Economic Review

Federal Reserve Bank of San Francisco

1993 Number 2

Determinants of Bank Versus Nonbank Competitiveness in Short-term Business Lending

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Since about 1974, banks' share of the market for short-term business lending has been steadily eroded through competition with nonbank creditors. This paper tries to identify some factors that may affect bank competitiveness in this category in the short run and discusses how these factors may have contributed to banks' loss of market share. Estimation of a simple linear model in first differences indicates that banks' market share responds negatively in the short run to above-average default risk and/or monetary tightness and to a decrease in banks' value of deposit insurance. Banks' market share responds positively to an increase in the level of interbank competition. Extrapolation from the short-run model to long-run effects demonstrates the plausibility that above average risk and/or monetary tightness and increases in the aggregate weighted capital-to-assets ratio, which contributes to decreases in the value of deposit insurance, may have played a small role in banks' loss of market share since the mid-1970s.

Since about 1974, banks' share of the market for short-term business lending has been steadily eroded through competition with a variety of alternative creditors, including finance companies and the commercial paper market. This paper tries to identify some factors that may affect bank competitiveness in this market, at least in the short run, with competitiveness being measured by banks' market share of short-term business credit outstanding.

A reduced form model of bank market share is presented. In this model, market share over time depends on four factors that theoretically could affect the relative supply and demand for short-term bank business loans over time, specifically: (1) changes in the overall level of risk in the economy, (2) financial innovation, (3) bank regulatory costs and benefits, and (4) the level of interbank competition. On the basis of this model, a time series is estimated using linear regression techniques.

Because the data fail stationarity and cointegration tests, the model is estimated in first differences and only short-run influences are identified. I find some evidence that bank market share in short-term business lending responds negatively in the short run to an increase in banks' aggregate weighted capital-to-assets ratio (taken as a proxy for the value of deposit insurance) and positively to an increase in the percentage of total bank assets that is held by bank holding companies headquartered in states with interstate banking (taken as a proxy for the level of interbank competition). In addition, banks' market share appears to fall whenever the deviation is positive between the commercial paper—Treasury bill spread and that spread's mean (taken as a proxy for either the level of economy-wide default risk or the stance of monetary policy).

On the basis of the regression results, the paper then discusses the possible roles played by the various independent variables in explaining the decline in bank market share. However, because the lack of cointegration in the model means that the explanatory variables cannot fully account for the long-run influences on bank market share, the conclusions offered are treated as tentative.

The paper is organized as follows: Section I contains some background on banks' competitors in short-term business lending. Section II discusses the factors that in theory could affect bank competitiveness in short-term business lending. Section III presents a reduced form model of bank market share, defines variables, and discusses data and econometric issues. Section IV contains

regression results. Section V discusses the possible roles of the various independent variables in explaining the decline in bank competitiveness, and Section VI concludes.

I. BANKS' COMPETITORS IN SHORT-TERM BUSINESS FINANCE

In this study, bank competitiveness in short-term business lending is measured by bank market share in this category, based on data from the Board of Governors' Flow of Funds Accounts. As of the third quarter of 1992, bank loans accounted for 52.6 percent of short-term credit to nonfinancial business, "other intermediated credit" for 39.3 percent, and commercial paper for 8.1 percent.[1]

The Flow of Funds Accounts include several sources of what is here called "other intermediated credit," and in the following discussion, I will focus on the two largest, namely, finance companies and offshore lenders.[2] Finance companies, like commercial banks, are financial intermediaries. They raise funds in the commercial paper market, often selling their paper to money market mutual funds, and they lend to both businesses and individuals. Because they do not take insured deposits, finance companies are not subject to regulations, such as reserve requirements and capital requirements, that apply to banks.

In this study, offshore credit may originate from foreign banks or other entities that are located outside the United States.[3] Domestic subsidiaries of foreign banks, as well as U.S. agencies and branches of foreign banks, are excluded from the definition of offshore lenders. Offshore lenders are for the most part not subject to the same regulations that face domestic banks.

The third source of short-term business credit, commercial paper, consists of unsecured short-term promissory notes that are offered to investors either through dealers or directly by the issuer. Original maturities of commercial paper range from one to 270 days, but average less than 60 days. The commercial paper market is a direct debt market, meaning that commercial paper credit is not intermediated. Most commercial paper is backed by bank lines of credit and is therefore issued by those able to obtain such lines of credit, that is, the most creditworthy borrowers.[4] Some commercial paper is sold indirectly through dealers.[5] Thus, the commercial paper market is regulated indirectly by the SEC, which has the authority to issue rules, such as capital requirements, that govern all securities dealers. The SEC also has regulatory authority over some commercial paper investors, such as money market mutual funds. However, any such regulations appear to have been relatively inconsequential to the commercial paper market during the period under study; they receive little or no attention in discussions of the commercial paper market and in studies of competition between banks and the commercial paper market.[6]

II. DETERMINANTS OF BANK COMPETITIVENESS

In this section, I discuss variables which, in theory, could affect bank competitiveness in short-term business lending. These variables represent aspects of the ultimate determinants of bank competitiveness in short-term business lending: the supply and demand for short-term bank loans relative to the supply and demand for alternative short-term business financing. The variables relate to the level of risk in the economy, the relative benefits to banks versus other types of creditors of financial innovation, bank regulatory costs and benefits, and the level of interbank competition.[7]

Economists have several theories about the comparative advantage banks have in serving higher-risk customers. For

1. Trade credit also is a potentially important source of short-term business credit, but it is omitted from the total in this study. In addition, here short-term credit generally has a maturity that is less than one year.

2. Using the Flow of Funds breakdown of "other loans" (called here "other intermediated credit") for the nonfinancial corporate sector and applying it to the entire nonfinancial business sector, I estimate, that, as of year-end 1989, for example, finance company loans accounted for 54 percent of other intermediated credit to nonfinancial business. Other sources and their shares were: offshore (14.5), U.S. government (13.4), bankers' acceptances (7.4), savings and loans (6.7), and government-sponsored agencies (4).

3. A small proportion of this credit is from offshore bookings of U.S.-chartered banks.

4. According to Moody's, about 84 percent of the total commercial paper issues worldwide are issued by companies with A-1 ratings from Standard and Poor's and P-1 from Moody's. See Fuerbringer (1991).

5. Dealers take only about 5-10 percent of the commercial paper they buy into their own inventories. They purchase the remainder for other investors and typically charge a commission of about 1/10 to 1/8 percent on an annual basis (Cook and Rowe 1986, p.116.)

6. See, for example, Estrella (1987), Hurley (1977), Judd (1979), and Cook and Rowe (1986). Hurley does mention that dealers who take relatively high-risk paper (i.e., when the issuer is unrated by two rating services) into inventory have to hold more capital. This rule went into effect in mid-1977, but would have been of very little consequence to the commercial paper market as a whole, because the vast majority of commercial paper is rated.

7. The list of explanatory variables used here is far from exhaustive. For example, I have not considered variables that may affect a bank's choice between making short-term business loans and making other types of investments. However, the ratio of bank short-term business credit to total bank loans and leases has changed relatively little between 1972

example, Diamond (1984) pointed out that information-gathering and evaluation of borrowers and their projects is more efficiently conducted once by a single intermediary, such as a bank, than repeatedly by numerous individual lenders. In addition, long-term relationships with borrowers can be a unique source of information. Such relationships, by their nature, can only be maintained between a borrower and at most a handful of lenders. This comparative advantage in information-gathering and analysis presumably enables intermediaries to make higher-risk loans than those that are made in the direct debt market, because information may lower the effective risk to the lender. This intuition is consistent with the observation that issuers of commercial paper tend to be quite low-risk borrowers.

When intermediaries' information-gathering includes monitoring borrowers' adherence to loan commitments, their relative ability to serve higher-risk customers may be even further enhanced. In this view, monitoring is an additional form of information gathering. Diamond (1991) shows that intermediaries who monitor are especially valuable to borrowers with credit ratings toward the middle of the spectrum. In the presence of moral hazard (the incentive that a borrower has to default on a loan because his *own* money is not at risk), borrowers need to offer potential lenders some assurance that they will not renege. The highest-rated borrowers can credibly "stake their reputation" on their promise to honor their obligations—their good reputation is what allows them to raise capital at a lower rate, and it must be maintained to retain this source of higher profits. These high-rated borrowers do not need to be monitored, and they access debt markets directly. In contrast, very low-rated borrowers have little to lose if they reveal bad news about themselves by defaulting, or by being caught when monitored. Medium-risk borrowers are the ones who need to be able to offer future direct lenders a good "track record" of having been monitored and not found wanting.

Among intermediaries, banks are thought to have special loan-monitoring capabilities, which may stem from banks' special access to information, including information regarding transactions activity, gained from deposit relationships with borrowers (Black 1975). In addition, even if banks do not lend to their own depositors, their general deposit relationships are likely to yield information about the state of local and regional economies that might be useful in monitoring. For example, a banker may assess a local customer's ability to meet loan commitments differently depending on whether or not that customer's industry is experiencing a downturn in the area. Banks may be able to glean advance knowledge of such a downturn from, for example, changes in the inflow and outflow of transactions deposits.[8]

The fact that banks monitor and may thereby have a comparative advantage in making risky loans indicates that the general level of risk in the economy may influence the relative demand for bank credit. However, the direction of influence can be positive or negative. For example, Diamond's model suggests that, as the general level of risk increases, more borrowers in the lowest-risk category may opt for bank credit, but, at the same time, the bank may lose more borrowers to the highest-risk category than it gained from the lowest-risk category.

The next factor to be considered is financial innovation. Here, it is suggested that the financial innovations that began in the 1970s may have put banks at a disadvantage relative to other lenders and therefore may have affected bank competitiveness in the period under study.

Any disadvantage stemming from financial innovation would have resulted largely from regulations that banks face but other lenders do not. In particular, the development and subsequent growth of money market mutual funds, beginning in the early 1970s, caused an outflow of savings from banks. This is because bank time and savings accounts had legally mandated ceilings on interest rates, and money market mutual funds offered a way to circumvent these restrictions. Thus, money market mutual fund growth accelerated significantly in 1973 and 1974, when market rates increased to new highs, and also in later periods of high rates.

Whether savings outflows into money market mutual funds actually decrease banks' short-term business lending is somewhat debatable. One reason to suspect that they may not is that such outflows affect only a subset of funding sources. Banks can obtain funding from sources other than retail deposits (including money market mutual funds themselves, which may purchase bank certificates of deposit) and may therefore substitute purchased funds for

(the earliest year for which such data are easily available) and 1990, ranging from around 30 to 34 percent. In addition, although increases in off-balance-sheet activities may have contributed to a decline in all types of loans, Baer and Pavel (1988) attribute the growth of off-balance-sheet activities partially to increases in banks' capital requirements, and this is controlled for in the model presented here. I also have not attempted to measure banks' cost of complying with numerous and varied consumer regulations.

8. See Fama (1985) for a model in which banks have special monitoring capabilities and in which bank borrowing is useful to borrowers because it generates information which is useful to the borrower's other potential lenders. James (1987) also has found empirical evidence that the information generated by bank loans is useful to borrowers as a signal of creditworthiness.

retail deposits. In addition, banks can shift asset portfolios, and therefore there is no a priori reason to believe that a reduction in funding affects short-term business credit in particular. However, despite the fungible nature of bank liabilities and assets, the development of money market funds may indeed curtail bank competitiveness in short-term business lending. In addition, other financial innovations, such as advances in corporate cash management techniques and greater use of security repurchase agreements, which both reduce the demand for demand deposits, also may affect banks' short-term business lending.

Moreover, the growth of money market mutual funds in particular may affect bank competitiveness not only by way of savings outflows, but also by way of a beneficial synergistic effect on the competitiveness of finance companies and the commercial paper market. This is because the largest single category of money market mutual fund investments is commercial paper, and finance companies raise most of their funds through the commercial paper market, selling mainly to money market mutual funds.[9]

The next few variables to be considered as influences on bank competitiveness also derive their potential importance from the unique regulation of banks. First, banks face reserve requirements—that is, they must hold non-interest bearing deposits at the central bank—while their competitors do not. Reserve requirements therefore impose a cost on banks relative to their competitors, who may optimally invest all their funds. However, as with savings outflows, whether a general increase in required reserves affects banks' business lending in particular might be questioned. The implicit tax on banks might be passed on mainly to banks' borrowers (but even then perhaps mostly to non-business customers) in the form of higher interest rates on loans, thereby decreasing the equilibrium supply of loans, but it might be passed on mainly to depositors in the form of lower interest rates on deposits, thereby having little effect on bank credit.[10] In Section IV, I will investigate empirically whether reserve requirements really do affect banks' share of business credit.

Second, banks have access to deposit insurance, while their competitors do not. Deposit insurance benefits banks because it allows them to raise funds at risk-free interest rates, no matter how risky their loans. As Merton (1977) has shown, banks hold a put option in the form of deposit insurance that, all other things equal, increases the profitability of high-risk loans by allowing banks to reap a high payoff if they "win," while letting the insurer pay off depositors if they "lose." However, banks do pay premiums for deposit insurance. Various authors have attempted to determine whether, in practice, the net value of deposit insurance to banks is positive or negative, with inconclusive results. For example, Pennacchi (1987) concluded that the answer depends on the degree of the insurance authority's regulatory control over banks. However, whether deposit insurance has, on net, a positive or negative value, we can say that an *increase* in the value should increase banks' returns, enhance their ability to attract funds, and thereby increase their relative supply of credit. Likewise, a decrease in the value of deposit insurance would be expected to decrease banks' relative supply of credit.

Third, over much of the period under study, Regulation Q ceilings on bank interest rates were in effect, and these may have played a role in bank competitiveness, complementary to but separate from their role as spurs to innovation. As mentioned above, an important feature of the economy in the early to mid-1970s was the increase in short-term interest rates in the face of ceilings on consumer deposit rates at commercial banks. Even if increases in spreads between market rates and deposit ceilings had not encouraged the *development* of money market mutual funds, they still likely would have increased disintermediation, that is, the flow of funds out of banks and into whatever higher yielding market assets existed at the time.

Fourth, market structure in the banking industry has likely changed due to the liberalization of interstate banking. Laderman and Pozdena (1991) found that the liberalization of interstate banking laws tends to increase the competitiveness of banking markets, as new opportunities open up for competitors to enter from out-of-state. Consequently, because output and total revenue are greater under perfect competition than under monopoly, interstate banking may increase banks' total dollar value of assets. Therefore, assuming no change in the level of competition within other sectors of the short-term business credit market, it is reasonable to suppose that the liberalization of interstate banking may increase bank competitiveness in short-term business lending.[11]

9. As of 1990, 48.4 percent of money market mutual fund assets consisted of commercial paper (Post 1992).

10. See Black (1975) for a model in which the interest foregone on reserves is passed on in the form of lower interest for depositors. See Fama (1985) for a model in which the reserve tax on certificates of deposit is borne by bank borrowers.

11. Because I am viewing banks as competing with other intermediaries and the direct debt market, I do not actually think of any bank as having as much market power as a monopolist would have. Even if it is the only bank in the area, any bank would have competitors in the form of other types of lenders. Despite this, it still is reasonable to examine the effect of bank market structure on aggregate bank credit, because banks remain the major providers in several areas, including payments system services, demand deposits, and short-term business credit itself.

III. MODEL OF BANKS' SHARE OF SHORT-TERM BUSINESS CREDIT

In this section, I present a model of bank competitiveness in short-term business lending. This model is a function of the factors that were discussed in Section II, and it uses the following empirical measures for these factors.

RISK = 6-month commercial paper interest rate − 6-month Treasury bill interest rate − mean of this difference over the period 1960–1990;

TBHIGH = highest 6-month Treasury bill interest rate to date;

RESREQ = (aggregate required reserves/total bank assets) × 6-month Treasury bill interest rate;

KARATIO = total bank capital/total bank assets;

PREM = net aggregate deposit insurance assessments/total insured deposits;

SPREAD = difference between 3-month Treasury bill interest rate and ceiling on interest rate on savings deposits, if this difference is positive, zero otherwise;

and

INTERST = percentage of total bank assets held by bank holding companies that are headquartered in states that permit interstate banking.

RISK measures the level of risk in the economy. Since the commercial paper interest rate reflects a default risk, while the interest rate on Treasury bills is essentially risk-free, the spread between the two rates may be an indicator of overall risk in the economy (Friedman and Kuttner 1991).[12] I use the deviation of the paper-bill spread from its mean to measure the level of risk relative to a "normal" level of risk for the period. It should be noted that the paper-bill spread also can be interpreted as a measure of the tightness of monetary policy, with a higher spread indicating greater tightness. It is expected that monetary policy tightening would differentially affect bank lending, lowering banks' share of short-term business credit.[13]

It may also be noted that, as a measure of default risk, the effect of an increase in this variable on bank market share is expected to be either positive or negative, as explained in Section II. On the other hand, as a measure of the tightness of monetary policy, its effect is expected to be unambiguously negative.

TBHIGH measures financial innovations. Rather than attempt to measure particular financial innovations directly, I use a variable that other researchers have used as an indicator of the *incentive* for financial innovations, because it should serve well as a general measure of all such innovations, not just particular innovations. For example, financial innovations like money market mutual funds, security repurchase agreements, and cash management methods become more attractive as interest rates rise. For consumers, the spread between market interest rates and ceilings on bank rates rises with market rates, creating a market for money market mutual funds. For businesses, the spread between market rates and bank deposit rates is positive and also tends to rise with market interest rates, creating a market for ways to economize on transactions balances, such as repurchase agreements and cash management.

So, increases in market interest rates may increase the profitability of investing in financial innovations. However, if there is a fixed cost to such innovation (for example, the cost of training staff to manage repurchase agreements or the writing of mutual fund management software), it will not be undertaken unless the present discounted value of the interest gained thereby is at least as high as the fixed cost.

Previous authors, for example, Enzler, Johnson, and Paulus (1976), have suggested using the previous highest interest rate as a measure of the perceived net profitability of financial innovation. The idea here is that only if interest rates rise to unprecedented levels will firms perceive that the high rates will persist long enough to make the benefits of innovation outweigh the costs. In addition, subsequent

12. As Friedman and Kuttner point out, even if the actual incidence of default by commercial paper issuers is relatively rare, the paper-bill spread still may be a satisfactory gauge of the perceived level of overall default risk. One reason simply may be that subjective probabilities of default, even if rational, may not equal the frequency rate of default observed within any finite time period. Another possibility is that subjective probabilities are not in fact rational. Because it is subjective default probabilities that matter in the context of the explanation given above for the potential importance of risk, the paper-bill spread would seem to be satisfactory.

13. Friedman and Kuttner (1991), in contrast, argue that changes in bank loans relative to total credit resulting from a tightening of monetary policy cause changes in the paper-bill spread. In the model presented here, monetary policy would simultaneously raise the paper-bill spread (as well as other interest rate spreads, such as the bank loan-bill spread and the certificate of deposit-bill spread) and lower banks' relative supply of business credit.

reductions in interest rates will not reverse the process, because the innovations already will be in place.[14]

RESREQ measures the cost of reserve requirements. Aggregate required reserves is multiplied by a nominal interest rate, the 6-month Treasury bill rate, because required reserves pay no interest. This means that the opportunity cost that banks face as a result of having to hold such reserves rises with the return that would be earned were such reserves not required. The reserve requirement variable has total bank assets in the denominator as a scaling factor.

KARATIO and PREM measure changes in the value of deposit insurance. Deposit insurance can be thought of as a put option, and, as shown by Merton (1977), its value to the bank depends negatively on the bank's capital-to-assets ratio. I measure this ratio with the aggregate book value of capital divided by the aggregate book value of assets, which equals the weighted average of individual bank capital-to-assets ratios, where the weight is the ratio of that bank's assets to total bank assets.[15] PREM, which controls for banks' cost of deposit insurance, measures premium assessments, net of credits, per dollar of insured deposits. (Up until the early 1980s, the Federal Deposit Insurance Corporation refunded to banks a portion of assessment income at the end of each year.)

SPREAD measures the level of disintermediation. The 3-month Treasury bill rate is used rather than the 6-month rate because the 3-month bill is the more liquid of the two instruments. The same reasoning applies to the use of the ceiling on savings deposit interest rates rather than the ceiling on rates on bank certificates of deposit.[16]

INTERST measures interstate banking.[17] As a measure of interbank competition, the interstate banking variable is preferable to other variables such as concentration ratios because it is more of an underlying driving force. For example, the concentration ratio in a local or regional banking market may fall *in response to* the passage of liberalized interstate banking laws. One could say that it is the change in concentration that affects competition, but the real driving force is the change in laws. In addition, the measure used here allows for competition to be affected by the mere threat of entry, whereas concentration measures do not.[18] Finally, interstate banking was found to be correlated with higher levels of interbank competition (Laderman and Pozdena 1991).

The Model

Let nominal short-term business loans from banks, L_b, and other nominal short-term business credit, L_o, be exponential functions such that

$$(1a) \qquad L_b = \exp(c_b + \gamma_b t + \beta_b' X + \epsilon_b)$$

and

$$(1b) \qquad L_o = \exp(c_o + \gamma_o t + \beta_o' X + \epsilon_o),$$

where c_b and c_o are constants, γ_b and γ_o are coefficients, t is a time trend, β_b and β_o are vectors of coefficients, X is a vector of the seven explanatory variables, and ϵ_b and ϵ_o are error terms.

Because the dependent variable is banks' *share* of short-term business credit, it has a value that is restricted to be between zero and one. The error term in the ordinary least squares linear regression model takes on values between negative infinity and infinity, so it is necessary to transform the dependent variable so that it has the same range. A customary transformation, the logistic transform, maps (0, 1) symmetrically into $(-\infty, \infty)$. The logistic transform of the share, s, is S, where

14. Enzler, Johnson, and Paulus (1976) use previous peak interest rates rather than peak interest rates to date, presumably because they see this variable as working with a lag. I include in my regression eight lags on the highest interest rate to date.

15. The capital-to-assets ratio may also affect bank competitiveness through its effect on banks' tax burden. Because debt is generally favored in the tax structure, an increase in the capital-to-assets ratio tends to increase taxes, and thereby, all other things equal, impair bank competitiveness relative to other creditors. It is also possible that an increase in regulatory capital minimums is at least partially an indicator of an increase in omitted factors that have reduced bank profitability and competitiveness. In other words, regulators may have increased required capital-to-assets ratios *in response to* deteriorating bank health. However, this explanation of the effect of capital ratios is more plausible for the late 1980s than for the period under study as a whole.

16. I use the savings deposit interest rate ceiling even after December 1982, when money market deposit accounts (MMDAs) were introduced at banks. Even though MMDAs were not in general subject to a ceiling on interest rates, ceilings did apply until January 1986 for accounts that maintained an average balance of less than $2,500. However, see Furlong (1983) for an account of the instant popularity of MMDAs, despite this restriction.

17. These data are from the Compustat bank file, which contains headquarters location and asset data for a sample of about 150 leading U.S. bank holding companies, representing about 80 percent of U.S. bank assets.

18. It is possible that the interstate banking variable is endogenous; states with weak banks may pass interstate banking laws with the hopes of increasing the market values of their banks as potential acquisition targets. However, this may not be a significant concern, because on average, the liberalization of interstate banking laws *decreases* bank stock returns (Laderman and Pozdena 1991). Nevertheless, some concern remains that the type of effect described might impart a negative bias to the coefficient on the interstate banking variable.

$$S = \log\left(\frac{s}{1-s}\right).$$

Letting L_T be total short-term business credit, we have, from (1a) and (1b),

$$(2) \quad \log\left(\frac{s}{1-s}\right) = \log\left(\frac{\frac{L_b}{L_T}}{\frac{L_o}{L_T}}\right) = \log\left(\frac{L_b}{L_o}\right)$$
$$= c_b - c_o + (\gamma_b - \gamma_o)t$$
$$+ (\beta_b' - \beta_o')X + \epsilon_b - \epsilon_o.$$

Simplifying,

$$(3) \quad S = c + \gamma t + \beta' X + \epsilon,$$

with the coefficients and the error term in (3) corresponding to the differences between the coefficients and the error terms, respectively, in the underlying equations (1a) and (1b). Thus, the coefficients in (3) show the response of outstanding nominal short-term bank credit relative to the response of nominal other credit to changes in the explanatory variables.

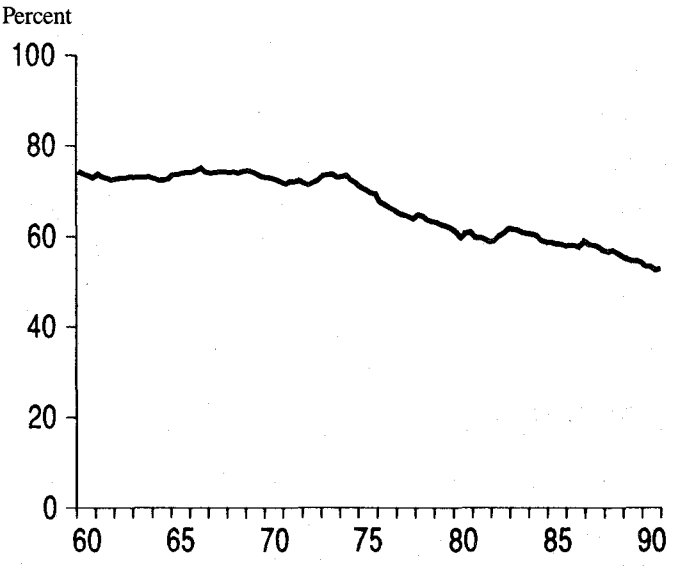
Data

The model is estimated using quarterly data from the Board of Governors' Flow of Funds Accounts for the first quarter of 1960 through the end of 1990.[19] Aggregate required reserves, total assets, and capital are measured in billions of current dollars and were obtained from the Board of Governors' *Annual Statistical Digest*.[20] The 6-month Treasury bill rate, the 3-month Treasury bill rate, the ceiling rate on savings deposits, and the 6-month commercial paper rate all are in percentage terms.

The nontransformed version of banks' share of total U.S. short-term nonfinancial business debt outstanding is shown in Figure 1. The most striking feature is the steady decline in banks' share that begins in about 1974. However, the goals of this paper are, first, to explain only short-run variations in bank competitiveness and then to use these results to explore only informally the possible reasons for the long-run decline. Thus, Figure 1 mainly provides a basis for subsequent discussion of econometric and measurement issues. (For the interested reader, plots of each of the explanatory variables are included in the Appendix.)

FIGURE 1

BANKS' SHARE OF SHORT-TERM BUSINESS LOANS OUTSTANDING



As shown in Table 1, the dependent variable, TSHARE (S in equation (3)), and all but one, or possibly two, of the explanatory variables have unit roots and are thus nonstationary. The variable RISK stands out as the one definitely stationary variable, while the reserve requirement variable may or may not be stationary. However, the treatment of RESREQ as stationary or nonstationary did not affect the results.

19. The numerator of the underlying (nontransformed) share variable is labeled "bank loans not elsewhere classified" in the total credit outstanding to nonfinancial business schedule of the Flow of Funds. The majority of bank loans to nonfinancial business that are "elsewhere classified" are real estate loans. The denominator is bank loans not elsewhere classified plus "other loans" (which excludes real estate loans) plus "commercial paper."

20. The construction of the data series for KARATIO involved splicing together capital and assets measures from two sets of data series—one for domestic offices of domestically chartered banks ("RCON") from 1960.Q1 to 1969.Q1 and the other for domestic *and* foreign offices of domestically chartered banks ("RCFD") from 1969.Q2 to 1990.Q4—because the RCON set changed the definition of capital in 1983, and the RCFD set only began in 1969.

This is a reasonable approach because U.S. banks had very few foreign operations in 1969, and consequently, the changes in the spliced series at the crossover points are very small—only 21 percent of the standard deviation of RCFD assets (calculated over the subsequent three years), and only 14 percent of the standard deviation of RCFD capital, for assets and capital, respectively.

The variables KARATIO and RESREQ use this spliced asset series (based on data from the *Annual Statistical Digest*), while the variable INTERST uses the total assets of banks included in the Compustat sample.

TABLE 1

TESTS FOR UNIT ROOTS
(AUGMENTED DICKEY-FULLER TESTS)

VARIABLE	LEVELS[a]	FIRST DIFFERENCES[b]
TSHARE	−1.99	−3.52***
RISK	−4.04***	N/A
TBHIGH	−2.28	−3.53***
RESREQ	−3.23*	−4.83***
KARATIO	−0.87	−3.91***
PREM	−0.51	−3.57***
SPREAD	−1.95	−3.68***
INTERST	−0.92	−3.83***

*Reject null hypothesis (unit root) at 10% level.
***Reject null hypothesis at 1% level.

[a]With constant and trend, 119 observations. Critical values for 100 observations: −4.04 (1%), −3.45 (5%), −3.15 (10%).
[b]With constant, 118 observations. Critical values for 100 observations: −3.51 (1%), −2.89 (5%), −2.58 (10%).

In the presence of nonstationarity, the normal procedures of statistical inference for ordinary least squares regression are invalid. There are two possible remedies. One is to find a cointegrating relationship between the nonstationary variables in the equation. The other is to estimate the equation in first difference form, transforming each nonstationary variable into the difference between itself and itself lagged one period.

Despite several explanatory variables with strong trends (one indication of the *possibility* of causal relationships between levels of the explanatory variables and the level of the dependent variable), statistical tests showed that the dependent variable is not cointegrated with the set of nonstationary explanatory variables (whether or not RESREQ is included in this set). Also, the dependent variable is not cointegrated with any of the individual nonstationary explanatory variables.[21]

A final data issue pertains to the dependent variable. McCauley and Seth (1992) have argued that the Flow of Funds data significantly underestimate the volume of business credit booked offshore. If this is true, then the dependent variable is an overestimate of bank share as defined, and regression results could be misleading. However, as will be discussed below, results using the McCauley and Seth measures of offshore loans are qualitatively similar to those obtained using the Flow of Funds data.

IV. REGRESSION RESULTS

Results Using Flow of Funds Measure of Offshore Loans

Given the lack of cointegration, equation (3) was estimated using the first differences of the variables TSHARE, TBHIGH, RESREQ, KARATIO, PREM, SPREAD, and INTERST, and the level of the RISK variable. Note that the time trend appears as a constant in the model in first difference form.

It is reasonable to suppose that, if bank market share responds to any of the explanatory variables, it is likely to be only with a lag. Therefore, lags were applied to the explanatory variables, and no contemporaneous terms were included on the right-hand side of the regression. In addition, because the dependent variable could have its own important dynamics, lagged values of the dependent variable were included as explanatory variables. To economize on degrees of freedom and simultaneously pick the lag lengths, the model was estimated using a final prediction error (FPE) procedure, with the possibility of up to eight lags on each explanatory variable. The FPE technique essentially selects the variables and the number of lags on those variables to minimize the model's prediction error.

The regression results are presented in Table 2.[22] Note that the FPE procedure did not select three of the variables at all: TBHIGH, RESREQ, and PREM. (RESREQ was not selected whether it was included in levels or first difference form.) Apparently, changes in these variables, representing financial innovations, reserve requirements, and deposit insurance premiums, respectively, do not aid in predicting changes in banks' share of short-term business lending. As discussed in Section II, it may not be surprising that TBHIGH and RESREQ do not appear to affect banks' share of short-term business credit in particular. In light of uncertainty regarding the incidence of reserve requirement

21. A residual-based test for cointegration was used. TSHARE was regressed on a constant, a time trend, and the levels of all of the explanatory variables except RISK. Then, a unit root test was performed on the residual from this regression, with four lags on the first difference of the residual in the unit root regression. Critical values were obtained from Table IIc in Phillips and Ouliaris (1990).

22. Two common diagnostic tests, a general Lagrange Multiplier (LM) test for autocorrelation of the errors, and an Autoregressive Conditional Heteroskedasticity (ARCH) test for heteroskedasticity of the errors, found that the null hypotheses of no autocorrelation and no heteroskedasticity could not be rejected, lending further credence to the results presented in Table 2.

costs, an alternative measure, a variable based on the reserve requirement ratio for certificates of deposit, was substituted for RESREQ in the FPE regression (following a determination that the new variable was nonstationary).[23] However, the FPE procedure also did not choose this alternative measure.

Two of the included variables, the lagged dependent variable and SPREAD, have negative coefficients at some lags and positive coefficients at others. As indicated by the sums of the coefficients, the net effect after two years of both of these variables appears to be positive. Whether these net effects are statistically significant is debatable. However, *F* tests point toward the lagged dependent variable and the SPREAD being of some importance; *F* tests indicate that the entire group of coefficients on the lagged dependent variable likely is statistically significant and that the group of coefficients on the SPREAD variable likely also is statistically significant.

The importance and direction of influence of RISK, KARATIO, and INTERST are easier to interpret. These three variables have consistent signs on their lags, and the net effects all appear to be statistically significant.

Recall that RISK enters the regression in levels form. Therefore, the results show that when the risk premium is above its mean, the change in banks' market share over the course of the following period is negative, all other variables held constant in levels. Furthermore, an increase in an above-average risk premium strengthens the subsequent period's decrease in market share. On the other hand, an increase in interbank competition appears to increase banks' market share in the next period, as predicted. The capital-to-assets ratio enters with four lags, with a negative coefficient and a fairly high *t* statistic on each of them. Not surprisingly, the *t* statistic for the sum also is high. As predicted then, increases in banks' aggregate capital-to-assets ratio seem to erode bank competitiveness, at least in the short run.

A priori, the sign on the risk variable was ambiguous. An explanation for this was that banks tend to serve customers with a medium absolute amount of risk, so that, as the general level of risk rises, the net inflow into banks' pool of customers may be positive or negative. Apparently, neither result obtains; instead, it appears that as long as the risk premium is simply above its average, banks tend to lose market share in short-term business lending, all other things equal. Again, though, it must be pointed out that the proxy used to measure economy-wide default risk could instead be a proxy for the tightness of monetary policy. It is not unreasonable to suppose that when monetary policy is tighter than average, banks lose market share in short-term business lending.

The apparent statistical significance of the coefficient on the constant term (as indicated by the size of the *t* statistic) also should be noted. With the model in first-difference form, the coefficient on the constant represents the simple effect of the passage of time on the *level* of banks' market share and is in that sense representative of the unexplained portion of the general downward trend in that variable.

TABLE 2

FPE REGRESSION RESULTS

		TRANSFORMED BANK SHARE OF SHORT-TERM CREDIT	
EXPLANATORY VARIABLE	Lag	Coefficient	*t*-ratio
Constant	0	−0.0093	−3.4785
TSHARE	1	−0.0451	−0.4728
	2	0.1802	2.0046
	3	0.0365	0.3964
	4	0.0279	0.3100
	5	0.1977	2.3018
	6	0.1017	1.1306
	7	−0.0147	−0.1715
	8	−0.2821	−3.3478
	Sum	0.2021	1.1055
RISK	1	−0.0159	−2.9771
KARATIO	1	−3.7615	−2.2272
	2	−2.7047	−1.6682
	3	−3.1887	−1.9449
	4	−3.3731	−2.0883
	Sum	−13.0280	−2.8388
SPREAD	1	−0.0052	−1.8652
	2	−0.0069	−2.5331
	3	0.0066	2.1711
	4	−0.0042	−1.3372
	5	0.0067	2.0993
	6	0.0021	0.6615
	7	0.0062	1.9893
	8	−0.0017	−0.5739
	Sum	0.0034	0.4534
INTERST	1	0.0013	2.2679
Adjusted R^2		0.3461	
Total observations		115	

NOTE: All variables except RISK in first difference form.

23. Two versions of the variable were tried. One was the reserve requirement ratio for certificates of deposit with a denomination of at least $100,000 and a maturity of less than 90 days. The second was the same ratio multiplied by the 6-month Treasury bill interest rate. These alternatives to RESREQ were chosen following Fama (1985), which showed that reserve requirement costs for certificates of deposit are passed on to borrowers.

Results Using McCauley and Seth Measure of Offshore Loans

McCauley and Seth (1992) have argued that the Flow of Funds data significantly understate the volume of business credit booked offshore. More specifically, they estimate that from 1984 through 1991, offshore credit to U.S. businesses (mostly corporations) was actually more than double the amount reported by the Flow of Funds, and the discrepancy increased over time. If this is true, then the dependent variable is an overestimate of bank share as defined, at least from 1984 on, and regression results could be misleading.[24] To test the possible importance of this, I substituted McCauley and Seth's measure of offshore loans for the Flow of Funds measure of offshore loans and recalculated the dependent variable for the years 1984 through 1990.[25] The qualitative results were the same as those seen in Table 2.[26]

V. BANKS' LOSS OF COMPETITIVENESS IN SHORT-TERM BUSINESS LENDING

As seen in Figure 1, between 1974 and the end of 1990, banks' share of short-term business credit fell from 73.3 percent to 53 percent. This decline in share took place because, although banks' short-term business credit increased in absolute terms, as shown in Figure 2, the two other categories of short-term business credit increased at a faster rate. As it turns out, other intermediaries' share of short-term business loans outstanding increased 15 percentage points between 1974 and 1990, from 23.3 percent to 38.3 percent, accounting for 73.9 percent of banks' share decrease. So, for the most part, stronger growth in other intermediated credit accounted for banks' loss of market share in short-term nonfinancial business credit. Only 26.1 percent of banks' share loss went to commercial paper.

Given the steady decline in banks' market share, it is natural to try to seek an explanation. For this purpose, I will use the regression results presented in the last section, but the shortcomings of that regression model must be pointed out.

Specifically, because the model is estimated in first difference form, there exists the possibility that, even if it fits quite well, it is a very poor predictor of *long-run* changes in the dependent variable. For example, a *single* non-zero residual in one period in the first-difference equation means that the implied underlying *level* of the dependent variable (calculated using a starting point and accumulating one-period changes) will be off by the value of the residual in *all* subsequent periods. Thus, using the regression results to predict long-run changes in levels from a fixed starting point, as opposed to predicting period-to-period changes, can be misleading, and there is no objective way to judge the extent of the error.

However, even though I have no estimated model of the long-run change in banks' market share, I can use the estimated model of short-run changes to demonstrate informally the plausibility of certain explanations for banks' market share decline. First, in Figure 3, Panel A, I use the estimated model to predict the transformed level of bank share, by using the level at the beginning of the period as a starting point and then sequentially adding the sum to date of the predicted period-to-period changes. Although the predicted levels generally are too low during the period up to 1972, the predicted series does a fairly good job of tracking the *fluctuations* in the actual series. Then, the predicted series misses the brief surge in 1972 that precedes the plunge in 1974, but seems to catch the plunge itself. Then, from 1976 through mid-1978 and from 1983 through 1990, the predicted series tracks the actual series fairly closely in *levels*. Between mid-1978 and 1983, the predicted level is off, but the changes are approximately correct.

The implied levels model includes lagged values of the dependent variable as explanatory variables, and the predicted series depends on these lagged values. The effect of

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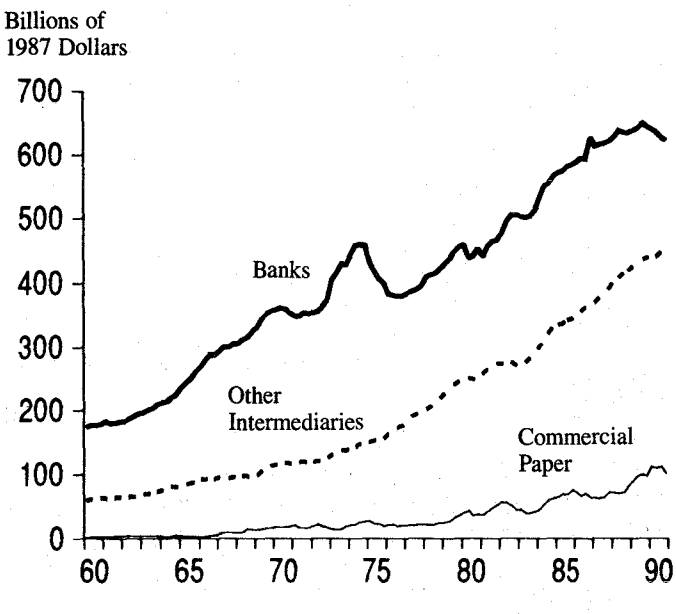
24. McCauley and Seth speculate that U.S. businesses miss large amounts of offshore loans when reporting on the Treasury forms that the Flow of Funds uses, because they do not know that these loans are booked offshore. McCauley and Seth therefore use data reported by foreign banking authorities, which is based on reports filed by lenders, who presumably have more accurate information than borrowers regarding the booking location. On the other hand, the definition of offshore loans used by other central banks may not be strictly comparable with the definition used in this paper; for example, some central banks may report that their banks are lending to U.S.-based firms from non-U.S. sites, when they are actually lending to foreign subsidiaries of U.S.-owned firms.

25. Offshore credit to total nonfinancial business is not broken out separately in the Flow of Funds tables, but offshore credit to nonfinancial corporate business is. Therefore, I assumed that all offshore loans were made to corporations, and I simply subtracted the Flow of Funds measure of offshore credit to corporations from total "other credit" to nonfinancial businesses and then added the McCauley and Seth measure to this category. I also assumed that, prior to 1984, the Flow of Funds measure of offshore loans was roughly correct. The lack of comparable information on offshore credit before 1984 leaves little alternative but to make such an assumption if one wants to incorporate the McCauley and Seth information. In addition, this approach is partially justified by the relative lack of incentives for offshore booking prior to 1984.

26. As before, diagnostic tests for autocorrelation and heteroskedasticity were conducted. The null hypothesis of no autocorrelation could not be rejected. However, the ARCH test for heteroskedasticity indicated that the null hypothesis of no first order autoregressive conditional heteroskedasticity could be rejected at the 9 percent level. While this result is not definitive, it does indicate that some caution should be used in interpreting the t statistics reported in Table 2.

FIGURE 2

SOURCES OF SHORT-TERM NONFINANCIAL BUSINESS CREDIT



lagged values of the dependent variable can be calculated in two ways. One way uses the *actual* lagged values, as shown in Panel A. The alternative, "dynamic forecasting," uses the lags of the *predicted* values of the dependent variable. This more rigorous "test" of the model is shown in Panel B. Judging by appearances, the dynamic forecasting procedure gives a picture that is roughly similar to the one seen in Panel A.

Finally, Panel C presents a third test that is again somewhat more rigorous than the last. Here, the dynamic forecasting procedure is used, but the model is estimated with data from 1960 through 1985 only. The fitted model is then used for out-of-sample prediction of the level over the period 1986 through 1990. Again, the model does fairly well capturing changes in bank market share. The model seems to have the most trouble from mid-1986 through the third quarter of 1987.[27]

All in all, though, the model seems to capture banks' fall-off in market share fairly well. Therefore, it seems reasonable to speculate that the same factors that appear to contribute to negative *first* differences may also have contributed to the long, fairly steady decline seen since 1974. To judge this, the difference between the predicted level at the beginning of the period and the end of the period was calculated, and the contributions of beginning- to end-of-period changes in the various explanatory variables to the predicted decline were estimated.

As it turns out, the only explanatory variables that changed so as to contribute to a decline in the dependent variable were the lagged values of the dependent variable, the time trend, and the risk premium. The simple effect of the passage of time between 1962 and 1990 accounted for 86.1 percent of the total predicted decline, this total being the sum of the effects of only those variables that contributed to a *decline.* (The sum of the negative predicted effects was −1.25, while the net predicted change in the dependent variable, adding in the positive effects of the changes in the capital-to-assets ratio, the savings spread, and the extent of interstate banking, was −0.88. The *actual* change in the dependent variable between the first quarter of 1962 and the fourth quarter of 1990 was −0.86.) The change in the lagged dependent variable accounted for 13 percent, and the risk premium accounted for 0.9 percent. Attributing the effect of the change in the lagged dependent variable proportionally to the time trend and the risk premium, the passage of time accounted for close to 99 percent of the decrease, while the change in the risk premium accounted for about 1 percent of the decline.[28]

However, if we restrict our attention to the period after 1973, a slightly different picture emerges. The capital-to-assets ratio started to increase around 1974. (See Figure A4 in the Appendix.) The increase was at first rather sharp, then reversed itself in the second half of the 1970s, and then resumed around 1980. Given the negative coefficients on the capital-to-assets ratio, the net increase in the capital-to-assets ratio *since 1974* must have contributed to the decline in banks' share since then. However, the part that the change in the capital-to-assets ratio played still was relatively small; the change in the capital-to-assets ratio alone accounted for 7.3 percent of the estimated decline. The other factors in the decline, the passage of time, the lagged dependent variable, and the risk variable, accounted for 68.4 percent, 21.5 percent, and 2.9 percent of the predicted decline, respectively. (In the 1974 to 1990 period, the sum of the negative predicted effects was −0.93, while the net predicted change in the dependent variable, adding in the positive effects of the other variables, was

27. Figure 3 uses the regression results based on the Flow of Funds measure of offshore credit, rather than the McCauley and Seth measure. Comparable results were obtained with the McCauley and Seth data.

28. This assumes that the model is correctly specified in that no explanatory variables have been omitted. Because this is open to question, the actual sizes of the effects of the passage of time and the change in the risk premium likely are somewhat less than this, but still greater than those calculated without attributing any of the effect of the change in the lagged dependent variable to changes in those variables.

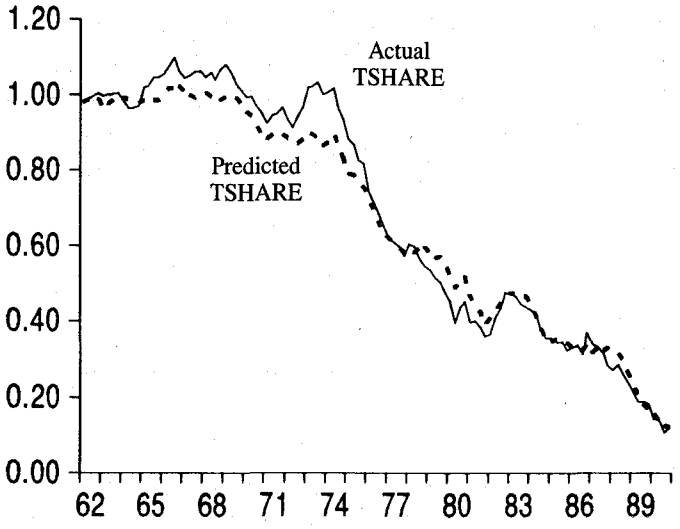
−0.77. The *actual* change in the dependent variable between the first quarter of 1974 and the fourth quarter of 1990 was −0.89.) Again, attributing the effect of the change in the lagged dependent variable proportionally to the other variables, the passage of time, the change in the capital-to-assets ratio, and the change in the risk premium accounted for about 87 percent, 9.3 percent, and 3.7 percent, respectively, of the decline in bank market share.

Given the apparent unimportance of changes in the capital-to-assets ratio and of the risk premium, relative to the importance of the unexplained effect of the time trend, the model presented in this paper does not really "explain" why banks' market share in short-term business lending shrank over the past 30 years. However, *among the factors considered in this study,* it is fair to say that the capital-to-assets ratio and the risk premium are the two variables that are most likely to have played a part in that decline, with the capital-to-assets ratio of slightly more importance than the risk premium.

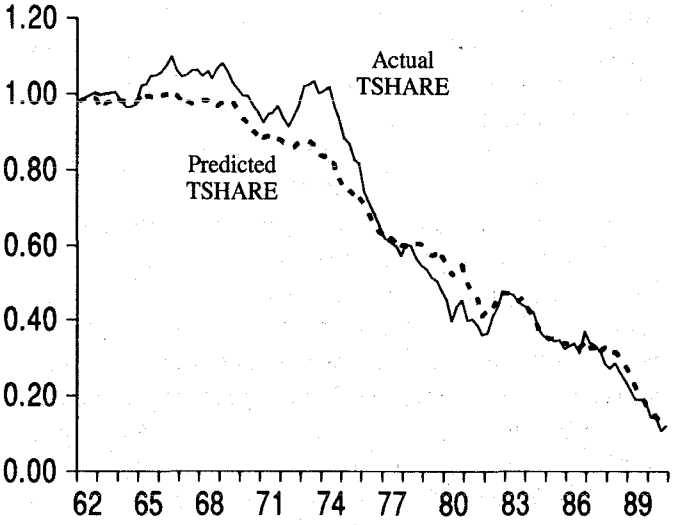
FIGURE 3

Dependent Variable Predictions

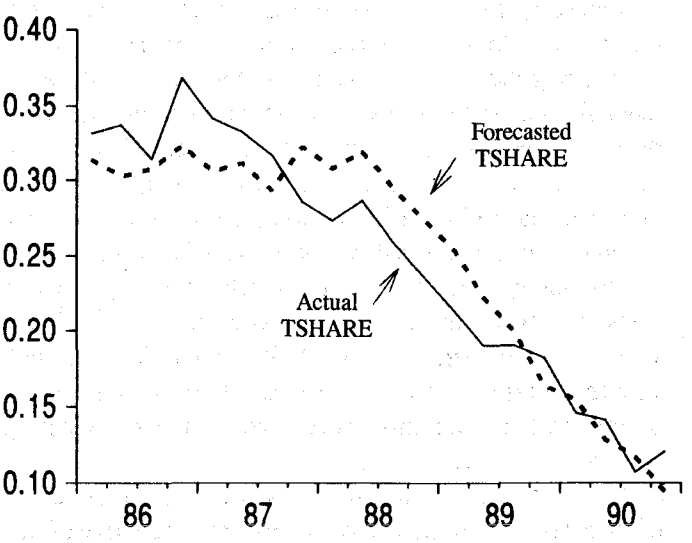
A: Accumulation of Predicted First Differences



B: Accumulation of Predicted First Differences and Dynamic Forecasting Procedure



C: Out-of-sample Forecast of First Differences



Note: In all three panels, TSHARE = log $s/(1-s)$, where s = (short-term bank business loans/total short-term business credit).

Note: Based on 1962.Q2 to 1985.Q4.

As discussed in Section II, an increase in its capital-to-assets ratio decreases the value of a bank's subsidy from deposit insurance and thereby reduces the bank's profitability and competitiveness. Put another way, a bank with a higher capital-to-assets ratio must compensate for the loss in subsidy in some way—for example, by charging higher loan rates, reducing services to borrowers and/or depositors, or paying lower deposit rates—to maintain an adequate return on equity. But this strategy cannot be followed for long without the bank losing market share to creditors offering more favorable terms.

Whether a general increase in the capital-to-assets ratio is in fact an important element of the story of why banks have become less and less competitive in the provision of short-term business credit since the mid-1970s remains very open to question. If, however, increases in the capital-to-assets ratio did have the effect that is being posited here, it is important to point out that this study does *not* then imply that required capital-to-assets ratios for banks should be lowered. *If* banks have been receiving a positive subsidy through deposit insurance, then it very likely is *desirable* to raise capital requirements to eliminate that subsidy and give banks the incentive to control their risk-taking. Unless there are specific welfare or market failure reasons for continuing to subsidize banks, a cutback in subsidization is necessary, despite the possible effect on bank competitiveness. Extreme caution must be used in assessing the net effect of any decrease in capital requirements, given that such a move would likely increase the public's potential deposit insurance liability.

Regarding the risk variable, whether this variable is in fact representative of a risk premium or the stance of monetary policy, it appears that, as long as it is above its mean for the period, banks lose market share in short-term business lending. As it turns out, over the 1962 to 1990 period for which the level of bank market share is simulated (and over the 1974 to 1990 period), the sum of the above-average values of the risk variable exceeds the sum of the below-average values, so the overall effect of the risk variable is to lower bank market share between 1962 and 1990 (and between 1974 and 1990).[29] This is consistent with the interpretation of the risk variable as representative of either a risk premium or the stance of monetary policy. An increase in the risk premium was predicted to have an ambiguous effect on bank market share, while a tightening of monetary policy was predicted to have a negative effect.

29. The mean of the risk variable was taken to be the mean for the entire 1960 through 1990 period. Therefore, had the contemporaneous instead of the lagged value of risk been included in the model, and had the change in bank market share between 1960 and 1990 been the focus, the risk variable would have played no role. This is because the above-average values of risk, by construction, would have exactly offset the below-average values. However, because of the lag structure of the model, the first period for which a level of bank share is simulated is the first quarter of 1962. This means that I examine the role of risk in explaining the change in market share between only 1962 and 1990. Furthermore, the first difference of the dependent variable depends on the first lag of the risk variable. As a consequence of these factors, the risk variable contributes to a 28-year decline in bank market share, largely because the sum of the above-average values of the risk variable, summed over the 28 years over which the simulation is conducted, exceeds the sum of the below-average values.

Separately, it is interesting to note that the large spike in the risk variable occurs at precisely the same time that banks' market share began to plunge. (See Figure A1 in the appendix.)

VI. CONCLUSION

In this paper, I have attempted to identify some of the factors that may affect bank competitiveness in short-term business lending in the short run. The theoretical part of the paper emphasized four general types of variables: the level of risk in the economy, the relative benefits to banks versus other types of creditors of financial innovation, bank regulatory costs and benefits, and the level of interbank competition. After discussing the theoretical effects of these variables on the supply and demand for short-term bank business credit relative to other types of short-term business credit, empirical measures of these variables were introduced and a simple linear model in first differences was presented and estimated.

Estimation of the model yielded several interesting conclusions. First, banks' market share in short-term business lending appears to respond to only some of the theoretical variables that were considered. Among the variables considered, only the risk premium, the aggregate weighted capital-to-assets ratio, the spread between the market interest rate and the deposit interest rate ceiling, and the extent of interstate banking laws seem to matter in the determination of short-run changes in banks' market share. In addition to these, the mere passage of time plays an important but non-illuminating role.

Second, banks' market share appears to fall in the short run when the risk premium is above its long-run mean and when the capital-to-assets ratio rises. On the other hand, market share rises in the short run as the opportunities for interstate banking become more widespread, in accordance with interstate banking being a proxy for the level of interbank competition. The effect of an increase in the interest rate spread is positive at some lags and negative at others, but is positive on net after two years.

Third, the model in first differences was used to explore informally the reasons for the steady decline in bank

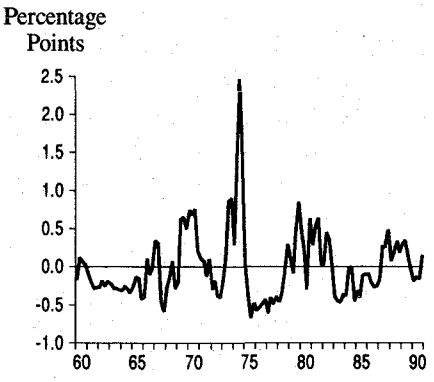
competitiveness in short-term business lending since the mid-1970s. After demonstrating that the estimated model may shed some light on this issue, despite the lack of cointegration, it was concluded that, among the variables considered, only the capital-to-assets ratio and the risk variable could have played any role. Although these variables "explain" only a small proportion of the decline, their effects appear to be consistent with plausible theoretical explanations. First, the increase in the aggregate capital-to-assets ratio since about 1974 may have contributed somewhat to the decline in bank competitiveness by decreasing banks' deposit insurance subsidy. Second, the above-average values of the risk variable since the mid-1970s, representing either an unusually high economy-wide default risk premium or unusual tightness in monetary policy (or both), also may have made a slight contribution.

APPENDIX

The following are plots of the seven explanatory variables:

FIGURE A1

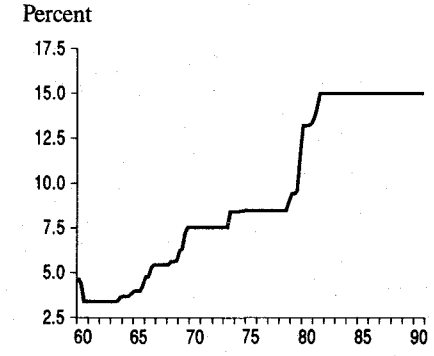
RISK



NOTE: RISK = 6-month commercial paper interest rate–6-month Treasury bill interest rate–mean of this difference over the period 1960-1990

FIGURE A2

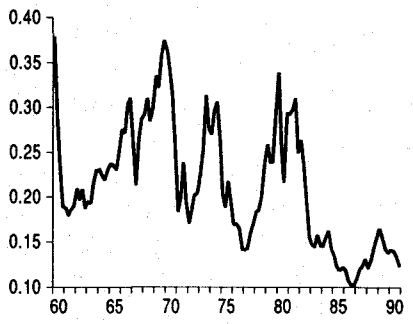
TBHIGH



NOTE: TBHIGH = highest 6-month Treasury bill interest rate to date

FIGURE A3

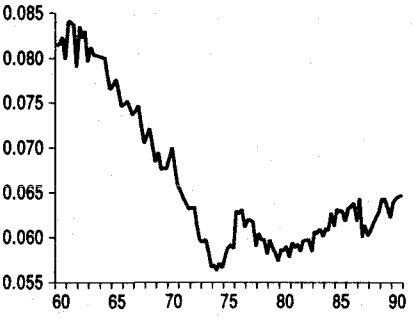
RESREQ



NOTE: RESREQ = (aggregate required reserves/total bank assets) × 6-month Treasury bill interest rate

FIGURE A4

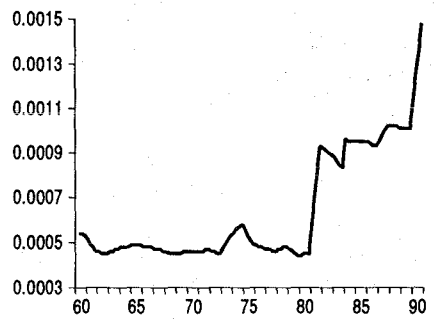
KARATIO



NOTE: KARATIO = total bank capital/total bank assets

FIGURE A5

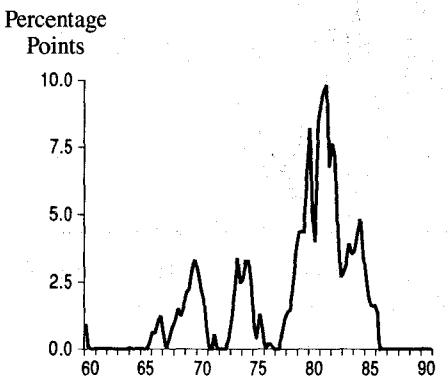
PREM



NOTE: PREM = net aggregate deposit insurance assessments/total insured deposits

FIGURE A6

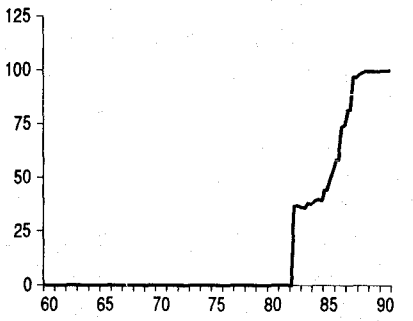
SPREAD



NOTE: SPREAD = difference between 3-month Treasury bill interest rate and ceiling on interest rate on savings deposits, if this difference is positive, zero otherwise

FIGURE A7

INTERST



NOTE: INTERST = percentage of total bank assets held by bank holding companies that are headquartered in states that permit interstate banking

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