

The Value to Banks of Small Business Lending

by

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for



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This study investigates the contribution of relationship lending to the value of banks by estimating the market premium placed on the small business loan portfolios of banks.

This approach contrasts with the previous literature that has focused almost exclusively on the value of lending relationships to the firms that obtain access to bank lending, finding that firms, both large and small, accrue substantial benefits. The underlying hypothesis of this study is that relationship lending is mutually beneficial, benefiting banks as well as the firms to which they lend.

Such a finding would have important implications for bank behavior. For example, to the extent that small business lending increases the market value of banking organizations, consolidation of the banking industry that takes the form of reducing the emphasis on small business lending of acquired banks with a particular expertise in small business lending may be value destroying for the acquirer, and thus not in the best interests of shareholders.

Overall Findings

The authors find that for commercial and industrial loans, small business lending does, in fact, add value to banking organizations overall. This evidence suggests that at least for small banks, the added revenue associated with relationship lending exceeds the added information costs associated with evaluating and monitoring small business commercial and industrial loans. Small business lending was found to be a profitable market niche for small publicly traded banking organizations in the United States.

Highlights

The authors provide direct evidence on the value to banks arising from relationship lending by estimating

the market premium placed on the small business loan portfolios of banks. Among the findings are that:

- Small business loans in the form of commercial and industrial loans with original amounts of \$1 million or less add 10.5 cents to the value of a banking organization for each dollar of such loans held in the bank's portfolio relative to larger commercial and industrial loans.
- This value-enhancing effect emanates from the sample of the smallest banking organizations, those with assets less than \$500 million.
- The value-enhancing effect arises primarily from holdings of the smallest category of commercial and industrial loans, those with original amounts of \$100,000 or less, with the differential effect for the smallest category of banks being over 28 cents per dollar of such small business loans.
- The authors find no evidence that small commercial real estate loans, which tend to be transactional rather than relationship loans, provide a differential effect on bank value beyond that produced by commercial real estate loans more generally. However, commercial real estate loans do produce value for the smallest category of banks.

Scope and Methods

The authors use data from four primary sources: the Federal Reserve's Quarterly Consolidated Financial Statements for Holding Companies, the Federal Reserve's Consolidated Reports of Condition and Income for individual banks (call reports), the Federal Reserve's National Information Center database (NIC), and the Center for Research in Security Prices. The sample consists of the set of publicly traded banking organizations. Annual data for small business loans are obtained from the Small Business Loan Survey section of the June bank call reports.

Because some of the key explanatory variables can be consistently collected only starting from 1994, the empirical analysis is based on annual observations from 1994 through 2005.

The Small Business Loan Survey provides information on loans with original amounts of \$1 million or less in two different loan categories: commercial and industrial loans to U.S. addresses in domestic offices (CI) and commercial real estate loans secured by nonfarm, nonresidential properties in domestic offices (referred to as commercial real estate loans, CRE). The survey also disaggregates these loans into three size categories based on original loan amounts: less than or equal to \$100,000, more than \$100,000 through \$250,000, and more than \$250,000 through \$1 million. Since data on small business loans are available only at the individual bank level and most publicly traded banking organizations are holding companies, the small business loan data were aggregated to the holding company level. For this purpose, all commercial and savings bank subsidiaries of the holding companies are identified using the Federal Reserve's NIC database.

The sample excludes foreign-owned banks, as well as banks located outside the continental United States. Since some of the holding companies are financial services holding companies for which commercial banking activities are not their primary line of business, such organizations are excluded from the sample. Finally, the sample excludes observations with extreme values (outliers), defined as observations with values for the dependent and independent variables that are more than four standard deviations away from the variable's mean value. After applying these filters, the sample is an unbalanced panel that includes a total of 4,333 observations on 817 banking organizations.

In order to test the key hypothesis that relationship lending in the form of small business lending by banking organizations is value enhancing, the authors relate small business lending activity to the market-to-book ratio of the banking organization. They relate bank market value to the book values of assets and liabilities, and to the flows of income produced by off-balance-sheet activities, since the reported notional values are uninformative about the value of such activities.

The authors' empirical specification allows a disaggregation of the total market premium or discount placed on banks into its components by estimating separate valuation coefficients for the individual portfolio categories. The key hypothesis

test is whether the estimated coefficients on bank holdings of small business loans are significantly greater than unity. If so, then small business lending adds to the market value of banking organizations. However, they focus on the differential effect of small business loans relative to that for total loans in that category in order to better control for the average effects of changes in the economic environment on all business loans, with a significant positive estimated coefficient on small business loans indicating that small business loans are value enhancing relative to larger loans.

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Abstract¹

This study provides direct evidence on the value to banks arising from relationship lending by estimating the market premium placed on the small business loan portfolios of banks. Using data from the small business loan survey contained in the June bank call reports, we find that small commercial and industrial loans do, in fact, add value relative to larger commercial and industrial loans for small banking organizations. Interestingly, the value-enhancing effect emanates primarily from the smallest loans, those with original values of \$100,000 or less. On the other hand, small commercial real estate loans, being transactional rather than relationship in nature, do not add additional value to banking organizations relative to larger commercial real estate loans.

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The Value to Banks of Small Business Lending

I. Introduction

This study investigates the contribution of relationship lending to the value of banks by estimating the market premium placed on the small business loan portfolios of banks. This approach contrasts with previous literature that has focused almost exclusively on the value of lending relationships to the firms that obtain access to bank lending.² This literature finds that firms, both large and small, accrue substantial benefits. The underlying hypothesis of this study is that relationship lending is mutually beneficial, benefiting banks as well as the firms to which they lend. Such a finding would have important implications for bank behavior. For example, given the well-known inverse relationship between bank size and the portfolio share of small business loans, the ongoing consolidation in the banking industry will tend to shrink the ratio of small business loans to total loans of the combined banking organization with the consequent increase in bank size. Yet, to the extent that small business lending increases the market value of banking organizations, consolidation of the banking industry that takes the form of reducing the emphasis on small business lending of acquired banks with a particular expertise in small business lending may be value destroying for the acquirer, and thus not in the best interests of shareholders.

Why might small business lending enhance bank value? Relationship lending, unlike transactional lending, provides the bank with the opportunity to exploit the private information it acquires during the course of relationships (see, for example, Sharpe 1990; Rajan 1992; Stein 2002).³ Thus, as a consequence of such relationships, the asymmetric information problem between borrowers and lenders allows banks to develop informational monopolies. By more precisely measuring the credit risk of small, informationally opaque firms through repeated interactions, the relationship bank has an opportunity to earn rents from informationally captured firms by exploiting the proprietary (and superior) information acquired through long-term relationships. It does so by charging an interest rate that is higher than justified by the level of credit risk perceived by an informed lender, yet lower than the interest rate that would be

charged by other potential lenders to the firm due to the higher risk premium required to compensate them for the added risk associated with being less informed about the firm. Thus, the firm does not have an incentive to defect from the relationship and begin a new relationship with another lender. In any case, because it is costly and time consuming to establish new lending relationships, firms are subject to a “lock-in” effect with their current relationship lender.

In addition to income from lending activities, banks may profit from relatively inexpensive core deposits placed with the bank by their relationship borrowers. Additional sources of value for the relationship lender would arise through the opportunities for cross-selling additional products and services to its relationship borrowers. Such value would reflect not only the profitability from current business with the firm, but the profits that might accrue to the bank from future opportunities to continue and expand the menu of products and services provided to the firm as the firm expands, both in terms of size and activities.

Offsetting at least part of these benefits are the costly information collection and processing by banks required for relationship-based finance, since banks serve as the delegated monitors for their depositors (Diamond 1984). In particular, the advantage to the relationship bank would arise from the collection of the more difficult (and costly) to verify “soft” information about smaller, relatively opaque firms, rather than the more widely available, and easier (and less expensive) to evaluate, “hard” (quantifiable) information available to potential lenders about larger, more transparent firms (although non-relationship lenders also can use the limited hard information about smaller firms in their credit scoring models). Given the expense associated with screening and monitoring small, opaque firms, the rents earned by a relationship bank could simply be compensation for its information production and monitoring efforts, and thus not really represent economic rents. However, if the rents earned due to the bank’s informational monopoly power more than compensate the lender for the additional information (screening and monitoring) costs incurred, then relationship loans would add value to a relationship bank. Even so, to the extent that relationship lending to small firms has been profitable in the past, the increased competition among lenders in more recent years associated with bank consolidation and technological advances, including the increased use of credit scoring models by larger and/or more distant banks, may have sharply reduced the profitability of relationship lending. Still, it can be argued (for example, DeYoung et al. 2004) that a focus on

relationship lending by well-managed community banks remains an economically viable strategy.

This study will address the question of the extent to which relationship lending, as measured by the small business loan portfolios of banks, increases the market value of banking organizations. Data from the small business loan survey contained in the June bank call reports is used to assess the relationship between the book and market values of bank small business loan portfolios, as well as of other asset and liability categories. This information is then used to identify the contribution of lending relationships to the market values of banking organizations. We find that for commercial and industrial loans, small business lending does, in fact, add value to banking organizations overall. However, the effect emanates primarily from the smallest banking organizations. Furthermore, the effect comes primarily from the smallest category of small commercial and industrial loans, those with original amounts of \$100,000 or less. On the other hand, small commercial real estate loans, being transactional rather than relationship in nature, do not add additional value to banking organizations beyond that produced by commercial real estate loans generally.

In what follows, Section II provides a brief discussion of relationship lending, emphasizing how and why relationship lending might add value to a banking organization, as well as discussing the meager literature investigating the sources and magnitudes of any such value. Section III discusses the data used in the study. Section IV presents the specification of our empirical tests. Section V presents and discusses the empirical results. Section VI concludes.

II. Background

Previous studies have established that long-term lending relationships between banks and firms are valuable to small firms in terms of increased credit availability and protection against adverse credit shocks (for example, Petersen and Rajan 1994; Berger and Udell 1995; and Cole 1998). And, even for large firms, the announcement of an origination or the renewal of a major bank loan has been shown to be a positive signal to the stock market (for example, James 1987; James and Wier 1990). Similarly, the termination (or increased probability of termination) of

lending relationships adversely affects the market value of a borrower (for example, Slovin, Shushka and Polonchek 1993; Dahiya, Puri and Saunders 2003).

Much of the literature on relationship lending has focused on asymmetric information problems associated with smaller firms that are informationally opaque compared to large firms that are much more transparent. Small firms often have little or no collateral and, in many cases being relatively young firms, lack an extensive history from which future performance can be extrapolated. Because of their small size and the lack of substantial public information about their quality, such firms have virtually no access to external funds from national markets, such as through the issuance of commercial paper, bonds, or publicly traded equity. Thus, small firms tend to be bank dependent for external funds. However, banks are not well informed about the credit risk associated with these informationally opaque firms when they receive an initial loan application. Thus, the formation of bank-firm relationships requires investment by banks in information acquisition and processing, as well as the subsequent monitoring of firm activities. Over time, the payment history of a loan customer accumulates and the firm develops a “private reputation” with its lender.

In contrast, much bank lending is transactional rather than based on private information collected through long-term relationships with firms.⁴ For example, many large banks, and some smaller banks, lend to small firms using credit scoring models, basing their loan decisions on information that can be quantified rather than on private, more qualitative information acquired through direct interaction with the firm.⁵ Rather than making more subjective judgments based on direct interactions with a small firm (“soft” information), credit scoring applies statistical methods to “hard” data, summarizing borrower characteristics to produce a “score” that can be used to evaluate the likelihood of the loan applicant repaying the loan.

Lending to large firms, on the other hand, is quite different, since larger firms are more established, and lenders typically can evaluate more precisely the credit risk of the firm by using public information. Some of this is a consequence of large firms’ access to national debt and equity markets, for example, arising from credit rating agencies, equity analysts, and filings with the Securities and Exchange Commission (SEC). Furthermore, due to the relative transparency of large firms compared to small ones, these large firms typically can borrow from multiple banks under less restrictive loan contract terms. Thus, financial statement lending to large, relatively transparent firms is unlikely to be a source of economic rents to the lender. Similarly,

other transactions-based lending technologies, such as fixed-asset lending, are unlikely to earn the lender substantial rents due to asymmetric information, since the technology for valuing collateral is relatively straightforward. Rather, the benefits accruing to the lender would be related primarily to economies of scale.

Because a bank is unlikely to possess meaningful proprietary information about a large firm, lending to smaller firms has a greater potential for providing rents from superior information and/or superior expertise in originating and monitoring loans. Therefore, a bank can expect to receive greater value from an investment in forming and maintaining a relationship with a small firm than with a large, more transparent firm. On the other hand, the primary source of benefit to a bank from transactional lending would arise from economies of scale, and thus be limited to larger banks. For this reason, one would expect smaller banks to specialize in relationship lending, while larger, more complex banking organizations would tend to specialize in transactional lending. However, the proper distinction is not only bank size, but the organizational structure of the banking organization. For example, Stein (2002) argues that large hierarchies are better at processing hard information, while a decentralized structure is more conducive to using soft information, leaving the large hierarchical firms at a comparative disadvantage at processing soft information (organizational diseconomies). Similarly, Berger and Udell (2002) emphasize the agency problems associated with hierarchal organizational structures, especially for dealing with the soft information upon which relationship lending is based. In general, most of the literature concludes that small banks may have an advantage over large banks in relationship lending (for example, Carter et al. 2004; DeYoung et al. 2004; Berger et al. 2005).

Earlier empirical studies have investigated the effects of informational monopolies arising from bank-firm relationships, but primarily from the perspective of firms. Specifically, these studies investigate the effects of the extent and duration of relationships on the interest rates that relationship borrowers pay on their loans. The close monitoring and interaction that occurs through the provision of various financial products and services allows banks to learn more than outsiders about the financial prospects of their borrowers during the course of relationships, reducing the information asymmetries prevailing in the financial markets and creating value for firms. However, this also can allow banks to earn monopoly rents from informationally captured relationship borrowers, with increasing loan rates being taken as

evidence supporting the presence of informational lock-in problems for the firms. In fact, Sharpe (1990) and Rajan (1992) argue that banks may initially offer below-market rates to firms, relative to their perceived credit risk, and then be compensated by higher interest rates later as the relationship progresses. Furthermore, Petersen and Rajan (1994) find that even though the cost of monitoring decreases as relationships progress, the interest rate charged by a relationship bank does not decline, implying that banks capture some of the value created by relationships. In contrast, Berger and Udell (1995) find that interest rates decline as relationships progress.

The benefits accruing to banks from investing in lending relationships are not limited to the additional interest income they are likely to earn from their private information. Often, bank-firm relationships involve various financial products and services provided by banks. Such cross-selling of financial products and services to relationship borrowers facilitates the information acquisition process of banks and strengthens the implicit long-term commitment to the relationships, in addition to enhancing bank revenues. For example, banks can gather timely data on the cash inflows and outflows, payroll, and other major expenses, as well as the performance of accounts receivables, by monitoring business checking accounts (Nakamura 1993; Mester, Nakamura and Renault 1998). Thus, not only do checking accounts serve as inexpensive sources of funds for banks, they also provide banks with valuable information that is typically unavailable to other lenders. Cross-selling also might involve the provision of services such as financial advising. Consequently, banks gain important insights into the business prospects and risk management practices of the borrowing firms, while, at the same time, earning fee income. Finally, such implicit long-term commitments between firms and banks also are valuable in terms of the potential future business opportunities they provide for banks.

Given the costs to banks associated with collecting and processing information, as well as monitoring borrowers subsequent to originating a loan, it is not clear that any rents extracted from relationship firms will be sufficient to provide relationship lenders excess returns. Among three recent studies, Carter et al. (2004) find that small banks earn greater risk-adjusted returns on commercial and industrial loans than do larger banks, concluding that smaller banks have an advantage in small business lending based on soft information. This suggests that small business lending, at least by the smaller banks, is value enhancing to the banks. On the other hand, the other two recent studies that have investigated the value to banks of relationship lending interpret their empirical results as being pessimistic about relationship lending adding value to banks.

While Bharath et al. (forthcoming) find that past lending relationships increase the probability that a lender will obtain future lending and investment banking business from a firm, they find that the costs to the firm of relationship loans and IPO underwriting fees tend to be lower, not higher, suggesting that relationship banks do not exploit any monopoly power they may have over the firms. Although they do find that fees for debt underwriting are higher for relationship borrowers, it is not clear that the higher fees are associated with rent extraction rather than for services provided through obtaining more favorable terms for the firms' debt issues.

Ergungor (2005), while drawing similarly pessimistic conclusions about whether relationship banks are able to profitably exploit their monopoly position over small, opaque firms, takes a different approach. He uses data on small business loans made by community banks to investigate whether banks that were more actively involved in small business lending outperformed those banks that did less small business lending. For small community banks, he finds that the more active small business lenders earned lower risk-adjusted income and had business loan portfolios that were less profitable, while finding little difference for large community banks. While providing several caveats, he concludes that relationship loans by community banks likely do not add value to the banks.

III. Data

The data for this study come from four separate sources. The primary data sources include the Federal Reserve's Quarterly Consolidated Financial Statements for Holding Companies (Y9-C), the Federal Reserve's Consolidated Reports of Condition and Income for individual banks (call reports), the Federal Reserve's National Information Center database (NIC), and the Center for Research in Security Prices (CRSP).

The sample consists of the set of publicly traded banking organizations.⁶ This list is obtained using CRSP data. Then, using the CRSP data, the daily market price for the common stock of each banking organization and the total number of shares outstanding are used to calculate the average monthly market value of the banking organization. Balance sheet and income data for each bank holding company are obtained from the bank holding company Y9-C reports. Annual data for small business loans are obtained from the small business loan survey section of the June bank call reports (Schedule RC-C Part II). The Small Business Lending Survey is conducted only once per year, beginning in June 1993. Furthermore, some of the key

explanatory variables can be consistently collected only starting from 1994. Therefore, the final sample contains annual observations that begin in 1994 and run through 2005.

The Small Business Lending Survey provides information on loans with original sizes of \$1 million or less in two different loan categories: commercial and industrial loans to U.S. addresses in domestic offices (CI) and commercial real estate loans secured by nonfarm, nonresidential properties in domestic offices (referred to as commercial real estate loans, CRE). This study will focus only on CI and CRE loans to capture the effect of bank-firm relationships on bank value.⁷ For publicly traded banking organizations, the portfolio share of loans to farms is typically very small with, on average, less than 1 percent of total assets devoted to agricultural-related loans. In fact, about one-third of our observations have no small farm loans in their portfolios.

This study investigates the contribution of relationship lending to the value of banks as evidenced by the relationship between the small business loans of banks and the market premium placed on them. Therefore, the population of interest here is limited to the sample of publicly traded U.S. banking organizations, whether a stand-alone bank, a bank holding company (BHC), or, more recently, a financial services holding company, for which market capitalization information is available. Since data on small business loans are available only at the individual bank level and most publicly traded banking organizations are holding companies, the small business loan data must be aggregated to the holding company level. For this purpose, all commercial and savings bank subsidiaries of the holding companies are identified using the Federal Reserve's NIC database.

The sample excludes foreign-owned banks, as well as banks located outside the continental United States. Since some of the holding companies are financial services holding companies whose primary line of business is not commercial banking (e.g., Charles Schwab, J.P. Morgan, Metlife), they are excluded from the sample of banking organizations. Finally, the sample excludes observations with extreme values (outliers), defined as observations with values for the dependent and independent variables that are more than four standard deviations away from the variable's mean value. After applying these filters, the sample is an unbalanced panel that includes a total of 4,333 observations on 817 banking organizations.

IV. Specification

Since relationship-based finance requires costly information collection and processing by banks, the additional interest income and fees earned by a relationship bank could simply be compensation for its information production efforts. However, if the rents earned due to the *ex post* informational monopoly power more than compensate the lender for the additional information costs incurred, then relationship loans would add value to the bank. Whether or not relationship lending is value increasing for banks is then an empirical question.

The key hypothesis to be tested in this study is that relationship lending in the form of small business lending by banking organizations is value enhancing. That is, small business lending activity by banks increases the market value of banking organizations due to the rents they are able to extract from relationship lending to bank-dependent borrowers. In order to test this hypothesis, we must relate small business lending activity to the market value of the banking organization. To do so, one must relate market value to either the book values of assets and liabilities or the flows of income they produce. One benefit of using book values is the ease of interpretation of the estimated coefficients, with the deviation of the estimated coefficient of an asset (liability) component from one (minus one) indicating the value creation or destruction of that activity. However, income measures must be used for off-balance-sheet activities, since the notional values reported in the Y9-C reports by bank holding companies are uninformative about the value of such activities.

The market value of the equity of a banking organization (MVE) is simply equal to the market value of on-balance-sheet assets (MVA), less the market value of on-balance-sheet liabilities (MVL), plus the net market value of off-balance-sheet activities (MVOBS), plus the market's valuation of other characteristics of the banking organization (MVCHAR), such as management quality and efficiency:

$$MVE = MVA - MVL + MVOBS + MVCHAR. \quad (1)$$

Because market values for assets, liabilities and off-balance-sheet activities are not observable, and are not reported by banking organizations, we must replace them with reported measures. For the most part, these are book values which will deviate from market values, depending on the economic environment at the time and the quality of the bank's portfolio. Thus, equation (1) can be rewritten as:

$$MVE = \sum a_i A_i - \sum b_j L_j + MVOBS + MVCHAR + \varepsilon, \quad (2)$$

where the A_i 's represent the various categories of on-balance-sheet bank assets, the L_j 's represent the various categories of on-balance-sheet liabilities, and ε represents measurement or approximation error.⁸ Thus, this empirical framework can be used to infer market values for individual bank asset and liability categories using balance sheet and income data for banking organizations. Furthermore, this specification is consistent with previous studies investigating the valuation of banking organizations, for example, Kane and Unal (1990), Venkatachalam (1996), Barth et al. (1998), Flannery and Houston (1999), and Kohlbeck (2004).

This specification allows a disaggregation of the total market premium or discount placed on banks into its components by estimating separate valuation coefficients for the individual portfolio categories of banks. In this framework, the premium or the discount (in the case of negative premiums) that the market places on the respective asset or liability categories is given by (a_i-1) for assets and $(1-b_j)$ for liabilities. To the extent that the a_i 's and b_j 's differ from unity, the activity associated with the asset or liability category can be thought of as adding value to or subtracting value from the banking organization. Since most of these asset and liability holdings are reported at their book values, we expect some of the estimated coefficients to deviate from (plus or minus) unity, reflecting the extent to which the book values of the on-balance-sheet assets and liabilities deviate from their market values. However, the reported values of certain asset and liability categories will be expected to not deviate from their market value. These would include categories reported at fair value, such as securities holdings and tradable assets and liabilities, as well as very short-term maturity categories, such as federal funds sold or purchased.

Why do market participants discount some on-balance-sheet assets and/or liabilities while valuing others at a premium? There are two main sources of such deviations. First, unanticipated changes in prices, interest rates, exchange rates, economic conditions, or borrower credit risk after the bank assets and liabilities have been originated or purchased cause gains and losses that go unrecognized in book values. Second, the economic value of unbooked intangible assets closely associated with on-balance-sheet financial instruments contributes to the market capitalization of these instruments.⁹ Thus, the values of these intangible assets should be included in the market capitalization of the assets or liabilities with which they are associated, causing their market values to deviate from their book values. Examples would include lending

relationships and demand deposit relationships, as well as the implicit value of deposit insurance guarantees.

In particular, the focus of this study is the value enhancement that arises from lending relationships. For this purpose, the extent of a bank's existing long-term relationships is assumed to be related to the degree to which a bank participates in small business lending. To the extent that informational asymmetries are likely to be more severe for small firms than for large firms, the use of small business loans as an indicator of long-term bank-firm relationships is appropriate.¹⁰ Thus, the importance to banks of relationships for small business lending, compared to their lending to larger firms, is the key identifying assumption used to investigate the value of lending relationships to banks.

Thus, the focus of the study will be on the estimated values of the a_i 's associated with bank holdings of small business loans. The key hypothesis test is whether those estimated coefficients are significantly greater than unity. If so, then small business lending adds to the market value of banking organizations. In that case, one would conclude that lending relationships add to the market value of banking organizations. However, a better comparison is between the a_i 's for total loans in a loan category and the associated a_i for small business loans in that category, with the difference reflecting the additional value created by small business lending relative to lending to larger firms. By focusing on the differential effect, the specification better controls for the average effects of changes in the economic environment (such as business cycles, unexpected changes in interest rates, etc.) on all business loans. Thus, this specification provides a framework for directly investigating the extent to which relationship lending increases bank market values.

Although we include two categories of small business loans, CI and CRE, given the different natures of these two loan categories, the primary focus will be on small CI loans. Small CI loans better fit the category of relationship loans, although many of the larger banks make such loans on a transactional basis using credit scoring models. Thus, we might anticipate that small CI loans would be value-enhancing to small and mid-sized banks, but less so to larger banks. On the other hand, small CRE loans tend to be transactional loans, being a form of asset-based lending with real estate serving as collateral. Thus, we might not expect such lending to be particularly value-enhancing to the lender, insofar as such lending is not based on private

information arising from long-term relationships. However, it is possible that economies of scale might provide economic rents from such loans to the larger banking organizations.

To make equation (2) operational, we still need to specify the dependent variable, the various categories of on-balance-sheet assets and liabilities, off-balance-sheet activities, and the other relevant characteristics of the banking organizations. Furthermore, to account for heteroscedasticity, we divide each variable in the equation, including the constant term and error term, by the book value of equity (BV), measured as total equity capital less perpetual preferred stock and related surplus.

Dependent variable

The dependent variable (MVBV) is the market value of equity of the banking organization divided by its book value. Because all of the banking data are measured as of the end of June, we use the average of the daily market values for July.

On-balance-sheet assets and liabilities

Each of these measures is based on the June (bank or bank holding company) call reports and has been scaled by the book value of equity. The asset categories include four types of loans secured by real estate: commercial (nonfarm, nonresidential) real estate loans (CRE), construction, land development and other land loans (CSTR), one-to-four family residential loans (RES), and multifamily residential loans (MULT). Loans secured by farmland are combined with loans to finance agricultural production and other loans to farmers (FARM). The asset categories also include commercial and industrial loans (CI), credit card loans (CCD), other (non-credit card) consumer loans (CONS), and other loans less unearned income on loans (OTHLNS), with the latter including all remaining loan types, such as loans to depository institutions, foreign loans and loans to foreign governments. In addition to total commercial real estate loans and total commercial and industrial loans, we also include small business commercial real estate loans (SMCRE) and small business commercial and industrial loans (SMCI), with the estimated effects on these two categories reflecting any differential effect of small business loans relative to loans to larger businesses.

In addition to these loan categories, we include total leases (LEAS), other real estate owned (OREO), securities at fair value (SEC), trading assets (TRADA), premises and fixed assets (FIX), intangible assets (INTAN), reserves (RESV), net federal funds sold and securities repurchased under agreements to resell (FF), and all other assets (OTHA). In addition, we

include two measures of problem loans, nonperforming loans and other assets (NPL) and the loan loss reserve (LLR). Liability components include core deposits (CORE), other deposits (OTHDEP), trading liabilities (TRADL), and all other liabilities (OTHLIAB). Finally, to control for the interest sensitivity of on-balance-sheet assets and liabilities, we include GAP, measured as earning assets that mature or are repriceable within one year less interest-bearing liabilities that mature or are repriceable within one year. Because the interest rate environment differs from year to year, the implications of GAP for the value of a banking organization will differ from year to year. Thus, we interact GAP with the set of year dummy variables in order to allow GAP to have a different estimated coefficient each year.

Off-balance-sheet activities

Off-balance-sheet activities are measured using the fee income generated by these activities (FEE). This variable includes total noninterest income less any items not attributable to off-balance-sheet activities, such as service charges on deposit accounts, net gains on sales of loans and leases, and net gains on sales of other real estate owned. It is measured using the June call reports and has been scaled by BV.

Other bank characteristics

These variables are taken from the June call report, but have not been scaled by BV. For consistency of the estimated equation with equation (2), one can think of each variable in the vector MVCHAR as having been multiplied by BV, so that BV cancels out when all variables in the equation are scaled by BV. The set of other bank characteristics include the logarithm of total assets (LASSETS), the ratio of fee income relative to total income (FEE), operating (noninterest) expense relative to total income (OPEXP), the sum of trading assets and trading liabilities divided by total assets (SHTRADAL), and the logarithm of the Herfindahl index (LHERF), computed using the assets of the individual bank subsidiaries of the banking organization to reflect the concentration of the organizational structure of the banking organization.¹¹

Coefficient restrictions

As noted above, a subset of the on-balance-sheet asset and liability categories as reported on the call reports can be treated as approximating market values. Thus, their expected coefficients should be equal to one (for asset components) or minus one (for liability components). Because asset and liability components exhibit substantial correlations with each

other in many instances, we restrict the estimated coefficients of these asset and liability components to one or minus one, respectively. The set of variables so constrained includes RESV, SEC, FF, TRADA and TRADL. We could not reject these restrictions, with none of the estimated coefficients in the unrestricted specification being statistically significantly different from one (minus one for TRADL).

V. Estimation Results

Table 3 contains the means, standard deviations, minimum and maximum values for each of the variables used in the regression equations, with each variable described in the Appendix. Outliers, defined as those observations more than four standard deviations from the mean value for each variable, have been removed. In addition to the set of explanatory variables discussed above, each equation includes a set of annual dummy variables to control for effects emanating from the general macroeconomy, such as interest rates, the business cycle, and changes in stock price indexes. To account for any correlation of residuals for a given firm across years, we use clustered standard errors.

Table 4 contains the estimates for the base regression. Column 1 contains the estimates for all banking organizations in our sample, while columns 2, 3 and 4 contain subsets of banks based on bank asset size classes. In each of the four columns, the point estimates for the loan categories are each very close to unity, with the exception of credit card loans, farm loans, and leases. However, in each instance the largest deviations occur for the subset of banks for which the activity is relatively unimportant: credit cards and leases for the smallest banks, and farm loans for the largest banks.

With respect to the value-enhancing characteristics of small business loans, column 1 indicates that each dollar of small commercial and industrial (C&I) loans held in a bank's portfolio adds 10.5 cents to the market value of the banking organization *relative* to large C&I loans, with the difference being statistically significant. Summing the estimated coefficients on CI and SMCI indicates an *absolute* effect of small C&I loans of over 7 cents per dollar of small C&I loans held in the portfolio. When we consider only the smallest banking organizations in our sample (assets < \$500 million in constant 2005 dollars), shown in column 2, we obtain essentially the same results for the impact of SMCI loans, with the differential effect remaining statistically significant. However, when we consider only the mid-sized banks in our sample

(those with assets between \$500 million and \$1.5 billion), shown in column 3, the differential effect of SMCI is only about half as large and is no longer statistically significant. When we consider only the largest banking organizations (assets > \$1.5 billion), shown in column 4, the size of the estimated coefficient on SMCI is of the same magnitude as those for the entire sample and for the small bank subsample, although the effect is not statistically significant. These results suggest that the value-enhancing differential effect of small C&I loans is coming, in large part, from the smaller banking organizations where relationship lending is most prevalent.

These results are consistent with relationship lending adding value to banks. For small banks, it appears that their expertise in originating and monitoring small C&I loans does add to the market value of the banks relative to their activity associated with larger C&I loans, as these banks exploit the private information about smaller, opaque borrowers accumulated over the course of long-term relationships. Because one would expect relationship lending to be much less prevalent at the largest banks that tend to use credit scoring models (a transactions technology) to originate many of their small C&I loans, it is not surprising that the value-enhancing effects occur predominantly at the smallest banking organizations.

Column 1 indicates that commercial real estate (CRE) loans have a value-enhancing effect of about 4.2 cents for each dollar of CRE loans held in a banking organization's portfolio. However, the statistically insignificant and essentially zero estimated coefficient on SMCRE indicates that small CRE loans have no differential effect over and above that of large CRE loans. For each of the three bank size categories, the estimated coefficient on total CRE loans is greater than unity, although only that for the smallest subset of banks is statistically significantly different from one, while the differential effect of SMCRE is never statistically significant. Thus, small CRE loans do not appear to enhance the value of banking organizations any more than do large CRE loans.

However, the result that small CRE loans do not add value to banks *relative* to large CRE loans should not be particularly surprising, since CRE loans are asset-based loans that are originated using a transactions technology rather than being relationship based so that the superior information that arises from lending relationships is less important than for C&I lending. That is, the primary determinant of the origination decision is the quality of the collateral for the loan, rather than private information about the borrower accumulated through a long-term relationship. On the other hand, CRE loans have a statistically significant value-

enhancing effect (significantly greater than one) only for the smallest subset of banking organizations, where private information about borrowers is most likely to be a factor in the lending decision.

With respect to the other components of the asset side of the balance sheet, the estimated coefficients on other real estate owned (OREO) differ significantly from unity and vary considerably across bank size classes. This may be because current OREO assets may indicate additional (yet to be reflected) problems in a bank's real estate portfolio and also likely are correlated with a bank's nonperforming loans and loan loss reserve, making it difficult to pinpoint the estimated effect. Similarly, fixed assets (FIX) have a surprisingly small estimated effect for the largest set of banks. On the other hand, because of the nature of intangible assets, it is not particularly surprising that the market value of INTAN is substantially less than its book value. With respect to measures of problems in the asset portfolio, the estimated coefficients on nonperforming loans are negative, as expected, while the estimated coefficients on the loan loss reserve are not consistently signed, although none are statistically significant. However, it is not clear just which sign these coefficients should have. One might expect a positive coefficient, insofar as they represent an asset held against nonperforming loans. On the other hand, to the extent that banks systematically underreserve for problem loans, each dollar of LLR would indicate additional amounts of unreserved-for problem loans, suggesting a negative coefficient.

With respect to liabilities, each of the estimated coefficients is negative, as expected. Also as anticipated, core deposits are value-enhancing for banking organizations, with each dollar of core deposits adding 9 cents to the market value of the bank for the full sample, with the estimated coefficient on CORE being statistically significantly different from one. Interestingly, core deposits add more per dollar to the value of larger banks, with the value-enhancing effect being statistically significant for the mid-sized and largest banking organization subsamples. On the other hand, both other deposits and other liabilities have point estimates that suggest that they reduce the market value of the bank, with the estimated coefficients for all banks and the smallest bank class, as well as that for other liabilities for the set of mid-sized banks, being statistically significantly different from one.

Off-balance-sheet activities add value to banks, based on using the fee income that they generate as the proxy for those activities. Unsurprisingly, the effect is substantially larger for larger banks, where off-balance-sheet activities represent a more important component of their

activities, than for the smaller banks, based on a comparison of the estimated coefficients in columns 2, 3 and 4. With respect to the other bank characteristics, larger banks have a higher market-to-book ratio, other things equal. Unsurprisingly, a higher ratio of operating expenses relative to total income reduces market value, with the adverse effect being greater the larger the bank size class. Similarly, a higher proportion of trading assets and liabilities reduces market value, perhaps because such assets and liabilities are viewed as riskier or less transparent and thus are discounted more. Finally, the concentration of bank subsidiaries within a banking organization, as reflected in LHERF, has no effect on the market value of a banking organization.

The market value of banking organizations does show sensitivity to the one-year gap measure, GAP. As expected, the magnitude of the effect varied from year to year as the interest rate environment changed. Early in our sample period, the effect was negative as interest rates rose. Then as interest rates leveled out and began falling, the effect turned positive. Then, after interest rates began to rise at the end of the 1990s, the GAP effect again turned negative, remaining negative for most of the remainder of our sample period even as interest rates declined substantially before beginning to rise again later in the sample period.

Table 5 further investigates the impact of small business lending on the market value of banking organizations by disaggregating small business loans into two size categories in order to isolate the effects of the smallest category of reported loans that likely contain most of the loans originated using credit scoring models at the larger banks. The prefixes on CI and CRE indicate the size class, with SM1 referring to the smallest size class (equal to or less than \$100,000), and SM23 referring to the combination of the other two size classes (above \$100,000 through \$250,000 and above \$250,000 through \$1 million). For the set of all banks (column 1), only one of the individual small business loan categories has a statistically significant impact, the smallest category of C&I loans (SM1CI). In part, the general lack of significance of the small loan effects may reflect the strong correlations among these measures. Strikingly, the value-enhancing effects of small business loans arise from the smallest loan size category, producing an estimated effect that is about one and one-half times that in Table 4 for SMCI for the all banks sample, and nearly three times as large as that in Table 4 for SMCI for the smallest bank size class. However, the table produces no indication that value is added to the mid-sized and largest banks that tend to use credit scoring technology from C&I loans of \$100,000 or less.

VI. Concluding Comments

This study has investigated the extent to which relationship lending enhances the market value of banking organizations. As our proxy for small business loans, we use commercial and industrial loans and commercial real estate loans with an original value of \$1 million or less. We find that small C&I loans add more market value to the smallest banking organizations than do larger C&I loans, although the differential effect is not found for the larger bank size classes. This suggests that at least for small banks, the added revenue associated with relationship lending exceeds the added information costs associated with evaluating and monitoring small business loans. Furthermore, the effect appears to be emanating primarily from the smallest size category of C&I loans, those with original amounts of \$100,000 or less.

In contrast, while small commercial real estate loans add value to banking organizations, small CRE loans do not appear to enhance the market value of banks beyond that from CRE loans generally, even for the smallest set of banks. One explanation for these contrasting results is that CRE loans represent transactional rather than relationship lending; being based on collateral rather than superior private information about relationship borrowers makes the advantages arising from information-intensive relationship lending less important.

Our direct evidence that small business lending is a profitable market niche for small publicly traded banking organizations in the United States suggests that such banks should actively participate in lending to small businesses. The evidence is consistent with these banks having a comparative advantage in originating and monitoring small business loans compared to larger banking organizations. Thus, consolidation of the banking industry, insofar as it takes the form of the acquisition of smaller banking organizations by larger banking organizations that are less focused on small business lending, may be value destroying, and thus not in the interests of the shareholders of the acquiring banking organizations.

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Table 1 Distribution of bank observations by asset size and by year

	Total	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<i>Number of observations</i>													
All banks	4,333	303	328	358	376	377	387	362	356	368	383	376	359
Assets below \$500 million	1,285	88	110	127	127	134	141	127	105	92	87	83	64
\$500 million - \$1.5 billion	1,515	93	94	115	127	121	116	117	134	149	153	149	147
Above \$1.5 billion	1,533	122	124	116	122	122	130	118	117	127	143	144	148
Above \$10 billion	398	34	39	37	33	30	30	26	28	34	38	35	34

Table 2. Small business loans, scaled by total loans in corresponding category

	Asset category (in \$ 2005)			
	Below 500 million	500 million – 1.5 billion	Above 1.5 billion	Above 10 billion
	<i>Entire sample period</i>			
Number of observations	1,285	1,515	1,533	398
Total small CI loans	77.68 (%)	67.52 (%)	50.52 (%)	34.06 (%)
- below \$100,000	29.24	23.95	16.90	11.27
- between \$100,000 and \$250,000	18.86	15.65	11.07	7.08
- between \$250,000 and \$1 million	29.58	27.92	22.55	15.71
Total small CRE loans	67.24	56.73	47.50	42.43
- below \$100,000	8.05	6.94	5.79	4.64
- between \$100,000 and \$250,000	16.26	13.56	11.02	9.65
- between \$250,000 and \$1 million	42.93	36.23	30.69	28.14
	<i>1994-1997</i>			
Number of observations	452	429	484	143
Total small CI loans	75.75	65.02	49.22	32.14
- below \$100,000	30.15	25.39	17.20	9.93
- between \$100,000 and \$250,000	17.83	14.67	10.29	6.84
- between \$250,000 and \$1 million	27.77	24.96	21.73	15.37
Total small CRE loans	68.96	58.60	52.16	45.31
- below \$100,000	9.26	8.78	7.88	5.84
- between \$100,000 and \$250,000	17.36	14.57	12.54	10.58
- between \$250,000 and \$1 million	42.34	35.25	31.74	28.89
	<i>1998-2001</i>			
Number of observations	507	488	487	114
Total small CI loans	78.46	69.67	51.56	33.77
- below \$100,000	30.33	25.11	18.21	11.59
- between \$100,000 and \$250,000	19.08	15.96	11.33	6.94
- between \$250,000 and \$1 million	29.05	28.60	22.02	15.24
Total small CRE loans	67.41	59.88	49.92	43.32
- below \$100,000	8.48	7.65	6.25	5.01
- between \$100,000 and \$250,000	16.71	14.73	11.79	9.60
- between \$250,000 and \$1 million	42.22	37.50	31.88	28.71
	<i>2002-2005</i>			
Number of observations	326	598	562	141
Total small CI loans	79.14	67.55	50.74	36.25
- below \$100,000	26.26	21.97	15.52	12.37
- between \$100,000 and \$250,000	19.95	16.09	11.52	7.44
- between \$250,000 and \$1 million	32.93	29.49	23.70	16.44
Total small CRE loans	64.64	52.82	41.39	38.79
- below \$100,000	5.72	5.04	3.59	3.13
- between \$100,000 and \$250,000	14.04	11.89	9.06	8.74
- between \$250,000 and \$1 million	44.88	35.89	28.74	26.92

Table 3: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
MVBV	4333	1.8630	0.6828	0.2888	5.2712
CI	4333	1.3317	0.9257	0.0000	6.2091
SMCI	4333	0.7905	0.5818	0.0000	3.9514
SM1CI	4333	0.2521	0.2108	0.0000	2.6008
SM2CI	4333	0.1834	0.1488	0.0000	1.2424
SM3CI	4333	0.3550	0.3133	0.0000	2.7715
CRE	4333	1.8969	1.1260	0.0006	7.3946
SMCRE	4333	1.0431	0.6950	0.0000	4.5344
SM1CRE	4333	0.1088	0.1106	0.0000	1.1599
SM2CRE	4333	0.2341	0.1655	0.0000	1.2537
SM3CRE	4333	0.7001	0.5242	0.0000	3.8798
CSTR	4333	0.5557	0.5804	0.0000	3.5817
RES	4333	2.4790	1.5051	0.0087	9.6646
MULT	4333	0.1891	0.2599	0.0000	2.2664
FARM	4333	0.1334	0.2276	0.0000	1.3934
CCD	4333	0.0784	0.1441	0.0000	1.4059
CONS	4333	0.7248	0.6618	0.0000	3.6473
OTHLNS	4333	0.1031	0.1595	-0.4228	1.4296
LEAS	4333	0.0677	0.1584	0.0000	1.1769
OREO	4333	0.0147	0.0286	0.0000	0.3833
SEC	4333	2.9248	1.5241	0.0401	12.0206
TRADA	4333	0.0118	0.0592	0.0000	0.9504
FIX	4333	0.1996	0.1009	0.0040	0.6859
INTAN	4333	0.0938	0.1137	0.0000	0.5975
RESV	4332	0.4923	0.2743	0.0126	4.1537
FF	4333	-0.2225	0.6612	-3.1659	2.8167
OTHA	4333	0.2917	0.1713	0.0243	1.2958
NPL	4333	0.0640	0.0617	0.0000	0.5948
LLR	4333	0.1103	0.0458	0.0086	0.4425
CORE	4333	5.2158	1.7726	0.1475	14.6453
OTHDEP	4333	3.9463	1.5408	0.3103	12.3875
TRADL	4333	0.0034	0.0255	0.0000	0.4918
OTHLIAB	4333	1.0931	1.0226	0.0203	7.0965
FEE	4333	0.0737	0.0694	0.0003	0.5683
LASSETS	4333	14.0003	1.4051	11.5620	19.8908
OPEXP	4333	0.4133	0.0932	0.1192	0.8262
SHTRADAL	4333	0.0012	0.0063	0.0000	0.0870
LHERF	4333	8.9092	0.5397	5.9957	9.2103
GAP	4333	0.8604	2.4161	-9.5450	10.5829

Note: Variables described in Appendix.

Table 4: Determinants of market value of banking organizations: full sample and by bank size

	All banks	Assets below 0.5 billion \$2005	Assets between 0.5 and 1.5 billion \$2005	Assets above 1.5 billion \$2005
	(1)	(2)	(3)	(4)
CI	0.969** (0.030)	0.966** (0.046)	0.988** (0.042)	0.977** (0.045)
SMCI	0.105** (0.039)	0.109* (0.054)	0.050 (0.066)	0.107 (0.083)
CRE	1.042** (0.026)	1.066** ^b (0.030)	1.024** (0.042)	1.051** (0.057)
SMCRE	-0.003 (0.035)	-0.037 (0.045)	0.065 (0.062)	0.021 (0.086)
CSTR	1.131** ^a (0.035)	1.125** ^a (0.050)	1.174** ^a (0.050)	1.102** (0.056)
RES	1.018** (0.017)	1.010** (0.020)	1.011** (0.023)	1.049** (0.031)
MULT	1.010** (0.066)	0.950** (0.077)	0.978** (0.084)	1.090** (0.108)
FARM	1.147** ^b (0.064)	1.004** (0.082)	1.173** ^b (0.080)	1.252** ^b (0.113)
CCD	0.804** (0.116)	1.359** (0.313)	0.821** (0.290)	0.867** (0.104)
CONS	1.049** (0.027)	1.087** ^b (0.037)	1.076** ^b (0.040)	0.993** (0.042)
OTHLNS	1.064** (0.120)	1.308** (0.185)	1.073** (0.166)	1.026** (0.167)
LEAS	1.194** (0.123)	0.663** ^a (0.135)	1.266** ^a (0.107)	1.274** (0.168)
OREO	0.661 ^c (0.379)	-0.217 ^a (0.468)	-0.118 ^a (0.578)	1.616 ^c (0.859)
FIX	0.816** (0.183)	1.169** (0.184)	0.951** (0.217)	0.051 ^b (0.445)
INTAN	0.362** ^a (0.123)	0.268 ^a (0.226)	0.217 ^a (0.203)	0.324** ^a (0.167)
OTHA	1.151** (0.110)	1.064** (0.179)	0.994** (0.166)	1.075** (0.161)
NPL	-1.380** (0.230)	-0.702** (0.243)	-1.614** (0.330)	-2.803** ^c (0.531)
LLR	-0.197 (0.465)	-0.545 (0.525)	0.249 (0.701)	-0.159 (0.688)
CORE	-0.910** ^c (0.013)	-0.969** (0.023)	-0.898** ^c (0.029)	-0.839** ^c (0.022)
OTHDEP	-1.046** ^c (0.017)	-1.068** ^d (0.029)	-1.037** (0.033)	-1.024** (0.029)
OTHLIAB	-1.097** ^c (0.021)	-1.107** ^c (0.034)	-1.096** ^c (0.037)	-1.040** (0.030)
FEE	2.036** (0.288)	0.967** (0.343)	1.718** (0.515)	3.331** (0.400)

LASSETS	0.152** (0.026)	0.422* (0.199)	0.023 (0.203)	0.016 (0.056)
OPEXP	-2.499** (0.236)	-1.643** (0.283)	-2.722** (0.389)	-3.410** (0.393)
SHTRADAL	-4.446 (2.375)	-2.828 (9.730)	-6.805 (5.367)	-1.347 (2.341)
LHERF	0.031 (0.029)	0.042 (0.063)	0.024 (0.041)	0.032 (0.036)
GAPYear1994	-0.047** (0.010)	-0.034 (0.020)	-0.016 (0.016)	-0.074** (0.018)
GAPYear1995	-0.035** (0.009)	-0.014 (0.014)	-0.048* (0.020)	-0.064** (0.018)
GAPYear1996	-0.019* (0.010)	0.007 (0.012)	-0.030 (0.017)	-0.061** (0.024)
GAPYear1997	0.020* (0.010)	-0.000 (0.014)	0.033 (0.018)	0.030 (0.021)
GAPYear1998	0.030 (0.016)	0.027 (0.021)	0.063 (0.033)	-0.015 (0.033)
GAPYear1999	0.035* (0.015)	0.004 (0.016)	0.054 (0.030)	0.023 (0.030)
GAPYear2000	-0.011 (0.014)	-0.026 (0.018)	0.007 (0.016)	-0.041 (0.034)
GAPYear2001	-0.014 (0.014)	-0.006 (0.023)	-0.016 (0.019)	-0.067** (0.023)
GAPYear2002	-0.017 (0.015)	-0.034 (0.020)	0.003 (0.028)	-0.048 (0.028)
GAPYear2003	-0.040** (0.013)	-0.029 (0.019)	-0.010 (0.021)	-0.071** (0.023)
GAPYear2004	-0.028* (0.014)	-0.009 (0.032)	-0.024 (0.021)	-0.068** (0.024)
GAPYear2005	0.000 (0.011)	-0.003 (0.021)	0.006 (0.015)	-0.041 (0.022)
1/BV	0.795 (1.488)	7.866 (4.716)	-10.920 (13.817)	-46.204* (21.343)
Constant	-1.300** (0.520)	-4.942 (2.636)	0.691 (2.808)	0.756 (0.953)
Observations	4333	1285	1515	1533
Adjusted R-squared	0.9167	0.9219	0.9278	0.9155

Notes: Clustered (by bank) standard errors are in parentheses. Each equation also includes RESV, SEC, FF, and TRADA, with coefficients constrained to one, and TRADL with its coefficient constrained to minus one. Each equation also contains a set of annual dummy variables.

* Coefficient differs significantly from zero at the 1 percent level.

** Coefficient differs significantly from zero at the 5 percent level.

^a For asset categories, indicates that a coefficient differs significantly from one at the 1 percent level.

^b For asset categories, indicates that a coefficient differs significantly from one at the 5 percent level.

^c For liability categories, indicates that a coefficient differs significantly from minus one at the 1 percent level.

^d For liability categories, indicates that a coefficient differs significantly from minus one at the 5 percent level.

Table 5: Determinants of market value of banking organizations with small business loans separated by size: full sample and by bank size category

	All banks	Assets below 0.5 billion \$2005	Assets between 0.5 and 1.5 billion \$2005	Assets above 1.5 billion \$2005
	(1)	(2)	(3)	(4)
CI	0.977** (0.030)	0.998** (0.048)	0.996** (0.046)	0.969** (0.046)
SM1CI	0.162* (0.082)	0.284** (0.101)	0.096 (0.147)	-0.019 (0.156)
SM23CI	0.069 (0.055)	-0.003 (0.072)	0.021 (0.106)	0.185 (0.116)
CRE	1.049** (0.027)	1.076**. ^a (0.031)	1.026** (0.044)	1.044** (0.057)
SM1CRE	0.167 (0.132)	0.161 (0.190)	0.114 (0.209)	-0.066 (0.297)
SM23CRE	-0.029 (0.040)	-0.071 (0.046)	0.057 (0.074)	0.044 (0.105)
Observations	4333	1285	1515	1533
Adjusted R-squared	0.9169	0.9229	0.9278	0.9157

Notes: Clustered (by bank) standard errors are in parentheses. Each equation also includes RESV, SEC, FF, and TRADA, with coefficients constrained to one, and TRADL with its coefficient constrained to minus one. Each equation also contains a set of annual dummy variables.

* Coefficient differs significantly from zero at the 1 percent level.

** Coefficient differs significantly from zero at the 5 percent level.

Appendix - Definitions

Dependent Variable

MVBV: The ratio of the bank's market value to its book value. The market value is constructed as the average of daily market values for the month of July. The bank's book value is its total equity capital minus its perpetual preferred stock and capital surplus.

Loans and leases

CI: Total commercial and industrial loans; measured as the bank's total commercial and industrial loans, divided by the book value of the bank.

CRE: Total commercial real estate loans; measured as the bank's total loans secured by nonfarm nonresidential properties, divided by the book value of the bank.

CSTR: Total construction loans; measured as the bank's total construction, land development, and other land loans, divided by the book value of the bank.

RES: Total loans secured by 1-4 family residential properties; measured as the bank's total loans secured by 1-4 family residential properties, divided by the book value of the bank.

MULT: Total loans secured by multifamily residential properties; measured as the bank's total loans secured by multifamily residential properties, divided by the book value of the bank.

FARM: Total loans to farmers; measured as the sum of the bank's loans secured by farmland and loans to finance agricultural production and other loans to farmers, divided by the book value of the bank.

CCD: Total credit card loans; measured as the bank's credit card and other revolving plan loans, divided by the book value of the bank.

CONS: Total other consumer loans; measured as the bank's other consumer loans, divided by the book value of the bank.

OTHLNS: Total other loans; measured as the sum of the bank's loans to depository institutions, loans to foreign governments, loans made by the bank's foreign offices, and all other loans minus unearned income on all types of loans, divided by the book value of the bank.

LEAS: Total lease financing receivables; measured as the bank's total lease financing receivables, divided by the book value of the bank

Small business loans

Note, BHCs did not report their small business loans on a consolidated basis. Therefore, the small business loan series for BHCs were constructed by aggregating the small business loans held by the BHC's individual bank subsidiaries.

SMCI: Total small commercial and industrial loans; measured as the bank's total commercial and industrial loans with original amounts of less than or equal to \$1 million, divided by the book value of the bank.

SM1CI: Small commercial and industrial loans with original amounts of \$100,000 or less; measured as the bank's commercial and industrial loans with original amounts of \$100,000 or less, divided by the book value of the bank.

SM2CI: Small commercial and industrial loans with original amounts of more than \$100,000 through \$250,000; measured as the bank's commercial and industrial loans with original amounts of more than \$100,000 through \$250,000, divided by the book value of the bank.

SM3CI: Small commercial and industrial loans with original amounts of more than \$250,000 through \$1 million; measured as the bank's commercial and industrial loans with original amounts of more than \$250,000 through \$1 million, divided by the book value of the bank.

SM23CI: Small commercial and industrial loans with original amounts of more than \$100,000 through \$1 million; measured as the bank's commercial and industrial loans with original amounts of more than \$100,000 through \$1 million, divided by the book value of the bank.

SMCRE: Total small commercial real estate loans; measured as the bank's total real estate loans secured by nonfarm nonresidential properties with original amounts of less than or equal to \$1 million, divided by the book value of the bank.

SM1CI: Small commercial real estate loans with original amounts of \$100,000 or less; measured as the bank's real estate loans secured by nonfarm nonresidential properties with original amounts of \$100,000 or less, divided by the book value of the bank.

SM2CI: Small commercial real estate loans with original amounts of more than \$100,000 through \$250,000; measured as the bank's real estate loans secured by nonfarm nonresidential properties with original amounts of more than \$100,000 through \$250,000, divided by the book value of the bank.

SM3CI: Small commercial real estate loans with original amounts of more than \$250,000 through \$1 million; measured as the bank's real estate loans secured by nonfarm nonresidential properties with original amounts of more than \$250,000 through \$1 million, divided by the book value of the bank.

SM23CI: Small commercial real estate loans with original amounts of more than \$100,000 through \$1 million; measured as the bank's real estate loans secured by nonfarm nonresidential

properties with original amounts of more than \$100,000 through \$1 million, divided by the book value of the bank.

Other balance sheet items

OREO: Other real estate owned; measured as the bank's other real estate owned, divided by the book value of the bank.

SEC: Fair value of the bank's securities holdings; measured as the sum of the bank's securities held to maturity and available for sale securities, each measured at fair value, divided by the book value of the bank.

TRADA: Trading assets; measured as the bank's trading assets, divided by the book value of the bank.

FIX: Fixed assets; measured as the bank's premises and fixed assets, divided by the book value of the bank.

INTAN: Intangible assets; measured as the sum of the bank's goodwill and other intangible assets, divided by the book value of the bank.

RESV: Reserves; measured as the bank's cash and balances due from depository institutions, divided by the book value of the bank.

FF: Net federal funds sold and securities purchased under agreements to resell; measured as the bank's federal funds sold and securities purchased under agreements to resell net of the bank's federal funds borrowed and securities sold under agreements to repurchase, divided by the book value of the bank.

OTHA: Other assets; measured as the sum of the bank's investments in unconsolidated subsidiaries and associated companies, customers' liability on acceptances outstanding, and other assets, divided by the book value of the bank.

NPL: Nonperforming loans; measured as the sum of the bank's loans over 90 days past due and nonaccruing loans, divided by the book value of the bank.

LLR: Loan loss reserves; measured as the bank's allowance for loan and lease losses, divided by the book value of the bank.

CORE: Core deposits; measured as the sum of the bank's demand deposits, NOW and other transaction accounts, money market deposit accounts and other savings accounts, divided by the book value of the bank.

OTHDEP: Other deposits; measured as the bank's time deposits, divided by the book value of the bank.

TRADL: Trading liabilities; measured as the bank's trading liabilities, divided by the book value of the bank.

OTHLIAB: Other liabilities; measured as the sum of the bank's other borrowed money, liability on acceptances executed and outstanding, subordinated notes and debentures, minority interest in consolidated subsidiaries, perpetual preferred stock and related surplus, and other liabilities, divided by the book value of the bank.

Other control variables

FEE: Fee income; measured as the bank's total noninterest income net of service charges on deposit accounts in domestic offices and net gains (losses) on sales of loans, leases and other real estate owned, divided by the book value of the bank.

LASSETS: Bank assets; measured as the logarithm of the bank's total assets.

OPEXP: Noninterest (operating) expense; measured as the sum of the bank's expenses on salaries and employee benefits, expenses of premises and fixed assets, and other noninterest expense, divided by the total income of the bank (the sum of total interest income and total noninterest income).

SHTRADAL: Share of trading assets and liabilities in the total bank assets; measured as the sum of the bank's trading assets and trading liabilities, divided by the total assets of the bank.

LHERF: The logarithm of the Herfindahl index that measures the concentration of assets within a MBHC; constructed as follows:
$$LHERF = \text{Log} \sum_{i=1}^n \left(\frac{100 * \text{Assets of Subsidiary}_i}{\text{Sum of Assets of All Subsidiaries}} \right)^2$$

GAP: One year gap – a measure of interest sensitivity; measured as the bank's earning assets that are repriceable within one year or mature in one year, minus interest bearing deposit liabilities that reprice within one year or mature within one year, minus long-term debt that reprices within one year or matures within one year, divided by the book value of the bank.

Endnotes

¹ The report was prepared by Professor Peek, the principal investigator and by Professor Dmytro Holod, College of Business, SUNY at Stony Brook. We thank Charles Ou and participants at the 2006 Financial Management Association annual meetings for useful comments.

² Three exceptions are Carter et al. (2004), Ergungor (2005), and Bharath et al. (forthcoming).

³ Boot (2000) provides a good overview of the issues associated with relationship lending by banks.

⁴ See Berger and Udell (2006) for a discussion that classifies bank lending technologies into relationship lending and five types of transactional lending: financial statement lending, asset-based lending, factoring, fixed-asset lending, and small business credit scoring.

⁵ A number of recent papers have investigated the use of credit scoring models, for example, Cole, Goldberg, and White (2004); Berger, Frame, and Miller (2005); and DeYoung, Glennon, and Nigro (2005).

⁶ Bank data come from four sources:

1. Federal Reserve Board, Quarterly Consolidated Financial Statements for Holding Companies (Y9-C); reports available from the Federal Reserve Bank of Chicago's website: www.chicagofed.org/banking_information/financial_institute_reports_des_bhc_main.cfm

2. Federal Reserve Board, Consolidated Reports of Condition and Income for individual banks (call reports); available from the Federal Reserve Bank of Chicago's website:

www.chicagofed.org/banking_information/financial_institute_reports_des_call_main.cfm

3. National Information Center database; Federal Financial Institutions Examination Council (FFIEC), National Information Center: www.ffiec.gov/nicpubweb/nicweb/nichome.aspx.

This site can be used to search for structure information for individual banks. However, the call reports (item 2) contain variables that indicate the ownership of individual banks. These enable the researcher to construct the commercial bank membership of each holding company.

4. Center for Research in Security Prices (CRSP), University of Chicago Graduate School of Business, Chicago, Ill. CRSP data are available for sale from www.crsp.com.

⁷ In addition, information on farm-related loans with original sizes of \$500,000 or less also are collected for two categories: real estate loans secured by farmland in domestic offices and loans to finance agricultural production in domestic offices. The survey also disaggregates these loans into three size categories based on original loan amounts: less than or equal to \$100,000, more than \$100,000 through \$250,000, and more than \$250,000 through \$1 million (more than \$250,000 through \$500,000 for agricultural and farm loans).

⁸ Note that the set of asset and liability categories spans the entire balance sheet. Since many categories are correlated with other categories, a specification that excluded some asset or liability categories would suffer from severe omitted variables bias, since the estimated coefficients on the included variables would partially reflect the effects of the omitted (and correlated) categories.

⁹ Under generally accepted accounting principles (GAAP), intangible assets are not recorded unless they are purchased as part of a business combination transaction.

¹⁰ Technically, these are small loans rather than small business loans. For the most part, such small commercial and industrial and commercial real estate loans (less than \$1 million) are made primarily to small businesses. However, these loans represent only the smaller tail of the distribution of loans made to small businesses. It is likely that many small business loans are substantially larger than \$1 million.

¹¹ As an alternative measure to LHERF, we also considered a measure of the logarithm of the average size (using assets) of the bank subsidiaries of the banking organization. The results were not sensitive to this change in specification.