Internet Banking:
Market Developments and Regulatory Issues

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John Carlson, Karen Furst, William W. Lang, and Daniel E. Nolle*
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*The opinions expressed in this article are those of the authors alone, and do not necessarily represent those of the Office of the Comptroller of the Currency or the United States Treasury Department. Contact author: Daniel Nolle at daniel.nolle@occ.treas.gov.

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Abstract

Internet banking is a subject receiving great attention in the banking industry and the regulatory community. As with other areas of e-commerce, discussions about Internet banking often proceed without reference to the actual state of market developments. This paper describes the current state of Internet banking and discusses its implications for the banking industry and regulatory policy. At the end of 2000, a minority of banks offered Internet banking, but analysis of data collected by Office of the Comptroller of the Currency bank examiners shows that over half of all banks will offer Internet banking by year-end 2001. As a group, large banks are more likely to offer Internet banking, although a growing number of small banks offer it, or plan to. Nevertheless, large banks appear to have an advantage over small banks in the range of services they offer over the Internet. An empirical examination of bank profitability indicates that, at this point in time, Internet banking is not having an independent impact on bank profitability. This result may of course change as the use of Internet banking grows. Use of Internet banking, while forecast to grow significantly, is still relatively modest. We argue that the modest use of Internet banking by consumer customers of banks is due in large part to a lack of a compelling value-added proposition. This problem is less severe for Internet banking customers and may explain why some banks are targeting their Internet strategies toward business customers. Nevertheless, since most consumers have accounts at banks that offer Internet banking, consumer usage patterns could change suddenly.

Internet banking's impact on consolidation in the banking industry is uncertain. The economics of Internet banking may favor large institutions, either because of economies of scale and scope, or because of the need to advertise heavily to be successful. Alternatively, Internet banking could offer entry and expansion opportunities that small banks traditionally lacked. Internet banking presents policy makers and regulatory authorities with a set of significant challenges. Changes to the structure and functioning of financial institutions are challenging a regulatory structure that was developed based on increasingly outdated lines of demarcation among types of financial institutions. In addition, existing regulatory policies have to be adapted to the new realities of e-commerce as Internet banking accentuates or lessens various existing public policy concerns, and in some cases, raises entirely new concerns. Finally, traditional methods of safety and soundness supervision must adapt to the changing nature and scope of risks, and the possible creation of new types of risks for banks.

I. Introduction

Internet banking is a subject receiving great attention in the banking industry and the regulatory community. To some extent, the intense interest in Internet banking reflects a more general interest in the role of the Internet as a vehicle for commercial activity. However, interest in Internet banking may be particularly keen since a strong case can be made that banking, along with other financial services, provides a particularly fertile environment for the development of e-commerce. At its core, banking involves the collection, storage, transfer and processing of information assets, and the Internet is an incredibly powerful and efficient tool for handling these information processes.

Some analysts argue that Internet banking is revolutionizing the banking industry. Others see the Internet as simply adding another delivery channel for remote banking to existing channels such as automated teller machines (ATMs) and telephone banking. As with other areas of e-commerce, discussions about Internet banking often proceed without reference to the actual state of market developments. While Internet banking is the subject of a large amount of industry discussion, it remains the case that only a small percentage of banking transactions are done online, and only about a third of all banks currently offer Internet banking. Nevertheless, the adoption of Internet banking by banks has grown at a very rapid pace, and many banks, including some of the nation's largest institutions, have made the development of services over the Internet a major component of their business and marketing strategy.

The purpose of this paper is to describe the current state of Internet banking and to discuss its implications for the banking industry and regulatory policy. The next three sections provide information on Internet banking market developments. Section II describes the Internet banking "landscape" in the United States, drawing heavily on information collected by Office of

the Comptroller of the Currency (OCC) national bank examiners. Section III explores whether Internet banking has had a noticeable impact on bank performance. Our regression analysis indicates that, so far, Internet banking has not had a significant impact on bank profitability. Section IV summarizes information collected by OCC examiners on the Internet banking plans of national banks, and briefly considers industry estimates of potential "demand" for Internet banking. Section V turns to implications Internet banking may have for banking industry structure, and for bank regulation and supervision. Section VI concludes.

II. The Internet banking in the United States: current landscape[1]

Despite popular impressions, and the rapid growth in the number of banks offering Internet banking since the beginning of the "Internet era" in financial services several years ago, a minority of banks in the United States offered transactional Internet banking as 2001 began.[2] For purposes of this paper, we define a bank as offering "transactional" Internet banking if it provides the ability for bank customers to transact business (e.g. access accounts and transfer funds, apply for an account or a loan). By "Internet bank" we mean any bank offering Internet banking, including, but not limited to, "Internet-only" banks.[3] In this section we analyze structure and performance characteristics of Internet banks and "non-Internet banks" (i.e., banks that do not offer transactional Internet banking, even if they have a Web site).

[1] This section of the article draws heavily on Furst, Lang, and Nolle (2000).

[2] Furst, Lang, and Nolle (2000) note that some consider the "Internet banking era" to have begun only several years ago; and, indeed, at the end of 1997 only about 100 banks and thrifts offered transactional Internet banking.

[3] Note that a new term, "Internet-primary," has begun to be used by regulators. This reflects the recent shift in thinking in the market toward the notion that some, perhaps limited, physical presence may enhance remote delivery of financial services. As of the beginning of 2001, only about two dozen banks and thrifts were "Internet-primary."

Figure 1 indicates that somewhat over one-third of national banks offered transactional Internet banking by Q4 2000.[4] That represents a substantial increase over the 6 percent of national banks that offered Internet banking in Q2 1998, but is still well below a majority of banks. Nevertheless, banks offering Internet banking account for over 90 percent of banking system assets and over 85 percent of small deposit accounts. That is because most large banks offer transactional Internet banking. At the same time, proportionally few small banks offer transactional Internet banking. Both of these points are illustrated in Figure 2.

Furst, Lang, and Nolle (2000) identify key differences between Internet banks and non-Internet banks. Within size classifications, banks that offer Internet banking have higher concentrations in business and credit card loans, rely less on deposits relative to purchased funds, and have higher ratios of noninterest income to net operating revenue. Taken together, these characteristics indicate that Internet banks are less reliant on traditional banking activities and take a more aggressive business posture relative to non-Internet banks of similar size.[5]

For most size categories, Internet banks also have higher returns on equity (ROE) and lower noninterest expenses as a ratio of net operating revenue. However, this pattern is reversed for small banks under $100 million in assets. When *de novo* banks are included, banks in the smallest size category are both less profitable and less efficient than non-Internet banks. Removing *de novos* from the small size eliminates the discrepancy between the profitability of small Internet banks and small non-Internet banks. That is, *de novo* banks offering Internet banking were significantly less profitable and less efficient than non-Internet *de novos*. It is

[4] Data for Q3 1999, Q2 2000, and Q4 2000 are from a detailed questionnaire answered by OCC examiners for active national bank charters. We believe these data for the nationally chartered portion of the banking industry are representative of the whole (nationally-chartered plus state-chartered) banking industry. See Furst, Lang, and Nolle (2000) for details on pre-Q2 2000 data.

[5] See in particular Furst, Lang, and Nolle (2000), Tables 7 and 8.

possible that new banks offering Internet banking have adopted a business strategy based on a belief that demand for banking services will grow rapidly in the near term. It is also possible that these institutions made relatively substantial investments in Internet banking products and marketing based on the belief that a higher than normal payoff in the future will more than offset near-term costs. Clearly, it will be useful to obtain more information on the business strategies of these young Internet banks and to track the performance of these banks over time in order to determine the extent to which performance matches expectations.

Among transactional Internet banks, a key difference between large and small banks is that large banks offer a wider range of online banking services. For example, Furst, Lang, and Nolle (2000) show that in Q3 1999, 58.5 percent of Internet banks that were $10 billion or greater in assets offered a package of Internet banking services that included balance inquiry, funds transfer, electronic bill payment, and at least three other Internet banking services. By contrast, only 14.1 percent of Internet banks of $100 million or less in assets offered such a "premium" package of Internet banking services.[6]

There are two other significant differences between small and large banks offering Internet banking. For banks under $100 million in assets, there appear to be start-up hurdles to overcome in offering Internet banking.[7] Furst, Lang, and Nolle (2000) found that even after excluding *de novo* banks from the group of banks under $100 million in assets, "Internet inexperienced" small banks were less cost efficient than non-Internet banks.[8] For banks larger

[6] See Furst, Lang, and Nolle (2000) for a detailed discussion of small bank/large bank differences in the range of Internet banking services.

[7] These start-up hurdles may include both direct and indirect costs related to technology. Direct costs include licensing fees for Internet banking software and investments in hardware. Indirect costs include modifications to existing systems to allow for the integration of information between various systems or service providers.

[8] "Internet inexperienced" banks are those banks adopting Internet banking after Q2 1998. See in particular Furst, Lang, and Nolle (2000), Table 12.

than $100 million in assets, length of experience in offering Internet banking did not affect efficiency.

A final important difference between small and large Internet banks is in their different emphases on business-oriented Internet banking services. As of Q2 2000, for example, 49 percent of Internet banks in the over-$10 billion size category, and 30 percent of the Internet banks in the $1 billion to $10 billion size category offered business cash management services, roughly double the corresponding percentages from Q3 1999.[9] In contrast, only 14 percent of Internet banks with less than $100 million in assets offered online cash management, unchanged from Q3 1999. Indeed, there are frequent reports in the business press announcing new or expanded business Internet banking services being offered by large banks.[10] A general theme in those accounts is that large banks are targeting small and medium size enterprises. Given the traditional financial ties between small banks and small businesses, the more aggressive Internet banking strategies of large banks may have particularly important competitive consequences for small banks.

III. Does Internet banking have an impact on bank profitability?

Using a logit regression model, Furst, Lang, and Nolle (2000) find that, except for the smallest size banks, Internet banks are more profitable than non-Internet banks. They suggest that this is likely due to a business strategy less focused on "plain vanilla" banking, and more focused on, for example, fee-generating activities. They also speculate that it is probably too soon to see a systematic impact of Internet banking on banks' profitability. In this section we

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[9] The Q2 2000 figures are from data compiled by the Office of the Comptroller of the Currency for all national banks. See Furst, Lang, and Nolle (2000), Table 5, for the Q3 1999 information.

estimate a multivariate regression model to investigate whether there is a link between offering Internet banking and a bank's profitability. We regress a bank's return on equity in Q3 1999 against a set of control variables, and include as an explanatory variable whether or not a bank offers Internet banking. We also test to see whether this relationship differs for more experienced Internet banks relative to new Internet banks.

The chief focus of our investigation is to see if Internet banking has an independent impact on bank profitability. We create a dummy variable (INTERNET) that equals one if the bank offered Internet banking in Q3 1999, and include this variable as a regressor in explaining ROE. Our hypothesis is that Internet banking is still too small a factor to have affected bank profitability; hence, our expectation is that the coefficient on this variable will not be statistically significant.

Table 1 presents the results of ordinary least squares regressions using various regressors in explaining ROE, both for all national banks (specifications 1 through 3), and for small national banks (specifications 4 through 7). Specification 1 enters only the INTERNET variable in the regression. This specification is just reporting the simple correlation between Internet and profitability without controlling for other relevant factors. The results from this simple specification indicate no simple correlation between Internet banking and profitability.

Specifications 2 and 3 check to see if the finding of no relationship between Internet banking and profitability is robust when we control for factors commonly used in models estimating profitability.[11] Our set of control variables in specification 2 include total assets (ASSETS), a dummy variable indicating that the bank is less than three years old (YOUNG), the

[10]See, e.g., O'Brien (2000) and Ptacek (2000).
[11]See, for example, Berger (1995) and Samolyk (1994) and the studies cited therein.

lagged equity capital-to-assets ratio (CAPASSETS)[12], and the loan-to-assets ratio (LOANASSETS). Specification 3 expands our control variables to include the ratio of noninterest income to net operation revenue (NIINCOME), the ratio of expenditures on premises and fixed assets to net operating revenue (EXPENSES), our measure of accounting inefficiency (INEFFICIENCY), and noncurrent loans to total loans (CREDQUAL). All of the explanatory variables are measured as of Q3 1999 (with the exception of the lagged capital-to-assets ratio, which is calculated as of Q2 1998).[13] Both of these specifications fail to indicate a relationship between the existence of Internet banking and profitability.

The analysis in Furst, Lang, and Nolle (2000) indicated that the relationship between Internet banking and profitability might be different for banks with assets less than $100 million. Thus we separately analyzed regressions for this set of banks. Specification 4 is again the simple correlation between Internet banking and ROE at small banks. The estimated correlation is negative and, unlike the model for all banks, has a low p-value. In light of the discussion above that small banks may face more of a challenge than larger banks when they first offer Internet banking, we made an adjustment to specification 4 by entering separate dummy variables for banks that adopted Internet banking as of Q2 1998 (OLD INTERNET) and those adopting after Q2 1998 (NEW INTERNET). The results of this specification are reported in column 5 of the table. Interestingly, while there is clearly no statistical relationship between profitability at smaller banks and OLD INTERNET, the relationship between NEW INTERNET and profitability at small banks is negative with a p-value of 10%.

[12]We lag the capital-to-assets ratio because of the simultaneity between current earnings and current capital.

[13]The 5-quarter lag follows the procedure Furst, Lang, and Nolle (2000) used in their logit estimation of factors explaining the adoption of Internet banking. As they explain, the time periods selected were to some extent an artifact of the available data.

However, as reported in specifications 6 and 7, the significance of NEW INTERNET completely disappears when we add in our other control variables. This suggests that the difference in profitability of OLD INTERNET and NEW INTERNET small banks is not due to the existence of Internet banking, but rather due to the different conditions at those banks offering Internet banking before and after Q2 1998. This is consistent with our earlier discussion indicating that more profitable institutions are quicker to adopt Internet banking.

The conjecture that Internet banking is not likely to have yet had a big impact on the bottom line of most banks receives some support from the regression analysis. However, it is important to keep in mind two caveats to this general conclusion. First, there may be small subsets of banks for which this result does not hold. As we discussed in the previous section, it is possible that Internet banking is having a significant impact on the profitability of very young (a year or less old) Internet banks. In addition, there are a very small number of large institutions that currently dominate the market for customer usage of Internet banking.[14] It is possible that Internet banking is having an impact on this handful of institutions. Second, our results are not necessarily "timeless." It is likely that Internet banking will eventually become a very important factor affecting bank performance for many banks. The speed at which this may happen will depend, in part, on the future emphasis banks place on Internet banking, as well as on the growth in the use of Internet banking. We turn to the issue of the Internet banking plans of banks in the next section.

[14]At the end of 1999, five large banks accounted for 36 percent of the online banking customers. See Furst, Lang, and Nolle (2000), especially Table 19, for detailed discussion.

IV. The future of Internet banking

Recent OCC analysis of the Internet banking activities of national banks includes information on examiners' knowledge of bank's plans for future online activity.[15] Figure 3 summarizes current and planned offering of Internet banking by national banks. That diagram shows that in addition to the 37 percent of national banks that offered Internet banking by Q4, 2000, 18 percent more have concrete plans to offer transactional Internet banking by the end of 2001. Hence, on current plans, by the end of 2001, slightly over half (55 percent) of banks will offer Internet banking.

Because most large banks already offer Internet banking, most of the growth in the number of banks offering Internet banking will be among small banks. Nevertheless, important differences will continue to exist between small banks and large banks. As Figure 4 shows, approximately one-third of banks in the under-$100 million group plan to offer Internet banking in the near future, but that percentage is still well below the percentages in the large size groups. In addition, small Internet banks will continue to lag larger Internet banks in the range of online services they offer. Using electronic bill presentment as a representative "premium" Internet banking service, Figure 5 shows that despite substantial planned online services growth by small Internet banks, they may still be only one-half to one-third as likely to offer electronic bill presentment as larger banks. In a similar vein, the smallest size Internet banks' plans to increase their business Internet banking offerings look set to leave them substantially behind larger banks in this respect. Figure 6 illustrates the discrepancy.

The data in Figure 3 also indicate that almost half -- 45 percent -- of all national banks currently have no concrete plans to offer Internet banking. If current plans are an accurate

[15]See Office of the Comptroller of the Currency (2000) for summary information.

reflection of the future, then as Figure 7 shows, the banking industry would be divided into Internet "haves" and Internet "have-nots," with most of the "have-nots" being small size banks. It is unlikely that the "have-not plateau" will persist indefinitely if, as expected, there is substantial growth in customer demand for Internet banking. However, the relatively large number of small institutions with "no plans" may not be weighing carefully the implications of the Internet for their business strategy. Even though our results above indicate that current bank profitability is not significantly influenced by the adoption of Internet banks, there are several significant strategic considerations that should be weighed in determining plans for developing an Internet banking service and the type of services that should be offered.

First, bank management must evaluate the degree to which current and future market demand for Internet banking services warrant a change in their Internet banking plans. Market analysts estimate that current consumer use of Internet banking is relatively modest, but many also expect a surge in the use of Internet banking over the near-term, as illustrated in Figure 8. Even so, it is interesting to juxtapose two observations. On the one hand, most households currently bank at a bank that offers Internet banking; it is therefore possible that most bank customers could switch rapidly to Internet banking.[16] On the other hand, even the most optimistic forecasts foresee only a partial adoption of Internet banking by consumers.

The relatively modest consumer use of Internet banking raises the question of how compelling the value-added proposition is for Internet banking for consumer customers of banks. The costs savings that consumers expect to get from banking on the Internet do not appear to be as great, for example, as the reduction in cost from switching to online brokerage, where customers can reduce brokerage fees from nearly $100 per trade at a traditional broker to perhaps

[16]As noted above, over 85 percent of all small deposit accounts -- a measure of "household" accounts -- are at banks that offer Internet banking.

$10 per trade online. This suggests that a breakthrough in consumer usage of online banking may depend on developing new and better services rather than reducing the price of standard banking products. It also suggests that low demand for Internet banking may be responsible for the "wait and see" posture of some banks toward offering Internet banking.

However, there are reasons to distinguish between *consumer* demand for Internet banking and *business* demand for Internet banking. As Furst, Lang, and Nolle (1998; 2000) have pointed out, cost savings from the electronification of commercial transactions could be substantial simply because of the level of transaction activities relative to consumer activities. Thus, there is a compelling economic case for significant growth in demand for Internet banking services by banks' business customers. To the extent that Internet banking offers significant value to business customers, banks that remain on the Internet banking sidelines may risk losing business customers to banks with a more aggressive Internet strategy.

A second consideration for banks in determining when, and how deep, to plunge into Internet banking is the likely future competitive pressure generated by the development of the Internet. Banks face competition not only from their traditional rivals within the banking industry, but may increasingly find their market share threatened by banks from new, distant locations. In addition, nonbank firms -- financial and nonfinancial -- will increasingly contest banks for their most valuable customers.

A third strategic consideration in developing Internet plans is the question of whether there are "early adopter" advantages. Some analysts point to the high market concentration of Internet banking customers in a few large banks as evidence that there will be a few big winners, and that laggards will have difficulty catching up. Furst, Lang, and Nolle (2000) show that at the end of 1999, five large banking companies (Wells Fargo, Bank of America, Bank One Corp.,

Citibank, and First Union Corp.) accounted for an estimated 35.8 percent of all online banking customers.[17] Proponents of the early-adopter-advantage-view also argue that Internet banking will increase the extent to which economies of scale and scope can be realized, and that early adopters will better position themselves to exploit them.[18] Furthermore, it may be that many Internet banking customers are "sticky;" that is, once they have absorbed the costs of switching some or all of their banking transactions to a particular provider's online environment, they will be reluctant to incur new start-up costs to switch to another system.

On the other side of the issue, there is little evidence so far that leaders in online customers are earning excess profits. In addition, the increasing ease with which customers can comparison shop among alternative (bank and nonbank) suppliers of Internet banking services may offset customer stickiness. Further, because of the rapid pace and broad scope of technological change in banking and payments, today's early adopter advantage in capturing customers using the current set of Internet banking options may suddenly be undermined by the introduction of a new technology.

V. Internet banking: implications for banking and bank regulation

V.A. Implications for banking industry structure and performance

Globalization and increased competition are trends that have shaped the banking industry for decades. The expansion of Internet banking will contribute to those trends in the same way that previous advancements in telecommunications and data processing did; i.e., by reducing barriers associated with geography and national boundaries. Many markets that were once

[17]See Furst, Lang, and Nolle (2000), Table 19.

[18]Radecki, Wenniger, and Orlow (1997) make this point about remote electronic distribution of banking services in general.

highly localized (mortgage finance in the United States, for example) have become national and sometimes international in scope. Not only will competition be enhanced by the reduction of geographical barriers, but also by the increased ability of bank customers to search for and locate new suppliers electronically.

Internet banking will also accelerate the ongoing process of “financial deepening" (i.e. the widening applicability of more formalized financial markets in the economy). Traditionally, small, start-up firms, for which little information necessary to evaluate creditworthiness existed, were unable to secure external funding in formal credit markets, including banking. Often entrepreneurs have to seek funds from relatives, friends or private credit markets. Technological advancements in data collection, data management, and financial engineering have improved the ability of potential creditors to assess the creditworthiness of potential borrowers and to price the risk associated with those borrowers through standardized mechanisms such as credit scoring. As a result, the range of businesses and individuals that can obtain loans through financial institutions is expanding rapidly. Credit scoring is based on an analysis of information that can be entered into a standardized database, and thus it avoids the costs associated with customized loan products. Standardized credit scoring is easily transferable to multiple lenders or potential lenders, a process that eliminates any economic rents created when credit depends on specialized knowledge of a lender with respect to a particular borrower. The result is greater access and lower cost for borrowers who qualify for this type of lending.

The impact of Internet banking on the consolidation of the banking industry is less clear-cut. The Internet is an extremely efficient device for banks of all sizes to collect and manage information in order to meet the various financial needs of individuals and businesses, in particular by integrating services or “bundling” them together. On the one hand, the Internet

allows financial firms of different sizes to enter markets and reach customers previously out of reach to them. On the other hand, there are substantial economies of scale and scope in data storage and data processing, and larger banks are better positioned to exploit these scale and scope economies than smaller banks. In addition, the proliferation of Internet Web sites means there may be a substantial advantage for banks able to distinguish their products from those of other banks (i.e., to engage in "branding"). Doing so will require significant resources for advertising and marketing, a fact that is likely to work to the advantage of large firms. These factors could boost both the pace and scope of consolidation in the banking industry.

However, even if the growing use of the Internet favors large banks, these banks must choose between alternative Internet-based business strategies. The Internet provides a very effective searching device for consumers to choose the "best of breed" producers of specialized services. Intermediaries may play a role in helping users locate the "best" product given their individual preferences for quality, convenience, and price. While economies of scale imply that information warehousing and processing will be highly concentrated, these functions will not necessarily be integrated into an individual banking firm. Rather, they may be performed by third parties that service the needs of highly specialized and focused financial firms. Thus, it is not clear whether the Internet will provide a larger impetus to increased focus or to greater conglomeration. Most likely, both types of business strategies will co-exist in the market place with some banking customers preferring the convenience of one-stop shopping, while others prefer the lower costs or higher quality products produced by specialized financial service providers.

V. B. Implications for regulatory policy

There are several ways in which the development of Internet banking generates potential challenges for regulatory policy. First, Internet banking, and developing technology more generally, is changing the structure and function of financial institutions. Our existing regulatory structure has been developed based on traditional lines of demarcation among different types of financial institutions, but these lines of demarcation are becoming less relevant over time. Second, Internet banking may raise either new concerns or, more likely, accentuate or lessen concern about existing public policy issues. The most prominent example of a public policy concern accentuated by Internet banking has been the issue of privacy. Third, Internet banking challenges traditional methods of safety and soundness supervision by changing the nature and scope of existing risks, and possibly by creating new risks. Finally, the nature and scope of technological change may require authorities to rebalance their emphases on regulatory rules and industry discretion.

V. B. 1. The impact of financial integration on regulation and supervision

Technological advances make it increasingly desirable and easy to offer a wider range of services for some institutions. Improvements in the ability to integrate financial products and more efficiently market and cross-sell are major advantages of the online environment. But the wider the range of services offered by banks, the more intricate becomes the tasks of identifying which lines of business banks are engaged in, and the more difficult it becomes to coordinate supervision among functional supervisors.[19]

Technological advances are also resulting in a greater penetration of traditional banking lines of business by nonbanks, including unregulated/less regulated entities. Regulators could potentially saddle these firms with burdensome regulation. On the other hand, to the extent

customer trust is important for establishing and augmenting customer relationships, greater regulation and supervision may give banks a competitive edge. It is not clear how these effects will net out.

In addition, policy makers are now struggling with adapting existing regulations and integrating new laws to the world of Internet banking. They must determine the appropriate balance between meeting regulatory objectives, and avoiding unnecessary costs and distortions that will harm the development of Internet banking and electronic commerce. Much of the current regulatory and supervisory apparatus governing the operations of banks was designed based on physical location. That is, to service existing customers and to expand their customer base, both within a nation and internationally, banks could be expected to establish a physical presence within, or in relatively close proximity to, the geographic area where their customers are located.

As Internet banking expands in importance, policy-makers will have to address a number of questions arising from possible conflicts between traditional notions of "place" and the new concept of "cyberspace." For example, in the case of Internet banking across national borders, do the laws of the "home country" (i.e., the country where the Internet bank is licensed) apply to issues such as consumer protection, or do the laws of the "host country" (i.e., the country where the bank customer resides) apply? Further, would harmonization of national laws and regulations as they apply to cross-border Internet banking be a useful policy? On the one hand, harmonization could reduce the uncertainty and costs of compliance with multiple national regulations. On the other hand, harmonization might short circuit valuable experimentation with alternative regulatory designs. Moreover, it may be difficult to design regulations that are "technology neutral," resulting in regulatory policies that favor existing technologies over newer

[19]See Claessens, Glaessner, and Kligebiel (2000) on this point.

or yet to be developed technologies. Such questions do not necessarily have easy answers, and policy-makers are likely to grapple with them well into the future, as electronic banking and electronic commerce increase in importance.

V. B. 2. Privacy

There is growing public concern over the collection and use of personal information by the private sector. This issue has particular importance for the banking industry and other sectors of the financial services industry. The safeguarding of customer information and personal privacy has long been a major issue for the financial services industry, an industry whose currency is the access to and use of financial information. Consolidation of the banking industry and the expanding scope of products offered by financial services firms means that the industry will be responsible for maintaining and safeguarding huge databases containing extensive information on individuals.

Banks are not alone in expanding the scale and scope of personal information collected and processed. The development of modern computer and communications technology has tremendously enhanced the efficient collection and use of personal information for commercial purposes. This increased commercial value of personal data has led to a huge increase in the scale and scope of personal information collected and sold. The Acommoditization of information≅ is in many ways a tremendous boon to consumers and businesses. Producers are able to fine tune products to individual customers, and marketers are better able to offer customers a package of services tailored to individual characteristics. But there is a growing tension between the commercial interest in developing information assets on the one hand, and the public=s increasing concern over privacy on the other hand.

When bank customers open an account, apply for loan application, or use a bank credit

card, they entrust a bank with personal financial and lifestyle information. This exchange of information is fundamental to the business of banking, and the success of the banking system has depended in part on customers' trust and confidence that personal financial information will remain confidential. Banks have garnered this trust through a long history of protecting confidential customer information. A bank that does not protect this information could suffer damage to its reputation as well as potential financial liability.

However, the new realities of the market are placing competitive pressures on banks that could eventually erode the reputation of the industry. For example, banks face increased attempts from Ainformation brokers≅. Traditionally, banks have been mainly concerned with unauthorized access for withdrawing or transferring funds. Because of the increased value of personal information, there are growing attempts to gain unauthorized access to customer information.[20]

Legislation such as the Gramm-Leach-Bliley Act, the Electronic Funds Transfer Act, the Fair Credit Reporting Act, and other laws contain provisions and requirements governing the disclosure of consumer information by banks and other private entities.[21] The recent promulgation of regulations is not likely to be the end of the debate on financial privacy. Consumer groups have expressed the opinion that there are too many loopholes and flaws in Title V of the Graham-Leach-Bliley Act to provide meaningful privacy protections for consumers. Further, the problem of identity theft is becoming more severe as technology increases the ability of criminals to electronically impersonate an individual. Members of Congress and the executive branch continue to debate these issues and call for the passage of

[20]See OCC Advisory Letter 98-11 *Pretext Phone Calling.*

[21]See OCC Bulletin 2000-25 *Privacy Laws and Regulations.*

stronger privacy laws. Additionally, a number of states have recently enacted privacy laws that specifically relate to the disclosure of consumer financial information.[22] The industry may need to recalibrate the current balance between security and convenience in light of these new realities.

V. B. 3. Safety and soundness supervision

There are at least two broad safety and soundness "themes" that will grow in importance as the supply of and demand for Internet banking increase: system security and vendor management. We discuss each of these in turn.

Security.[23] Most observers agree that as electronic banking becomes more widespread and complex, the necessity for banks to assess and manage operational risks will become more crucial. Security failure at a particular institution could not only cause large losses for that institution, but could spawn a general lack of confidence in electronic banking innovations, thereby retarding development. In addition, and unlike in the case of other remote banking channels such as telephone banking, security risks surrounding the Internet may be especially challenging to address, because the Internet is a network designed to promote open access.

Regulators have warned financial institutions that the risk of breaches in security and intrusions is increasing as the number of remote access devices increases. Risks and threats in the digital world appear to mirror those in the physical world -- threats to bank information systems may be facilitated internally by disgruntled, dishonest, or poorly trained insiders, or externally by hackers and thieves using increasingly sophisticated and widely available tools and techniques. Few banks have experienced serious breaches of their security system, but a major

[22]Title V of the Graham-Leach-Bliley Act does not preempt state laws that provide greater protection of consumer privacy than that provided by the Act.

breach could undermine consumer or market confidence in the bank's ability to manage Internet-based transactions. Poor security may also create reputational or legal risks for banks that are seen as providing inadequate protection for customers' personal data.

Security-related risks could be compounded if processes to authenticate customers online are inadequate. As financial institutions search for new and more convenient ways of using technology to open Internet banking accounts online (instead of having to fill out a paper application, sign it, and mail it), they also must address how to limit fraud and security vulnerabilities.

Vendor Management. The development of Internet banking has made banks increasingly reliant on third party service providers. There are significant economic advantages to decomposing the "production" of banking and payment services; and, indeed, many small and medium size banks would find it impossible to independently provide many bank technology "inputs" (such as creation of an Internet banking Web site). For example, larger banks may rely on third parties to provide products and services outside of their core competencies, whereas smaller banks may outsource because they lack the necessary technical expertise and resources to build and maintain an Internet banking delivery platform on their own. However, the greater banks' reliance on outsourcing, the more dependent the safety and soundness of individual banks, and the banking system, become on third party service providers, many of which are not part of a regulated industry. This presents policy makers with the challenge of balancing access to, and oversight of, nonbank technology companies on the one hand, and avoiding excessive expansion of bank regulation and supervision to such firms on the other hand.

[23]A number of aspects of system security are discussed in the recently completed *Interagency Guidelines Establishing Standards for Safeguarding Customer Information.*

V. B. 4. Rules versus Discretion

An additional broad policy consideration is balancing when to establish rules versus allowing financial institutions to develop their own non-regulatory approaches to manage new risks ("rules versus discretion"). Rapid changes in technology make it difficult to design hard and fast regulatory rules and supervisory policies; such an effort could result in obsolete, or at least obsolescent policies. It is even possible that seemingly well-designed regulatory and supervisory policies could retard or distort desirable market developments. At the same time, while maintaining considerable flexibility may be desirable, relying on industry discretion requires supervisory authorities to maintain expertise to evaluate industry decisions on a case-by-case basis. A too great reliance on industry discretion may overtax regulators' resources.

VI. Conclusion

Our analysis shows that a minority of banks currently offer Internet banking, but that is expected to top 50 percent by year-end 2001. As a group, large banks are more likely to offer Internet banking, although a growing number of small banks offer it, or plan to. Nevertheless, large banks appear to have an advantage over small banks so far in the range of services they offer over the Internet. Across most size categories of banks, Internet banks are more profitable than non-Internet banks, but there is no evidence that there is a causal relationship between offering Internet banking and bank profitability.

Use of Internet banking, while forecast to grow significantly, is still relatively modest. On the consumer customer side, the so-far modest take-up of Internet banking may be due to a lack of a compelling value-added proposition, a problem that may not be applicable for potential

business Internet banking customers. Nevertheless, most consumers bank at banks that offer Internet banking, and so usage patterns could change suddenly.

Internet banking could have significant effects on the structure and performance of the banking industry. If the economics of Internet banking favor large institutions, either because of increasing economies of scale and scope, or because of the need to advertise heavily in order to be successful, the consolidation of the banking industry that has been proceeding steadily for the past fifteen years could become more intense. Alternatively, Internet banking could offer entry and expansion opportunities that small banks lacked previously.

Internet banking presents policy makers and regulatory authorities with a set of significant challenges. Changes to the structure and functioning of financial institutions are challenging a regulatory structure that was developed based on increasingly outdated lines of demarcation among types of financial institutions. In addition, existing regulatory policies have to be adapted to the new realities of e-commerce as Internet banking accentuates or lessens various existing public policy concerns, and in some cases, raises entirely new concerns. Finally, traditional methods of safety and soundness supervision must adapt to the changing nature and scope of risks, and the possible creation of new types of risks for banks.

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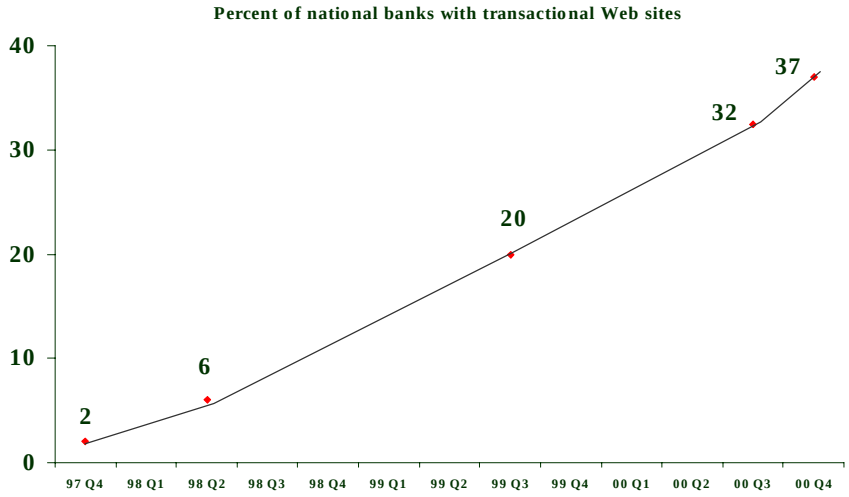
Figure 1.
Substantial growth of transactional Internet banking

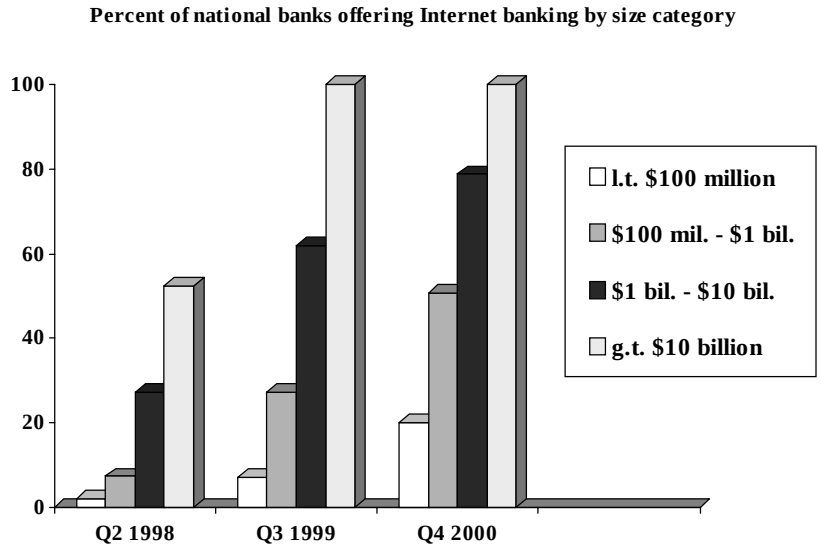


Source: Office of the Comptroller of the Currency

Source: Office of the Comptroller of the Currency

Figure 2.

Small banks lag far behind large banks in offering Internet banking

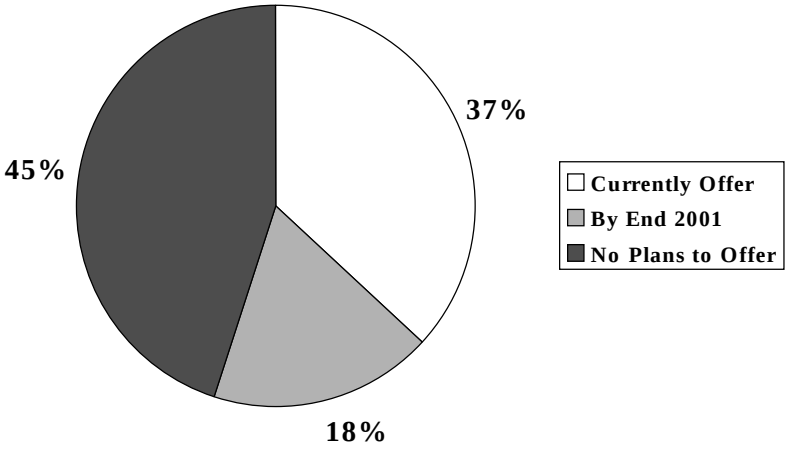


Source: Office of the Comptroller of the Currency

Figure 3.

Internet banking and national banks: current use and planned growth

Percent of national banks with transactional Internet banking
(as of fourth quarter, 2000)

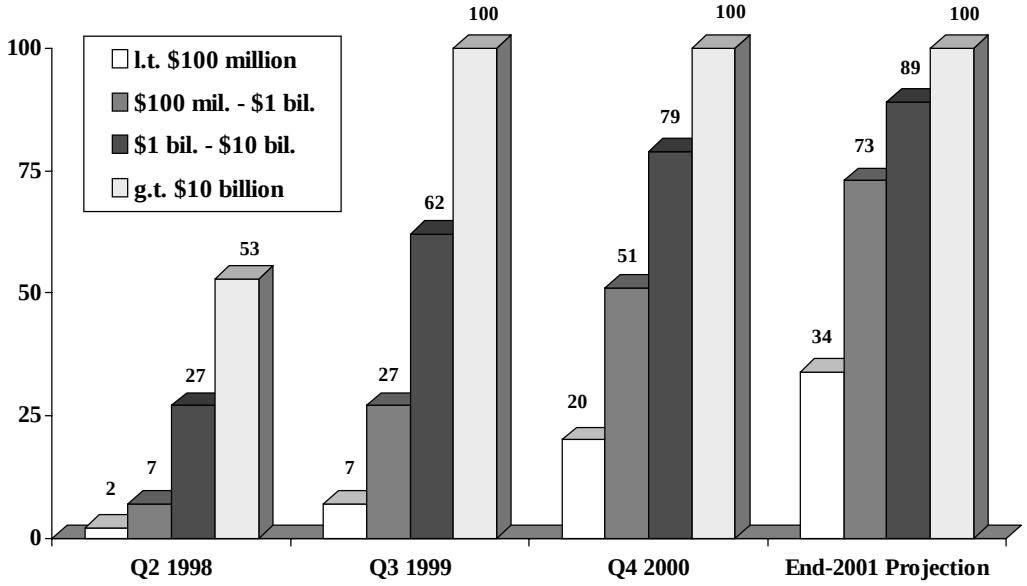


Source: Office of the Comptroller of the Currency

Figure 4.

Projections: small banks will still lag large banks in offering Internet banking

Percent of national banks offering Internet banking by size category

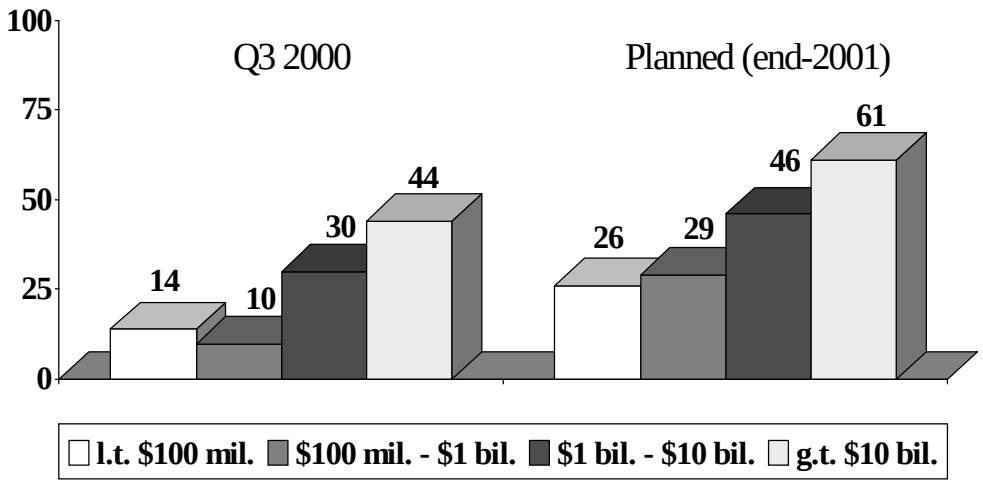


Source: Office of the Comptroller of the Currency

Figure 5.

Small banks will continue to lag in range and variety of Internet services

Percent of transactional national banks offering bill presentment

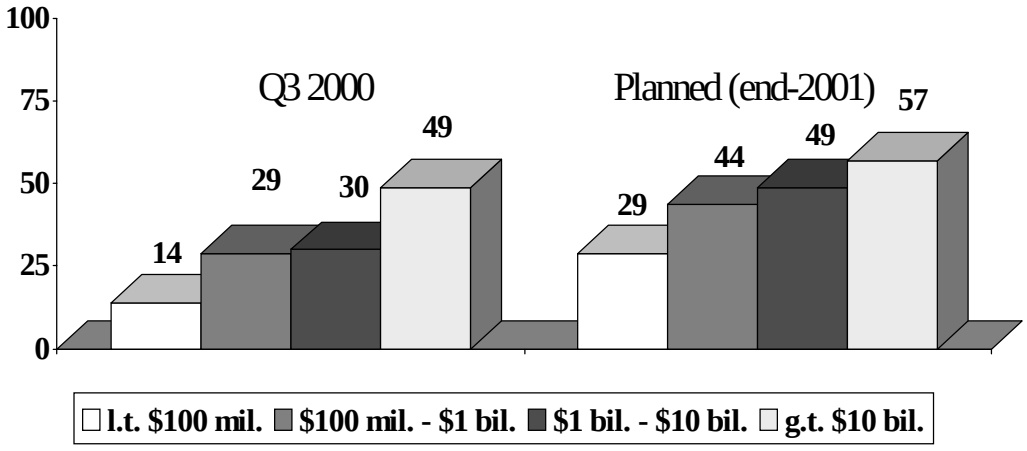


Source: Office of the Comptroller of the Currency

Figure 6.

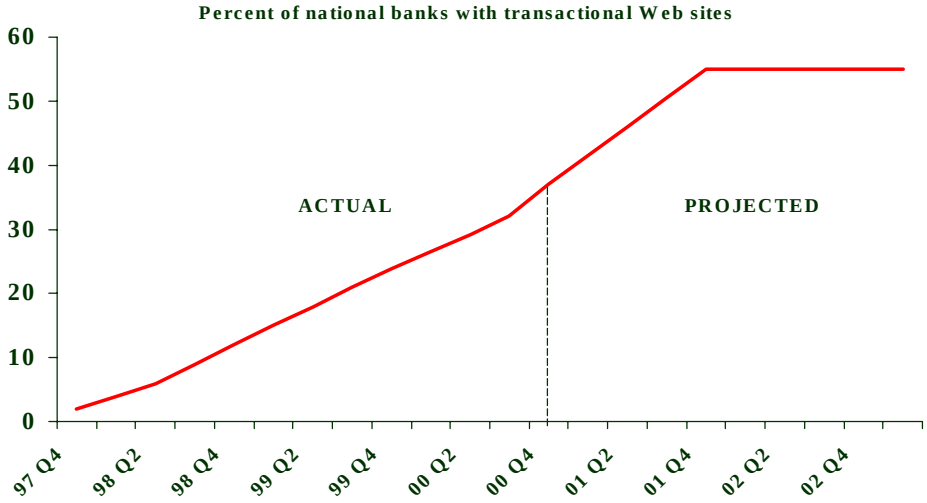
Will small banks lose business customers to large banks via the Internet?

Percent of transactional national banks offering business cash management services



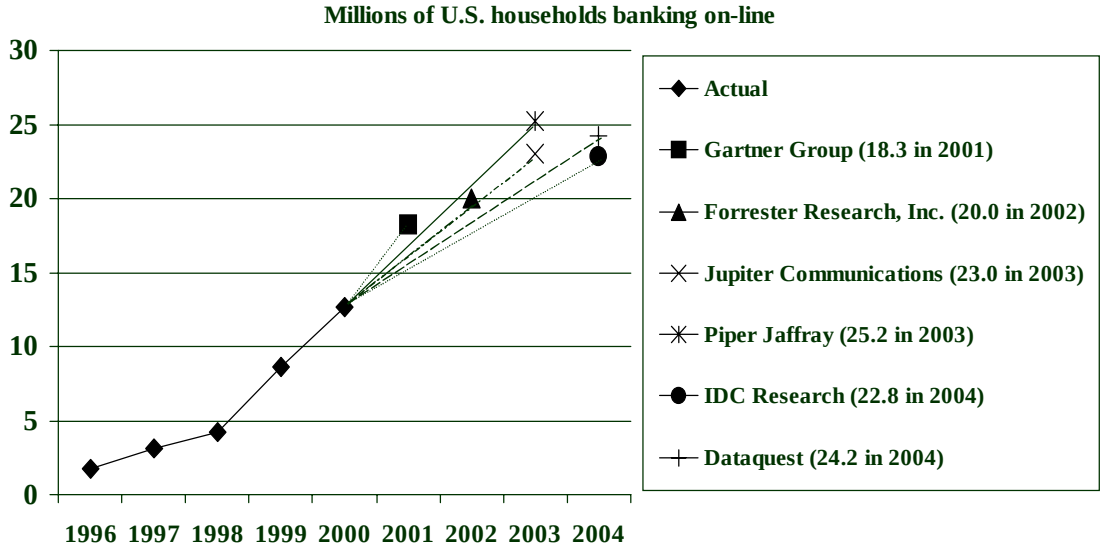
Source: Office of the Comptroller of the Currency

Figure 7.
Internet banking "haves" and "have nots"?



Source: Office of the Comptroller of the Currency

Figure 8.
Projections: growth of "demand" for Internet banking



Source: Office of the Comptroller of the Currency using data from various industry sources