>Composition of deposits (sums to more than 100%)</u>						
transactions	38.59%	33.02%	29.98%	28.33%	28.35%	26.14%
demand	33.52%	25.93%	22.42%	19.52%	18.12%	14.80%
nontransactions	61.41%	66.98%	70.02%	71.67%	71.65%	73.86%
savings	22.60%	27.12%	26.89%	28.02%	24.92%	18.80%
small time	15.97%	22.43%	26.68%	30.18%	36.42%	45.99%
large time	22.84%	17.43%	16.45%	13.46%	10.31%	9.08%
insured deposits	62.62%	76.16%	80.82%	87.41%	92.51%	93.91%
core deposits	54.56%	55.45%	56.66%	58.51%	64.77%	72.12%

Table A-4 (continued)**1985****Income statement as % of total assets**

interest income	8.61%	8.69%	9.13%	9.59%	10.06%	10.17%
interest expense	5.68%	5.24%	5.47%	5.53%	5.66%	6.04%
net interest income	2.92%	3.45%	3.66%	4.05%	4.40%	4.13%
noninterest income	1.22%	1.23%	0.89%	0.83%	0.88%	0.55%
provisions	0.58%	0.49%	0.53%	0.62%	0.70%	0.99%
noninterest expense	2.77%	3.32%	3.15%	3.31%	3.65%	2.92%
tax expense	0.18%	0.16%	0.13%	0.21%	0.25%	0.15%
net income (ROA)	0.67%	0.75%	0.82%	0.83%	0.77%	0.70%

Composition of noninterest income

fiduciary	20.89%	21.66%	24.23%	7.24%	0.00%	0.74%
service charges	20.34%	30.92%	38.72%	55.12%	62.14%	57.70%
trading income	9.23%	3.29%	1.71%	0.34%	-0.01%	0.02%
other noninterest income	49.54%	44.13%	35.33%	37.30%	37.87%	41.54%

Composition of noninterest expense

salaries and benefits	50.42%	47.66%	49.96%	50.18%	50.57%	52.24%
premises expenses	16.34%	15.75%	15.99%	15.98%	15.34%	13.90%
other noninterest expenses	33.24%	36.59%	34.05%	33.84%	34.08%	33.89%

Other performance ratios

ROE	12.59%	11.96%	15.02%	-0.46%	5.12%	7.83%
accounting efficiency ratio	66.00%	70.66%	69.36%	67.17%	68.49%	62.51%
service charges/transactions deposits	1.06%	1.23%	1.24%	1.71%	2.07%	1.41%
assets/FTEs	\$3,840	\$2,741	\$2,468	\$2,173	\$2,023	\$2,420
deposits/FTEs	\$1,900	\$1,980	\$2,093	\$1,924	\$1,800	\$2,145

Table A-5

1980	Large Banks	Mid-sized Banks	Large Community Banks	Medium Community Banks	Small Community Banks	Rural Banks
number of banks	35	286	167	1146	2070	6947
assets	\$44,204,656	\$2,764,589	\$695,942	\$207,300	\$47,580	\$56,516
affiliate in a MBHC	31.43%	45.45%	17.37%	5.24%	1.30%	0.59%
affiliate in a OBHC	65.71%	35.66%	31.74%	25.39%	20.63%	22.10%
independent bank	2.86%	18.88%	50.90%	69.37%	78.07%	77.31%
FTEs	11,740.34	1,329.49	361.62	113.47	27.97	27.07
<u>Asset items as % of total assets</u>						
cash	24.03%	15.71%	11.77%	9.36%	8.94%	8.34%
securities	10.25%	21.07%	26.22%	29.73%	30.87%	31.14%
federal funds sold	2.32%	5.63%	6.46%	4.73%	6.32%	6.56%
loans	53.57%	52.41%	51.42%	52.60%	51.21%	51.27%
allowance for losses	-0.56%	-0.60%	-0.56%	-0.53%	-0.49%	-0.48%
premises	1.01%	1.76%	2.01%	2.09%	1.98%	1.51%
other assets	9.39%	4.02%	2.68%	2.02%	1.17%	1.65%
<u>Composition of loans (sums to more than 100%)</u>						
real estate	17.23%	31.99%	37.71%	42.15%	40.84%	33.62%
agricultural	0.90%	1.33%	1.83%	2.07%	9.68%	25.15%
commercial and industrial	46.50%	34.37%	31.97%	27.76%	19.50%	17.53%
consumer	11.51%	25.30%	26.60%	28.86%	31.31%	23.89%
credit cards	3.01%	5.51%	2.19%	1.01%	0.34%	0.15%
<u>Liabilities and equity as % of assets</u>						
deposits	50.09%	76.50%	83.05%	87.23%	89.00%	89.17%
federal funds purchased	10.25%	10.22%	6.60%	2.57%	0.72%	0.50%
other liabilities	34.57%	6.55%	2.86%	2.09%	1.33%	1.21%
subordinated debt	0.62%	0.52%	0.45%	0.32%	0.18%	0.11%
equity	4.47%	6.22%	7.04%	7.80%	8.76%	9.01%
<u>Composition of deposits (sums to less than 100%)</u>						
demand	42.85%	38.59%	34.43%	30.77%	30.84%	28.83%
large time	32.37%	21.38%	19.76%	14.60%	8.89%	7.93%
<u>Income statement as % of total assets</u>						
total revenue	10.57%	10.00%	9.92%	9.81%	9.88%	9.64%
total expense	9.74%	9.03%	8.75%	8.54%	8.38%	7.96%
provisions	0.26%	0.29%	0.22%	0.24%	0.27%	0.24%
net income (ROA)	0.51%	0.77%	0.91%	1.01%	1.14%	1.26%
<u>Composition of various noninterest income and expense items as % of assets</u>						
fiduciary	0.20%	0.23%	0.16%	0.09%	0.04%	0.01%
service charges	0.09%	0.21%	0.23%	0.31%	0.37%	0.22%
salaries and benefits	1.15%	1.59%	1.54%	1.59%	1.74%	1.50%
premises expenses	0.34%	0.51%	0.50%	0.49%	0.48%	0.36%
<u>Other performance ratios</u>						
ROE	11.17%	12.20%	13.12%	12.45%	12.87%	13.34%
assets/FTEs	\$4,019	\$2,252	\$2,139	\$1,988	\$1,894	\$2,298
deposits/FTEs	\$1,880	\$1,648	\$1,762	\$1,733	\$1,686	\$2,049

Endnotes

¹ For a cross-country analysis of the importance of small banks to aggregate economic activity and the health of small and midsized enterprises in both developed and developing nations, see Berger, Hasan and Klapper (2004).

² Hannan and Prager (forthcoming) take a similar geographic markets approach to identify “single-market banks,” which they define as drawing over 90 percent of their deposits or branches from a single state or a single Metropolitan Statistical Area (MSA).

³ The only exceptions were cross-border banking organizations that existed under grandfathered arrangements.

⁴ See Table B6 in Berger, Kashyap and Scalise (1995).

⁵ These states were referred to as unit banking states. Unit banking laws restricted banks to a single location although in some cases, such as in Illinois, this restriction could be partially pierced by forming groups of banks with common stockholders.

⁶ Data based on the total number of FDIC-insured U.S. commercial banks from the FDIC website.

⁷ Data from the Federal Reserve Flow of Funds Accounts.

⁸ For a discussion of the relative risk of consumer lending by banks and finance companies see chapter 6 in Cornett and Saunders (1999).

⁹ Throughout most of the past three decades, commercial banks were prohibited from making individual loans larger than 15 percent of their book value equity capital. Smaller banks can originate loans larger than their legal lending limit if they sell a participation in the loan equal to or greater than the amount by which the loan exceeds the legal lending limit. Such participations were often sold to a community bank’s correspondent bank. From a practical perspective, however, this arrangement usually complicated the lending relationship because the loan officer had to obtain approval from two loan committees, her own and that of the correspondent bank. This additional layer of complexity often reduced flexibility in negotiating with the borrower and when renegotiation was an issue.

¹⁰ Both in the 1970s and today, businesses that use asset-based finance tend to be highly leveraged (Carey, Post, Sharpe 1998, Udell 2003). The high leverage typically stems from either rapid growth, a leveraged buyout, or financial distress.

¹¹ For a discussion of asset-based finance including factoring see Udell (2003).

¹² Arguably, the McFadden Act was never the kind of binding constraint on wholesale banking that it was on retail banking. International banking services could be delivered out of single home office. Commercial lending could be delivered on a national level through local loan production offices. Loan production offices were essentially interstate branches for commercial lending. These offices were permitted during the McFadden Act era so long as they did not engage in deposit-taking (Ritter, Silber

and Udell 1999). To solve the checking account problem, large companies would establish checking accounts at local banks and then transfer these funds on a systematic basis to a primary account(s) with the company's main bank. Large banks offered sophisticated cash management systems to minimize the costs associated with maintaining these local accounts (see Kallberg and Parkinson 1993). For smaller companies, McFadden was not much of a constraint anyway, because these businesses obtain their banking business locally (see, for example, Ang (1992).

¹³ See Berger, Kashyap and Scalise, Table B6 (1995).

¹⁴ See Cornett and Saunders, p. 613 (1999).

¹⁵ The implicit government subsidy of Fannie Mae and Freddie Mac can directly alter the price of mortgages purchased and held by these two GSEs for their own portfolios. However, because the subsidy takes the form of an implicit guarantee of Fannie and Freddie's own debt, it is not directly related to the mortgage-backed securities (MBS) that these two GSEs sell to investors. Fannie's and Freddie's GSE status does however indirectly subsidize MBS to the extent that investors view these GSE-originated MBS as being implicitly guaranteed by the government and thus do not demand from the GSEs the credit enhancements that investors demand from competing privately originated MBS.

¹⁶ There is one published study that has done a more focused analysis on whether human intervention can improve decisionmaking on applicants who are rejected on the basis of credit scoring. This study, based on data from one bank with an historically high "override" rate, found that "overrides" of applicants that would have been rejected just on the basis of the credit score did not do any better on average than their credit score alone predicted (Mays 2003, Chapter 12).

¹⁷ For an analysis of the power of credit scoring as a business lending tool and the use of information exchange generated information in a credit scoring model see Kallberg and Udell (2003).

¹⁸ A form of credit scoring based on the original Altman Z-score model has been available for middle market and large business lending since the 1970s. However, even today, credit scoring does not appear to be used as the primary underwriting criteria in these segments of the commercial market although there is evidence of its adoption by larger banks in the 1980s as an important tool in their loan review activities (Udell 1987).

¹⁹ See, for example, Cornett and Saunders (1999) for a discussion of asset-liability management techniques.

²⁰ See Saunders (1999) for a discussion of credit risk models.

²¹ Small banks will be treated differently under the New Basle Capital Accord primarily because it is felt that it will be infeasible for them to meet the data and technology requirements necessary to calculate their PDs and LGDs. At this stage it also appears possible that the U.S. will only adopt the advanced version of the new capital requirements (the "Advanced Internal Ratings Based Approach") and that it

will only be used by approximately the largest 20 banks. Even if the U.S. were to adopt the “Standardized Approach,” it would be on balance only a marginal change from current capital requirements. There is also an intermediate version, the “Foundation Internal Ratings Based Approach,” which may not be adopted by the U.S. It is possible that either under current standards, or under the Standardized or Foundation approaches, that small banks will find themselves with higher capital requirements than the largest banks who opt for the Advanced Internal Ratings Approach. Given that small banks have historically had much higher proportionate capital levels, however, it is not clear that this will affect the competitive position of small banks.

²² See Berger, Hancock and Marquardt (1996), Hancock and Humphrey (1998) and Berger (2003) for a more extensive review of the literature electronic payments.

²³ Based on internal records compiled by the Federal Financial Institutions Examination Council (FFIEC).

²⁴ For more extensive discussions and analyses of the causes and consequences of consolidation in the banking and financial services industries see Berger, Demsetz and Strahan (1999) and Berger, DeYoung, Genay and Udell (2000).

²⁵ Data from the FDIC website.

²⁶ Tables 1 and 2 represent an alternative to analyzing the decline in banking by looking at the size of the banking industry relative to other financial institutions (e.g., Boyd and Gertler 1994). By looking at the users of financial services (in this case, consumers) as we do in Tables 1 and 2, we avoid problems of determining the appropriate metric for measuring the size of different financial intermediaries including such issues as how to weigh off-balance sheet activities.

²⁷ For example, total bank assets are often used as a measure of the size of the banking industry. However, over the past two decades a considerable fraction of bank activities are not reflected on the balance sheet, i.e., off-balance sheet activities.

²⁸ The benefit comes in the form of a reduction of in the liquidity premium (e.g., Silber 1991, Longstaff 1995).

²⁹ Based on data from the Federal Reserve Y-9C Bank Holding Company reports and the FDIC Call Reports.

³⁰ See Berger and Udell (1998) and Boot (2000) for a more detailed discussion and reviews of the literature on relationship lending.

³¹ There have been some recent studies that have found that the average distance between lenders and borrowers has decreased over recent decades suggesting that the technology of small business lending may have changed and that these changes may have diminished the importance of having a local lender (Petersen and Rajan 2002, Degryse and Ongena 2002). However, the distances involved are very small as are the measured transportation costs associated with these distances (Udell 2002).

³² The \$250,000 figure corresponds to the reported maximum loan level of the micro business loan market (e.g., Berger, Frame and Miller 2002). The \$15,000,000 figure is somewhat more arbitrary but is meant to correspond with the maximum loan that could be made by the largest bank that could fall under the most expansive definition of a community bank.

³³ See Berger and Udell (2002) and Scott (2004) for analyses of the importance of the borrower-loan officer relationship in relationship lending.

³⁴ Technology appears likely to have had some impact on asset-based lending and factoring. Because these technologies involve the daily monitoring of collateral, particularly the receivables, the computational power of computers and the ability to transmit turnover activity instantaneously has likely improved the quality of monitoring of these loans and lowered the cost, although there is no hard data on this (Udell 2003).

³⁵ This description of small business lending as being composed of relationship lending, asset-based lending, micro-business lending and financial statement lending is based on the taxonomy in Berger and Udell (2002).

³⁶ There is also evidence that community banks earn a higher risk-adjusted yield on small business lending than large banks (Carter, McNulty and Verbrugge 2004). This result is consistent with community banks having an advantage in assessing the soft information associated with relationship lending. It is also consistent with relationship lending requiring a higher risk-adjusted yield because of the increased costs associated with collecting soft information.

³⁷ For a discussion of differences in monitoring and renegotiation across small, medium and large borrowers, see Carey, Prowse, Rea and Udell (1994).

³⁸ There are theoretical arguments that increased competition in banking might diminish the quality and nature of relationship lending (Petersen and Rajan 1995, Boot and Thakor 2000, Dinc 2000, and Ceterelli and Peretto 2000). The empirical evidence that increased competition hinders access to relationship lending, or lending in general, is quite mixed. See Beck, Dermirguc-Kunt and Maksimovic 2003 and Berger, Hasan and Klapper 2004 for recent empirical evidence and a review of the theoretical and empirical work on this issue.

³⁹ See Berger, Hanweck, and Humphrey (1987), Mester (1987), Clark (1988), Hunter, Timme and Yang (1990), Hunter and Timme (1991), Evanoff and Israilevich (1991), Clark (1996), and Berger and Mester (1997) for reviews of the bank scale economy at various points in time.

⁴⁰ For an analysis of the role of advertising in the commercial banking industry, see Ors (2003).

⁴¹ See DeYoung (1999, 2000) for a recent summary of the causes and consequences of bank mergers in the U.S.

⁴² It should be noted, however, that unlike small business lending, there does not appear to be any systematic empirical evidence that community banks have an advantage over large banks in delivering private banking service.

⁴³ It is not yet clear whether Internet-only banking will be a viable business model, and if so, whether it will feature small, medium, or large banks. See DeYoung (forthcoming) for some findings and a discussion.

⁴⁴ Tables A-2 through A-5 follow the same format for year-end 1995, 1990, 1985, and 1980 data (expressed in 2001 dollars), although fewer ratios are included for these later years in which bank regulatory agencies collected less complete information from banks.

⁴⁵ The reported numbers for credit card loans at community and rural banks are somewhat depressed by our sample selection method, which excluded community and rural banks at which credit card loans comprised more than 10 percent of the loan portfolio. We ran these numbers again without this sampling constraint, which resulted in average credit card loans-to-total loans ratios of between 0.5 percent and 2 percent for these banks.

⁴⁶ Securitized assets and securitization income refer to definitions from individual lines of the 2001 bank Call Reports, which are not necessarily inclusive of all securitization activities at commercial banks.

⁴⁷ Consistent with the implication of these aggregate statistics, Craig and Thomson (2003) find evidence that community banks are not constrained in their small business lending by a lack of deposit funding. On this basis they reject the funding-driven market failure justification for allowing Federal Home Loan Bank lending to community banks.

⁴⁸ Rural banks are outliers here with an average cost of funds of 3.23%. This likely reflects a relative scarcity of funds in rural towns coupled with a strong dependence by rural banks on local deposit relationships, especially small time deposits.

⁴⁹ Carter, McNulty and Verbrugge (2004) take this analysis further and find that the risk adjusted yield on small business lending is higher at smaller banks than larger banks.

⁵⁰ The enormous discontinuous leaps in these ratios between mid-sized banks and large banks imply that the largest banks are using a very different business model, e.g., different production processes, distribution channels, and output mixes.

⁵¹ Risk-reduction from diversification is typically associated with large banks, who can hold large loan portfolios and operate in multiple geographic and product markets. But diversification benefits also occur at community banks. Emmons, Gilbert, and Yeager (2004) performed a simulated bank merger exercise using data from community banks in the 1990s, and found that post-merger risk reductions stemmed more from increased bank size (reduced exposure to idiosyncratic risk) than from geographic diversification (reduced exposure to local market risk). Stiroh (2004) finds that community banks benefit from

diversification within broad activity classes like traditional lending, but do not benefit from diversification across broad activity classes.

⁵² Although it is virtually impossible to trace changes in bank technology over time using publicly available data, there are some recent empirical studies that investigate technology adoption by banks, and for the most part the results of these studies are consistent with our strategic framework. For example, Furst, Lang, and Nolle (2002) and Courchane, Nickerson, and Sullivan (2002) both study the diffusion of Internet websites at commercial banks; both studies find that large bank size is a strong indicator of adoption, but they also find a number of environmental and strategic determinants. Both White and Frame (2002) and Berger (2003) have reviewed the literature on technology and technology adoption in commercial banking.

⁵³ The figure shows that rural banks greatly increased their reliance on noninterest income during the 1990s, but this is likely because they started at such a low ratio of noninterest income-to-operating income in 1991 (just 12 percent).

⁵⁴ Similarly, Avery and Samolyk (2004) find that incumbent community banks tend to gain market share in local markets that experience consolidation by merger.

⁵⁵ We calculate the Sharpe Ratio as the excess return over the risk-free rate (average ROE minus the average annual rate on constant maturity one-year T-Bills) divided by the standard deviation of ROE.

⁵⁶ Accounting practices at small owner-operated banks may cause the results in Table 4 to understate the relative earnings of small community banks and rural banks. These banks sometimes reduce their recorded profits (and hence reduce their corporate income taxes) by paying owner-managers high salaries and bonuses. However, such practices would also tend to smooth reported earnings over time, which reduces the standard deviation of those earnings and increases the Sharpe Ratio. We explored this possibility by recalculating Table 4 after excluding small community banks and rural banks that were organized independently. The results did not materially change.

⁵⁷ It may also be inappropriate to compare ROE at owner-operated community banks to ROE at other banks because the owner-managers of these banks sometimes pay themselves higher salaries and bonuses to avoid double taxation of the owner's earnings, which reduces reported ROE. See DeYoung, Spong, and Sullivan (2001).

⁵⁸ A more recent attempt along these lines was made by Robertson (2002).

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