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SMALL BUSINESS BORROWING FROM LARGE AND SMALL BANKS

George W. Haynes
Montana State University

Charles Ou and Robert Berney
Small Business Administration

This study employs the 1993 National Survey of Small Business Finances to assess whether small business borrowers have less access to financial capital from large commercial banks than other borrowers. This study examines the influence of firm size and quality on the type of debt instruments held by small and large banks. Large banks do not appear to "cherry pick" the market by only offering loans to larger, higher quality small businesses. However, this study suggests that the smallest small business borrowers appear to have less access to financial capital, especially line of credit loans, from large banks than other small business borrowers.

Introduction

The implementation of the Riegle-Neal Banking and Branching Efficiency Act (RNBEA) of 1994 has stimulated unprecedented consolidation in the banking industry. From 1988 to 1997 the number of U.S. bank charters and the number of banking organizations declined by 30 percent and 27 percent, respectively (Berger, Demsetz and Strahan, 1999). The RNBEA effectively eliminates interstate barriers to entry in the banking industry. Through this legislation, bank holding companies can acquire banks and establish branches across state lines without approval by state bank regulators. This consolidation, manifested in mergers and acquisitions, has reduced the number of small banks in the U.S. and has introduced many small business borrowers to larger banking organizations (Berger and Udell, 1995). Large banking organizations may more efficiently deliver a larger array of financial services to a community, but to do this they must reduce the high transactions costs associated with small loans. This means loan officers cannot afford to spend time on small loans and must use more objective information of such things as credit scoring models rather than making labor intensive relationship or character loans.

Small business borrowers may prefer to borrow from smaller banks because they more effectively meet their needs. For instance, larger banks are more likely to rotate loans officers in larger accounts as they gain experience, making it more difficult to maintain a relationship with the bank, and merged banks may close down the office where the borrower established a strong lending relationship. These capital access issues are critical to small businesses, which account for approximately 50 percent of the employment and output in the U.S. economy (Berney, 1996).

Recent research on bank consolidation suggests that credit supplies to small business borrowers have been declining, especially in instances where large, complex banks are involved (Berger and Udell, 1995a). When large banks with a small percentage of small business loans merge with a smaller bank, credit supplies to small businesses also decline (Zardkoohi and Koari, 1997; and Peek and Rosengren, 1995). De novo bank entry has met some of this demand. In fact, several studies have found that these de novo banks tend to lend more to small businesses as a percentage of assets than smaller banks of similar size (DeYoung, Goldberg and White, 1999).

This study complements the work of these authors by assessing whether smaller small businesses have less access to bank credit from large banks than larger small businesses using the National Survey of Small Business Finances. This study examines the impact of commercial bank size on the use of debt instruments (line-of-credit, lease, mortgage, vehicle or equipment loans) by small business borrowers.

Literature Review

The previous literature on the impact of bank size on small business lending has been severely limited by available data. The Federal Deposit Insurance Corporation Improvement Act of 1991, however, requires that all banks include the number and dollar amount of their small loans to business and farms in their reports. These Call Reports have provided important new data for conducting research on the impact of bank size and have generated a substantial body of literature on the effects of bank size and bank consolidation on small business borrowing.

Small firms are heavily dependent on commercial banks for financial capital (Elliehausen and Wolken, 1990 and Cole and Wolken, 1995). Consequently, this literature review will examine the following: a) studies evaluating the transactions costs of offering loans to small business borrowers; b) studies assessing the importance of relationship lending; and c) studies considering the impact of mergers and acquisitions on the access of financial capital to small business.

Transactions Costs

If small firms are unprofitable customers because of higher lending costs, then the evidence should show that higher average costs are incurred when making small loans to small firms. Using data on the production characteristics of 340 banks participating in the Federal Reserve's Functional Costs Analysis Program and credit information on 21,669 loans, Murphy (1983) estimated a cost function to measure the existence of economies of scale for both the number of loans and the average size of loans. Murphy (1983) found that economies of scale exist in the commercial loan market; hence, small loans to small firms are relatively more costly loans for all lenders. In addition, high transactions costs effectively prevent small firms from utilizing other sources of capital often used by larger firms, such as public equity markets (Stoll, 1981; Stoll and Whaley, 1981; and Krinsky and Roteberg, 1991). Finally, the efforts by large banks to reduce transactions costs and improve marketing and organizational efficiency to make small business lending profitable were discussed by Laub (1992).

Relationship Lending

Small business borrowers may incur higher transactions costs in conducting business with larger banks, too. A recent Canadian study suggested that larger banks impose indirect transactions costs on small business borrowers because they are more likely to have loan officers with less longevity; hence, it is harder for a small business (which depends on relationship lending) to establish and maintain that relationship (Canadian Federation of Independent Business, 1994). However, Berger and Udell (1995b) and Peterson and Rajan (1994) suggest that relationship lending may benefit the smaller business in the long run in lower interest rates and collateral requirements. However, these papers did not analyze the importance of relationship lending by bank size.

Mergers and Acquisitions

Small business borrowers face other costs when their local bank is combined, through a merger or acquisition, with a larger commercial bank or bank holding company. Zardkoohi and Kolari (1997) used Call Report data on insured U.S. commercial banks, and data collected from bank managers involved in mergers and acquisitions from the U.S. Office of Management and Budget (OMB) to examine the effects of structural change on small business lending. They argue that bank mergers are more likely to have a greater impact on small businesses than acquisitions because mergers are more disruptive to management and information flows from small businesses. This destruction of information hurts small business borrowers. In addition, the

decision to grant credit is likely to be based on more tangible information, rather than intangible information, when mergers occur. Most importantly, this research confirmed that credit supplies to small firms have been declining due to bank mergers.

Previous research by Peek and Rosengren (1995) shows that small business loans declined when small banks are acquired by large banks. This study examined 13 bank acquisitions in New England from June 1993 to June 1994 and found that small business loans declined in 8 of 13 banks and increased in the other 5. A review of each acquisition by the authors revealed that "...most acquisitions by larger banks actually result in a shrinkage of small business loans." Hence, it appears that most acquisitions are driven by reasons other than acquiring small business loans from the smaller (acquired) banks. They may have acquired the smaller banks to increase core deposits, expand geographic diversification, reduce operating costs or a host of other reasons.

Berger and Udell (1995a) tested hypotheses on the relationship between small business loans and bank structure using data from the June 1994 Call Report, the Federal Reserve's Survey of Terms of Bank Lending to Business, and the Consolidated Report of Condition for bank holding companies. Using regression analysis, they confirmed the common notion that large, complex banks tend to make fewer small business loans than other banks. However, in their discussion they were careful not to infer that these findings suggest a contraction of credit available to small business borrowers. They suggest that community banks may have a competitive advantage over larger banks in supplying relationship-type loans demanded by small business borrowers. In fact, they suggest that the diseconomies realized by large banks may effectively put an upper limit on commercial bank growth via consolidation. Earlier work by Laub (1992) supported the Berger and Udell claim by suggesting that large banks have been relatively unsuccessful in soliciting small business credit. However, Laub (1992) draws a somewhat different conclusion over the long run by suggesting that a healthy competition exists between large and small banks, and that both small and large banks are positioned to serve small business borrowers profitably.

Strahan and Weston (1996) lend further support to Berger and Udell (1995). These authors measured the effects of bank consolidation of small business loans by examining bank holding company affiliations and bank mergers. They found that banks owned by large bank holding companies made fewer small business loans than other banks. From this evidence, they concluded that the costs of providing credit to small borrowers are lower for small banks. If small banks realize some economies in supplying credit services to small businesses, then they are likely to remain in the market (in other words, for some types

of lending, large banks do not have cost advantages). These authors do not believe that the on-going consolidation in the banking industry will decrease credit supplies to small businesses.

Keeton (1995) studied the effects of bank mergers and acquisitions from 1986 through 1995 using data collected from the June 1994 Call Report on small business loans for the Tenth District banks. This author found that multi-bank holding companies had significantly lower small business loan ratios than their peer group, and concluded that multi-office (highly branched) banking organizations tend to lend less to small businesses than other banks. In addition, Keeton (1995) found that mergers by out-of-state urban banks significantly lowered both business and farm lending, but this did not occur in the case of acquisitions.

Whalen (1995) focused on states with limited branching rules that restricted expansion within a single county and found that multi-office banking and interstate banking do not necessarily discriminate against small business borrowers. In fact, in many cases, these types of banking organizations are associated with increased small business lending.

Further work by Peek (1997) examined the influence of the degree of small business lending specialization of the acquiring and acquired banks on the credit availability to small business borrowers. Following a merger, surviving banks do tend to revert towards the pre-merger small business loan portfolio share of the acquirer. If the acquirer is an active small business lender that has chosen to focus on relationship lending to smaller borrowers, the acquisition could increase the small business lending of the consolidated institution. Peek concluded that when considering the implications of bank acquisitions on small business lending, the portfolio share of the small business lending of the acquirer may be as important as the acquirer's size.

This literature suggests that lending to small firms may impose higher transaction costs on lenders. Hence, larger banking organizations driven by efficiency concerns may be less willing to lend money to small businesses. Bank mergers, especially when the acquirer bank has less small business lending experience, may reduce the supply of credit to small business borrowers; and large banks may have some diseconomies in addressing the relationship-type lending demanded by small business. In general, this literature suggests that small business borrowers could expect to have less access to commercial bank credit from large commercial banks.

Conceptual Considerations

Public opinion, supported by some academic literature, suggests that mergers and acquisitions contribute to the lack of capital access for

small business borrowers. Limited evidence suggests that large banks are less interested in small business lending primarily because it is too costly to make small loans, and the institutional setup of large institutions is not conducive to relationship lending desired by small business borrowers. In order to exploit profit opportunities in the small business loan market, large banks need to focus on lower-cost small loan segments for entry into small business lending. Larger banks may rely more on objective financial information (Zardkoohi and Kolari, 1997) and credit scoring tools; foster less relationship lending (Berger and Udell, 1995); and centralize loan processing, which is likely to favor larger and older businesses; and have higher minimum loan sizes, which reduce transactions costs per dollar of loan and impose additional costs on small businesses not requiring larger loans. In addition, large banks may have the market power to select only the higher quality small business borrowers, leaving the marginal borrowers to the smaller banks and other lenders.

The lack of information about the lending behavior of small and large banks has made these arguments difficult to answer empirically. Arguably, the most important myth is that large banks are less interested in small business lending. Influences emanating from both the supply and demand side of the financial credit market may perpetuate this myth. On the supply side, larger commercial banks may prefer not to offer loans to small businesses because small loans impose higher transactions costs; are perceived to be riskier; and the institution may face diseconomies in supplying relationship lending. On the demand side, large banks may impose higher transactions costs on small business borrowers because the lender requires more comprehensive accounting and business planning information, and developing sustainable relationships with loan officers is more time consuming. In addition, the borrower may simply prefer to use a smaller lender because they perceive that the bank is friendlier. If relationship lending is important to smaller businesses; and larger commercial banks realize some diseconomies in supplying adequate borrower-lender relationships, then smaller banks should have a higher probability of attracting smaller borrowers.

Some types of borrowers may have better borrowing experiences with larger lenders than others. Larger banks may have the market power to effectively "cherry pick" the market for the best small business borrowers to satisfy their Community Reinvestment Act requirements. Small businesses with a good financial record, as indicated by the age, size and financial statements of the firms, would be good candidates to "cherry pick." In addition, some borrower's loans are too large for small banks; hence, these larger firms must solicit financial capital from larger banks. Larger, older and higher quality

firms should be more likely to be attracted by large banks than other firms.

Using the National Survey of Small Business Finances, this study will utilize information on the size of banks supplying loans and leases to small businesses to examine the lending behavior of small and large banks. This study will test the following hypotheses:

- (1) Large commercial banks have a higher probability of lending money to larger businesses than smaller businesses;
- (2) Large commercial banks have a higher probability of lending money to more financially secure businesses (businesses that are older, incorporated and higher financial quality) than less financially secure businesses (businesses that are younger, unincorporated and lower financial quality);
- (3) Large commercial banks hold a higher proportion of total loans for larger businesses than smaller businesses; and
- (4) Large commercial banks hold a higher proportion of total loans for more financially secure businesses (businesses that are older, incorporated and higher financial quality) than less financially secure businesses (businesses that are younger, unincorporated and lower financial quality).

Empirical Considerations

This section describes the data and empirical models used for this study. This study uses the 1993 National Survey of Small Business Finances (NSSBF) which is analyzed using descriptive statistics to describe borrowers using small and large banks and multivariate models to assess the access of small businesses to financial capital supplied by large versus small banks.

Data

The NSSBF is a survey conducted by the Federal Reserve's Board of Governors in 1993 (Cole and Wolken, 1995). The 1993 data set provides detailed financial information on 4,637 randomly selected small businesses representing 4.99 million of non-agricultural, non-financial businesses with less than 500 employees, and the size of the commercial bank lenders used by these borrowers. This study examines only small businesses who held at least one lease or loan and were using a commercial bank that could be identified by the Federal Reserve Bank. Using this selection criterion, 2,706 observations representing just over 2.5 million small businesses are employed for this study.

Nearly 25 percent of the businesses included in the NSSBF do not borrow any financial capital. In addition, no bank size information is provided for commercial banks that could not be identified by the Federal Reserve Bank, and they were deleted from the sample¹. The original sample of borrowers (2,970) is compared with the sample used for this study (2,706) for each of the variables in Table 1. In general, the samples appear to be very similar.

Methods

This section defines each dependent and independent variable, discusses methods of empirically measuring them, and presents an empirical model for testing the hypotheses generated from the conceptual framework.

When assessing the probability of holding a loan from a small or large bank, the primary dependent variables are dichotomous variables indicating: a) whether the business has leases or loans outstanding with different size lenders; and b) whether the business uses different types of debt instruments (i.e., lease and line-of-credit, mortgage, vehicle, equipment or other loans) offered by different size lenders. When assessing the shares of total debt, the dependent variables are continuous variables between 0 and 1, indicating the share of total debt held by each size lender in each loan or lease type. Small banks are those institutions with assets of less than \$500 million, while large banks are those institutions with assets of \$500 million or more.

The primary independent variables are those chosen to measure the size, age and financial quality (i.e., credit riskiness) of the business. The size is measured by the number of employees in the business. The age is measured by the number of years since the firm was started, founded or acquired. Since creditworthy, high-risk borrowers may be denied a loan when credit is rationed, an appropriate measure of borrower quality is crucial. Embodied in this measure of quality must be the same criterion used by lenders to assess borrower quality, since lenders are the ones ultimately determining the quality of the borrower. Borrower quality is often evaluated by assessing the repayment history and the character of the loan applicant. Unfortunately, neither of these characteristics is directly available in this data set. The closest measure available in the data set is financial statement information, which measures the personal wealth and the financial stability of the business. This study measures business quality by using an Altman Z statistic derived from the financial statement information provided in the NSSBF. Undoubtedly, the Altman Z statistic is not the perfect measure of firm quality, even though similar, albeit proprietary, models are used in the financial services industry to evaluate loan quality.

In this model, the demand for financial capital is held constant; therefore, the control variables capture other factors that may cause the demand for financial capital to change. When attempting to model the financial capital market for small businesses, non-financial and financial characteristics of the business and individual and market variables are employed as control variables. The independent variables used as control variables include the following: type of legal organization, standard industrial classification, rural or urban location, Census Region, gender and race of the majority owner(s), and total amount of debt held by the borrower. In addition, control variables are added to the model to indicate other sources of money used by the borrower, including: owner loans; personal and business credit cards; credit union, finance company, thrift, family, and government loans; and the types of loans used by the borrower (line of credit, lease, mortgage, vehicle, equipment and other loans).

The empirical models estimate the probability that the borrower uses a specific size lender offering each of the six debt instruments (line of credit, lease, mortgage, vehicle, equipment or other loans); and the proportion of total debt outstanding which is held by a specific size lender offering each of the six debt instruments. In this study two classifications of borrowers are employed: a) borrowers using only small banks; and b) borrowers using large banks. Borrowers using large banks include borrowers using small and large banks, and those using only large banks.

Logistic regression will be employed to assess the probability that a borrower would use a small or large commercial bank lender to hold a certain type of lease or loan. In these regressions, the dependent variable is a discrete outcome, such as whether the business holds a loan from a large commercial bank. Hence, conventional linear regression methods are inappropriate. A linear probability model could be employed; however, the error term is heteroscedastic and dependent upon on the β coefficient (Green, 1990). This heteroscedasticity problem can be resolved using generalized least squares; however, $\beta'x$ can not be constrained to the 0–1 interval, hence, nonsense probabilities and negative variances may result. The SAS computer program is used for the logistic regression analysis (SAS, 1985).

Ordinary least squares regressions will be employed to examine the share of total debt borrowed from a small and/or large commercial bank lender. In these regressions a relatively high percentage of the borrowers do not hold any loans with a commercial bank, hence other regression methods may be more appropriate, such as a Tobit model (Green, 1990 and Tobin, 1958).

The first set of logistic regressions will assess the probability of using a small and/or large commercial bank lender. In this instance,

the dichotomous dependent variable, labeled $BANK_i$, indicates whether a specific lender is used. The following model is employed to test whether small businesses have a higher probability of borrowing from small or large commercial lenders for each type of loan:

$$BANK_{ij} = \alpha_0 + \alpha_1 \text{ firm size} + \alpha_2 \text{ firm quality} + \alpha_3 \text{ firm age} + \alpha_4 \text{ firm and} \quad (1) \\ \text{borrower characteristics} + \alpha_3 \text{ financial market characteristics} + \\ \alpha_4 \text{ total debt amount} + \alpha_5 \text{ lender and loan type} + \varepsilon$$

where i = each size (small and large) of commercial bank lenders used
by the borrower.

j = each type of loan

A separate regression equation is analyzed for borrowers using small or large commercial bank lenders for each loan type. Based on the conceptual framework, smaller business borrowers are less likely to hold a commercial bank loan from a large bank than larger business borrowers. Therefore, α_1 is expected to be positive when the lender is a large commercial bank. In addition, older and higher quality firms are more likely to hold a commercial bank loan from a large bank. Therefore, α_2 and α_3 are expected to be positive when the lender is a large bank. In addition, these three coefficients (α_1 , α_2 and α_3) are expected to be positive and significant for line of credit loans, but not significant for all other loans.

Ordinary least squares regressions will be used to assess the determinants of the shares of total debt held by each size of commercial bank lender for each type of debt instrument. The first set of linear regression models assesses whether smaller businesses acquire a lower proportion of their total debt from large commercial banks than larger businesses. A regression equation specified the same as equation (1) is employed, except the dependent variable is changed to $BNKSHR_{ij}$, which is the proportion of total debt held by large or small commercial bank lenders for each loan type.

A separate regression equation is analyzed for each loan type. Based on the conceptual framework, smaller businesses are expected to have a smaller proportion of their debt held by large commercial banks. Therefore, α_1 is expected to be positive when the lender is a large bank. Older and higher quality firms are more likely to have a higher proportion of their debt held by a large bank, therefore, α_2 and α_3 are expected to be positive when the lender is a large bank. In addition, these three coefficients (α_1 , α_2 and α_3) are expected to be positive and significant for line of credit loans, but not significant for all other loans.

Results

This section reports the results of a univariate analysis to examine the characteristics of borrowers using small and large commercial banks; and a multivariate analysis which examines the likelihood of utilizing small and large banks; and the share of total debt held by them.

Univariate Analysis

This study utilizes simple descriptive statistics and analytical models to assess the hypotheses outline in the conceptual considerations section. Initially, univariate statistics will be employed to examine the characteristics of borrowers using small and large commercial banks. This univariate analysis will focus on the impact of the size, age and location of the firm utilizing small and large commercial banks. The analytical model section examines the impact of size, age and location after controlling for other variables effecting the demand for financial capital.

Table 2 examines the proportion of borrowers using small or large commercial banks classified by the number of employees, sales, standard industrial classification (SIC), age of the firm, legal organization, location (urban versus rural and census region), race and gender. This univariate analysis reveals that large firms are more likely to use large banks. Small banks serve about 27 percent of firms with fewer than 100 employees; however, they serve just over 16 percent of larger small businesses with 100 employees or more. Large banks serve about 35 percent of smaller businesses; however, they serve over 60 percent of firms with 20 or more employees. A similar result is revealed when total sales replaces number of employees as a proxy for firm size.

Several other determinants, including SIC classification, age, legal organization, location and race and gender of the owner, are considered in Table 2. In the univariate analysis, both small and large banks are not significantly more likely to loan money to any specific standard industrial classification. Small banks appear to attract a slightly higher percentage of younger firms. Large banks attract a significantly higher percentage of older firms (4 years and older) than younger firms. Small banks appear to attract a significantly higher percent of partnerships, while large banks attract a lower percentage of sole proprietors than any other legal organization. Small banks attract a significantly higher percentage of rural businesses. Large banks, often located in urban areas, attract a higher percentage of urban businesses. Small banks appear to attract a lower percentage of borrowers in the Northeast than in any other Census Region. Large banks attract a lower percentage of borrowers in the North Central Region than in any other Census Region. Small banks appear to attract a

smaller percentage of minority business and about the same percentage of men- and women-owned small business borrowers. Large banks attract similar percentages of minority and non-minority and men- and women-owned small business borrowers. This evidence suggests that smaller banks are dealing with more information problematic borrowers, not the cookie-cutter type.

When considering the share of total loans held by small or large commercial bank lenders, a very similar picture emerges (Table 3). Small banks hold over 20 percent of total loans for those firms with fewer than 20 employees, but just over 10 percent for those firms with 100 or more employees. On the other hand, large banks hold about the same percentage of total loans for small firms as small banks; however, they hold a relatively high percentage of total loans for larger firms (over 40 percent for firms with 20 or more employees). A similar result is revealed when total sales is used as a proxy for firm size.

Small banks hold a smaller percentage of total loans for manufacturing, transportation and FIRE firms, and a larger percentage for construction, mining and wholesale trade firms (Table 3). Large banks hold a small percentage of total loans for construction, mining and services firms and a large percentage for FIRE firms. While small firms hold about the same proportion of debt for all firms by age, large banks hold a significantly larger proportion of debt for older firms. Small banks hold a larger percentage of debt held by partnerships and a lower percentage of debt held by general corporations. Large firms hold a smaller percentage of total debt for sole proprietors than any other legal organization type. Small banks hold just over 15 percent of total debt held by urban firms, and over 40 percent of the debt held by rural firms. Large banks hold over 30 percent of the debt held by urban firms, but just over 21 percent of the debt held by rural firms. Small banks hold a small percentage of total loans from firms located in the Northeast and South. Large banks hold about the same percentage of total loans across each Census Region. Small banks hold a smaller percentage of total loans to minority- than non-minority-owned businesses. Large banks hold about the same percentage of total loans for the minority- and non-minority-owned businesses. Both small and large banks hold similar percentages of total debt for men- and women-owned businesses.

The univariate analysis suggests that business size, age, and urban location are important determinants of the probability of borrowing from large and small banks. Table 4 examines the probability of using a small bank or large bank for firms classified by size (less than 10 employees or 10 or more employees), age (less than 10 years of age or 10 years of age or older), and urban location. While the probability of using a commercial bank proved statistically insignificant for borrowers classified by age and size using small banks only, they were

statistically significant for firms using large banks. Smaller, younger firms were significantly less likely to use a large bank (33 percent) than larger, older firms (56.3 percent). In addition, this result was statistically significant for borrowers located in urban areas, where larger, older firms were significantly more likely to utilize a large bank (60 percent) than younger, smaller firms (33.8 percent).

When examining each type of loan, large banks appear to attract larger, older firms for line of credit loans (Table 4.1). Smaller, younger firms are significantly less likely to acquire a line of credit loan from a large bank (12.8 percent) than a larger, older firm (40 percent). In urban areas the differences are even greater. Smaller, younger firms are significantly less likely to acquire a line of credit loan from a large bank (13.5 percent) than larger, older firms (43 percent). When examining the other types of loans (Tables 4.2–4.6), larger, older firms seem to have a higher probability of acquiring leases (1.2 percent to 4.8 percent), and equipment loans (5.3 percent versus 15.8 percent) from large banks than smaller, younger firms. Larger, older firms located in urban areas have a higher probability of acquiring leases (0.8 percent versus 5.6 percent), and equipment loans (5.3 percent versus 16.6 percent) from large banks than smaller, younger firms.

Not only do larger, older borrowers have a higher probability of borrowing from larger banks, but they hold a higher percentage of their debt with large banks (Table 5). Larger, older borrowers have nearly 42 percent of total debt held by large banks, while smaller, younger firms have less than 26 percent of total debt held by large banks. In urban areas larger, older borrowers have a significantly larger proportion of total loans (44.4 percent) held by large banks than smaller, younger borrowers (26.3 percent).

A similar result is found for line of credit loans, leases, and equipment loans (Tables 5.1–5.6). Larger, older line of credit borrowers have over 20 percent of total debt in line of credit loans held by large banks while smaller, younger borrowers have just over 7 percent of total debt in line of credit loans held by large banks. In urban areas the differences are somewhat more dramatic, where smaller, younger borrowers have a significantly lower percentage of total debt in line of credit loans held by large banks than larger, older businesses (7.8 percent versus 22.3 percent). Larger, older small businesses have a higher percentage of total debt in leases held by large banks than smaller, older small businesses (0.5 percent versus 2.1 percent), especially in urban areas (0.3 percent versus 2.4 percent). A similar pattern is found in equipment loans, where larger, older equipment loan borrowers have 8 percent of their total debt in equipment loans held by large banks, while smaller, younger firms have less than 4 percent of their total debt in equipment loans (Table 5.5). Similar differences are

found in urban areas where smaller, younger firms have just over 4 percent of total debt in equipment loans held by large banks, while larger, older firms have over 8 percent.

Multivariate Analysis

The univariate analysis considers the impact of firm size, age, and location; however, firm quality, legal organization, SIC classification, census region location, gender and race of the owner, total loan amount, and borrowing behavior (what types of lenders and loans are used by the borrower) are not considered. A multivariate model is employed to incorporate this set of control variables and assess the relationship between firm size and the probability of borrowing from small or large commercial banks.

Table 6 suggests that larger firms are significantly more likely to borrow from large banks. It is interesting to observe the difference in sign and in the level of significance for these variables in regression results for large and small banks. In the small bank loan regression, small banks were less likely to attract large businesses; and they were significantly more likely to attract partnerships than general corporations; mining firms than service firms; and firms in the North Central and South Regions than in the West Region. Small banks were significantly less likely to attract urban businesses; firms in the Northeast than in the West; and minority-owned firms. In the large bank regression, large banks were significantly more likely to attract urban businesses and those located in the North Central region; and less likely to attract sole proprietorships and mining companies.

The results are significant for the line of credit and equipment loans (Table 6.1). For small bank estimates, the sign is negative and significant for the firm size variable only for line of credit and equipment loans. For the large bank estimates, the signs are positive and significant for the variables firm size and age for line of credit loans only.

Table 7 examines the shares of total debt held by borrowers using small or large banks. While large businesses held a significantly smaller percentage of total debt in small banks, the size, age and quality variables were not statistically significant for borrowers using a large bank. Using the small bank regression, small banks held a larger percentage of total debt with partnerships than general corporations; mining companies than service companies; firms located in the North Central and Southern Regions than in the Western region; and firms with larger amounts of debt outstanding. Conversely, small banks held a smaller percentage of debt for FIRE firms than service firms; firms located in urban areas; and minority-owned businesses. Using the large bank regression, large banks held a smaller percentage of total debt for subchapter s corporations, mining firms and firms located in the North Central Region. Large banks held a larger percentage of total debt for

firms located in urban areas, those located in the Northeast region and firms with a larger amount of total debt outstanding.

When considering the influence of lenders and loan types on the share of debt held by small and large banks, both bank sizes hold a significantly lower percentage of total debt for firms borrowing from other sources. Small banks hold a larger percentage of debt for firms with line of credit and other loans, while large banks hold a larger percentage of total debt for firms using all types of debt, except equipment loans.

Similar results are found for line of credit loans only. In this one instance, small banks hold a significantly smaller percentage of total debt in line of credit loans for larger firms. Conversely, large banks hold a significantly larger percentage of total debt in line of credit loans for larger firms. Further details are included in Table 7.1.

Conclusions

This empirical study considered four hypotheses: (1) Large commercial banks have a higher probability of lending money to larger businesses than smaller businesses; (2) Large commercial banks have a higher probability of lending money to more financially secure businesses, those businesses that are older, incorporated and have better financial statements (as measured by the Altman Z statistic) than other small businesses; (3) Large commercial banks hold a higher proportion of total loans for larger businesses than smaller businesses; and (4) Large commercial banks hold a higher proportion of total loans for more financially secure businesses, those businesses that are older, incorporated, and have better financial statements than other small businesses. Based on data from the NSSBF, the first two hypotheses are generally true—large commercial banks have a higher probability of lending money to larger and older small businesses. However, the firm quality variable was not significant in any of the regressions. The third and fourth hypotheses were false—large and small firms, differentiated by age and quality, have similar shares of total debt held by large banks.

This study indicates that smaller small businesses are less likely to utilize loan services from larger banks, where this trend is evident in urban markets more than in rural markets. In some instances, small banks are simply unable to meet the loan demands of larger businesses; hence, these borrowers utilize larger banks. However, the fact that smaller businesses are less likely to utilize larger banks, even in urban markets, suggests that access to financial capital from larger banks is more difficult to obtain for smaller businesses.

This basic pattern of financial capital access was most prominent in line of credit loans. Lenders market several loan instruments to

their borrowers based on the demands of the borrowers. Four loan instruments might be deemed traditional loans, including line of credit, vehicle, equipment and mortgage loans. Three of these traditional loans (vehicle, equipment and mortgage loans) are asset-backed loans and pose a minimal amount of credit risk to the lender. Line-of-credit loans are not asset-backed loans; hence, the lender must solicit other forms of capital to secure these loans. Thus, a line-of-credit loan requires more confidence in the borrower's ability to repay the loan, and more information about the borrower. In addition, the line-of-credit loan gives the borrower a source of credit that is less costly to utilize. While the other types of loans offered by the lender assume that the borrower will borrow a fixed sum of money and repay the loan at some defined time in the future, the line-of-credit loan allows borrowers to use as much of the line-of-credit as they deem necessary. During times of high cash demands, the line-of-credit loan balance may approach the maximum allowed, while during times of low cash demands the line-of-credit loan balance may approach zero. If the rate of interest across all types of loans is the same, the total interest costs of line-of-credit loans should be lower than for other types of loans. Hence, borrowers who are unable to qualify for line-of-credit loans face times when they are paying interest on excess cash and, subsequently, incur higher loan costs.

If small business borrowers have more difficulty acquiring a line of credit loan from large commercial banks, these borrowers may go elsewhere. In fact, Berger and Udell (1995) suggest that other lenders may be more efficient suppliers of the relationship-type lending demanded by small businesses. However, small businesses unable to obtain financial capital from commercial banks may simply drop out of the market. At best, borrowers unable to obtain financial capital will incur additional search costs as they attempt to acquire financial capital elsewhere. Unfortunately, this sample does not have any firms that have chosen to go out of business (or never start a business) because they were denied financing.

Commercial bank institutions are an important source of financial capital for small businesses. They offer a wide array of financial services demanded by most small businesses (such as checking accounts, night deposit facilities and credit card clearing), and they have offices in most communities. Other institutional lenders, especially thrifts, savings banks and others, offer some subset of the services offered by commercial banks. The wide array of financial services offered by commercial banks makes them a convenient and efficient place to purchase financial services. Hence, the transaction and search costs of purchasing the full set of financial services from commercial banks are normally lower than for other institutional and non-institutional lenders.

If small business borrowers have less access to line of credit loans from large commercial banks, these borrowers incur higher search and transaction costs than other borrowers. In a competitive product market, these types of borrowers may be less efficient producers earning lower profits than similar businesses. This becomes an especially important concern for small businesses, such as locally owned copy centers, attempting to compete with large franchise or company store organizations with access to services provided by larger lenders.

This sample considers the borrowing behavior of those businesses that have realized some level of success in running a small business. While one might argue that large banks effectively screen out small businesses, it could be the case that small businesses choose not to utilize large banks. The larger banks may not supply the type of lending relationship demanded by the small business borrower. Larger banks may not be able to respond quickly enough to changes in loan agreements or maximum lines of credit to accommodate rapidly growing small businesses. The larger bank may not know the borrower or the product or service sold by the small business. In other cases, the merger or acquisition may change the loan officers (or at least, their authority) and may encourage small business borrowers to look elsewhere for their loans.

Further research is needed to define and assess the characteristics of unprofitable borrowers. Large bank lenders may perceive that some types of borrowers are more profitable than others. For instance, larger, older, corporations may be preferred to smaller firms with less experience and less formal legal organizations. As suggested above, some types of lending are more standardized and cost less to implement. Hence, larger lenders may prefer borrowers requesting vehicle loans, rather than line of credit or equipment loans and leases. Firms requiring relatively high monitoring costs may be less preferred by large lenders because they have other opportunities to lend money more efficiently (higher profit/loan amount).

The RNBEA has certainly changed the rules of the game and given small businesses the opportunity to utilize larger banking organization in many communities. This study suggests that the smallest small business borrowers appear to have less access to financial capital, especially line of credit loans, from large banks than other small business borrowers. Regardless of whether these borrowers have less access because of demand-or-supply-side concerns, these borrowers are likely to incur higher search and transactions costs than other businesses acquiring financial capital. De novo banks are certainly meeting some of this need; however, public policy intervention and educational programs may be needed to help small business borrowers gain access to larger banks.

George W. Haynes is an assistant professor in the Department of Health and Human Development at Montana State University. He has recently published articles in Small Business Economics, Journal of Small Business Management, Economic Development Quarterly, and Family Business Review. Haynes has a Ph.D. in consumer economics and housing from Cornell University.

Charles F. Ou is a senior economist in the Office of Research at the U.S. Small Business Administration (SBA). Before joining the SBA in 1987, he taught economics at the University of Dayton and the Queens College in North Carolina. Ou has a Ph.D. in economics from the University of North Carolina at Chapel Hill.

Robert E. Berney acts as chief economist for the Office of Advocacy in the U.S. Small Business Administration. He also is an economics professor at Washington State University. Berney has a Ph.D. in economics from the University of Wisconsin–Madison.

TABLE 1

Characteristics of Borrowers Using and Not Using FRB Regulated Banks

Category		All Borrowers	FRB Borrowers
		<i>(proportions)</i>	
Employees	less than 1	0.095	0.098
	1 to 4	0.422	0.423
	5 to 9	0.198	0.199
	10 to 19	0.107	0.104
	20 to 99	0.105	0.103
	100 or more	0.015	0.014
Sales	Less than 25,000	0.048	0.048
	25,000 - 49,999	0.066	0.068
	50,000 - 99,999	0.102	0.106
	100,000 - 249,999	0.249	0.249
	250,000 - 499,999	0.170	0.173
	500,000 - 999,999	0.148	0.147
	1,000,000 - 2,499,999	0.107	0.106
	2,500,000 - 4,999,999	0.051	0.048
	5,000,000 - 9,999,999	0.029	0.029
10,000,000 or more	0.029	0.026	
SIC	Mining	0.006	0.007
	Construction	0.149	0.149
	Manufacturing	0.095	0.093
	Transportation	0.034	0.035
	Wholesale trade	0.092	0.090
	Retail trade	0.223	0.225
	Finance, insurance & real estate	0.070	0.072
	Services	0.330	0.329
Age of Firm	less than 4 years	0.102	0.103
	4 to 10 years of age	0.351	0.350
	10 to 20 years of age	0.337	0.337
	Greater than 20 years of age	0.210	0.211
Legal Organization	sole proprietorship	0.364	0.371
	partnership	0.080	0.080
	sub-chapter s corporation	0.233	0.230
	general corporation	0.323	0.319
Location	Urban	0.778	0.774
Census Region	Northeast	0.218	0.218
	North Central	0.246	0.240
	West	0.235	0.238
	South	0.301	0.304
Race	Hispanic	0.042	0.042
	Black	0.029	0.029
	Asian	0.029	0.027
	American Indian & multiple race	0.009	0.008
	White	0.891	0.894
Gender	Female	0.191	0.194
Observations		2,970	2,706

TABLE 2

Proportion of Borrowers Using Small and Large FRB Regulated Banks

Category	Bank Size		
	Small Bank Only	Large Bank Only	
	<i>(proportions)</i>		
Employees	less than 1	0.263	0.317
	1 to 4	0.273	0.350
	5 to 9	0.285	0.392
	10 to 19	0.266	0.457
	20 to 99	0.262	0.576
	100 or more	0.162	0.725
Sales	Less than 25,000	0.181	0.295
	25,000 - 49,999	0.258	0.266
	50,000 - 99,999	0.324	0.255
	100,000 - 249,999	0.264	0.362
	250,000 - 499,999	0.285	0.364
	500,000 - 999,999	0.293	0.433
	1,000,000 - 2,499,999	0.264	0.510
	2,500,000 - 4,999,999	0.306	0.527
	5,000,000 - 9,999,999	0.205	0.695
	10,000,000 or more	0.125	0.671
SIC	Construction and Mining	0.310	0.360
	Manufacturing	0.241	0.426
	Transportation	0.269	0.415
	Wholesale trade	0.328	0.424
	Retail trade	0.288	0.379
	Finance, insurance & real estate	0.226	0.464
	Services	0.242	0.382
Age of Firm	less than 4 years	0.298	0.296
	4 to 10 years of age	0.260	0.369
	10 to 20 years of age	0.285	0.410
	Greater than 20 years of age	0.253	0.451
Legal Organization	sole proprietorship	0.270	0.313
	partnership	0.345	0.415
	sub-chapter s corporation	0.276	0.422
	general corporation	0.248	0.458
Location	Rural	0.499	0.283
	Urban	0.204	0.425
Census Region	Northeast	0.136	0.425
	North Central	0.406	0.329
	West	0.316	0.412
	South	0.199	0.403
Race	Hispanic	0.153	0.387
	Black	0.137	0.336
	Asian	0.159	0.368
	American Indian & multiple race	0.191	0.393
	White	0.284	0.396
Gender	Men-owned business	0.276	0.400
	Women-owned business	0.246	0.362

TABLE 3

Share of Total Held by Small and Large FRB Regulated Banks

Category		Bank Size	
		Small Bank Only	Large Bank Only
		<i>(proportions)</i>	
Employees	less than 1	0.224	0.249
	1 to 4	0.217	0.267
	5 to 9	0.225	0.272
	10 to 19	0.194	0.328
	20 to 99	0.195	0.418
	100 or more	0.102	0.531
Sales	Less than 25,000	0.125	0.249
	25,000 - 49,999	0.212	0.231
	50,000 - 99,999	0.278	0.199
	100,000 - 249,999	0.212	0.276
	250,000 - 499,999	0.230	0.255
	500,000 - 999,999	0.227	0.310
	1,000,000 - 2,499,999	0.189	0.347
	2,500,000 - 4,999,999	0.241	0.405
	5,000,000 - 9,999,999	0.148	0.490
10,000,000 or more	0.065	0.493	
SIC	Construction and Mining	0.236	0.260
	Manufacturing	0.161	0.309
	Transportation	0.197	0.308
	Wholesale trade	0.248	0.323
	Retail trade	0.228	0.287
	Finance, insurance & real estate	0.189	0.377
Age of Firm	Services	0.205	0.272
	less than 4 years	0.216	0.230
	4 to 10 years of age	0.200	0.274
	10 to 20 years of age	0.235	0.296
Legal Organization	Greater than 20 years of age	0.201	0.339
	sole proprietorship	0.220	0.235
	partnership	0.303	0.334
	sub-chapter s corporation	0.217	0.298
Location	general corporation	0.181	0.338
	Rural	0.412	0.214
	Urban	0.156	0.313
Census Region	Northeast	0.116	0.303
	North Central	0.325	0.263
	West	0.252	0.315
	South	0.142	0.274
Race	Hispanic	0.121	0.288
	Black	0.100	0.233
	Asian	0.118	0.255
	American Indian & multiple race	0.180	0.268
	White	0.225	0.294
Gender	Men-owned business	0.218	0.294
	Women-owned business	0.196	0.274

TABLE 4
Probability of Using a Small or Large Bank for Any Loan by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more
Less than 10	0.266	0.281	0.448	0.549	0.214	0.188			
10 or more	0.278	0.247	0.457	0.484	0.244	0.197			
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.330	0.377	0.301	0.241	0.338	0.425			
10 or more	0.466	0.563	0.297	0.390	0.498	0.600			

All significant differences (significance level = 5 %) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 4.1
Probability of Using a Small or Large Bank for a Line of Credit Loan by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm		Probability of Using a Small Bank Only	Age of the Firm		Probability of Using Large Bank	Age of the Firm		Probability of Using Large Bank
	Less than 10 years	10 years or more		Less than 10 years	10 years or more		Less than 10 years	10 years or more	
Less than 10	0.141	0.146	0.240	0.295	0.112	0.095			
10 or more	0.194	0.173	0.255	0.300	0.182	0.146			
Probability of Using Large Bank									
Less than 10	0.128	0.193	0.104	0.111	0.135	0.221			
10 or more	0.301	0.403	0.186	0.258	0.323	0.434			

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 4.2
Probability of Using a Small or Large Bank for a Lease by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	Probability of Using a Small Bank Only	Less than 10 years	10 years or more	Probability of Using a Small Bank Only	Less than 10 years	10 years or more	Probability of Using a Small Bank Only
Less than 10	0.010	0.001		0.013	0.005		0.008	0.000	
10 or more	0.030	0.008		0.046	0.013		0.027	0.007	
Probability of Using Large Bank									
Less than 10	0.012	0.010		0.024	0.000		0.008	0.013	
10 or more	0.036	0.048		0.004	0.011		0.042	0.056	

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 4.3
Probability of Using a Small or Large Bank for a Mortgage Loan by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more
Less than 10	0.043	0.041	0.086	0.075	0.031	0.029			
10 or more	0.051	0.030	0.169	0.095	0.028	0.016			
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.043	0.052	0.060	0.037	0.038	0.057			
10 or more	0.042	0.045	0.028	0.047	0.044	0.045			

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 4.4
Probability of Using a Small or Large Bank for a Vehicle Loan by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	Probability of Using a Small Bank Only	Less than 10 years	10 years or more	Probability of Using a Small Bank Only	Less than 10 years	10 years or more	Probability of Using a Small Bank Only
Less than 10	0.090	0.101	0.164	0.177	0.069	0.074	0.073	0.074	0.053
10 or more	0.073	0.074	0.204	0.175	0.048	0.053	0.073	0.074	0.053
Probability of Using Large Bank									
Less than 10	0.114	0.138	0.107	0.114	0.116	0.147	0.107	0.114	0.147
10 or more	0.107	0.155	0.115	0.149	0.105	0.156	0.107	0.115	0.156

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 4.5
Probability of Using a Small or Large Bank for an Equipment Loan by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more
Less than 10	0.068	0.049	0.049	0.140	0.110	0.110	0.047	0.047	0.028
10 or more	0.101	0.078	0.078	0.192	0.230	0.230	0.084	0.084	0.045
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.053	0.038	0.038	0.051	0.043	0.043	0.053	0.053	0.036
10 or more	0.089	0.158	0.158	0.049	0.122	0.122	0.096	0.096	0.166

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 4.6
Probability of Using a Small or Large Bank for an Other Loan by Number of Employees and Age of the Firm

Number of Employees	All Firms		Rural Firms		Urban Firms	
	Age of the Firm		Age of the Firm		Age of the Firm	
	Less than 10 years	10 years or more	Less than 10 years	10 years or more	Less than 10 years	10 years or more
Less than 10	0.043	0.048	0.080	0.089	0.032	0.034
10 or more	0.048	0.053	0.005	0.151	0.056	0.031
Probability of Using a Small Bank Only						
Probability of Using Large Bank						
Less than 10	0.047	0.030	0.060	0.023	0.043	0.033
10 or more	0.025	0.045	0.010	0.068	0.028	0.040

All significant differences (significance level = 5 %) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 5
Share of Total Loans Held by Small or Large Banks for Any Loan by Number of Employees and Age of the Firm

Number of Employees	All Firms		Rural Firms		Urban Firms	
	Age of the Firm		Age of the Firm		Age of the Firm	
	Less than 10 years	10 years or more	Less than 10 years	10 years or more	Less than 10 years	10 years or more
Less than 10	0.207	0.233	0.371	0.451	0.160	0.157
10 or more	0.185	0.190	0.375	0.405	0.150	0.144
Probability of Using a Small Bank Only						
Probability of Using Large Bank						
Less than 10	0.253	0.275	0.220	0.196	0.263	0.302
10 or more	0.317	0.417	0.162	0.293	0.346	0.444

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 5.1
Share of Total Loans Held by Small or Large Banks for Line of Credit Loans by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more
Less than 10	0.072	0.074	0.123	0.123	0.132	0.057	0.057	0.054	
10 or more	0.061	0.075	0.133	0.133	0.116	0.047	0.047	0.066	
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.071	0.087	0.050	0.050	0.056	0.078	0.078	0.098	
10 or more	0.163	0.201	0.089	0.089	0.097	0.177	0.177	0.223	

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 5.2
Share of Total Loans Held by Small or Large Banks for Leases by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more
Less than 10	0.003	0.001	0.001	0.005	0.003	0.003	0.003	0.003	0.000
10 or more	0.005	0.004	0.004	0.025	0.001	0.001	0.001	0.001	0.004
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.005	0.007	0.007	0.011	0.000	0.003	0.003	0.003	0.009
10 or more	0.015	0.021	0.003	0.003	0.007	0.018	0.018	0.018	0.024

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 5.3
Share of Total Loans Held by Small or Large Banks for Mortgage Loans by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more
Less than 10	0.029	0.030	0.030	0.051	0.060	0.060	0.023	0.023	0.019
10 or more	0.030	0.017	0.017	0.086	0.054	0.054	0.020	0.020	0.008
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.034	0.044	0.044	0.039	0.028	0.028	0.032	0.032	0.049
10 or more	0.028	0.034	0.034	0.007	0.044	0.044	0.032	0.032	0.032

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 5.4
Share of Total Loans Held by Small or Large Banks for Vehicle Loans by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	Probability of Using a Small Bank Only	Less than 10 years	10 years or more	Probability of Using a Small Bank Only	Less than 10 years	10 years or more	Probability of Using a Small Bank Only
Less than 10	0.048	0.063		0.079	0.106		0.040	0.048	
10 or more	0.022	0.025		0.060	0.039		0.015	0.021	
Probability of Using Large Bank									
Less than 10	0.067	0.093		0.044	0.065		0.073	0.103	
10 or more	0.043	0.050		0.032	0.044		0.045	0.051	

All significant differences (significance level = 5%) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 5.5
Share of Total Loans Held by Small or Large Banks for Equipment Loans by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more		Less than 10 years	10 years or more		Less than 10 years	10 years or more	
Less than 10	0.031	0.026		0.058	0.070		0.023	0.010	
10 or more	0.031	0.038		0.065	0.112		0.025	0.022	
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.039	0.024		0.029	0.030		0.042	0.022	
10 or more	0.046	0.080		0.021	0.063		0.051	0.084	

All significant differences (significance level = 5 %) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 5.6
Share of Total Loans Held by Small or Large Banks for Other Loans by Number of Employees and Age of the Firm

Number of Employees	All Firms			Rural Firms			Urban Firms		
	Age of the Firm			Age of the Firm			Age of the Firm		
	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more	Less than 10 years	10 years or more	10 years or more
Less than 10	0.024	0.040	0.080	0.055	0.080	0.015	0.015	0.026	
10 or more	0.035	0.033	0.082	0.005	0.082	0.041	0.041	0.022	
Probability of Using a Small Bank Only									
Probability of Using Large Bank									
Less than 10	0.038	0.019	0.046	0.046	0.017	0.035	0.035	0.020	
10 or more	0.021	0.031	0.038	0.010	0.038	0.023	0.023	0.029	

All significant differences (significance level = 5 %) between the youngest (<10 years old), smallest firms (<10 employees) are denoted in bold-faced type.

TABLE 6

Determinants of Borrowing from a Small, Small/Large and Large Commercial Bank

Dependent Variable: Dichotomous, each size of bank Logistic regression analysis				
Characteristic	Small Bank Only		Large Bank Only	
	Estimate	p-value	Estimate	p-value
Intercept (constant)	-0.9217	0.0053	-1.8166	0.0001
<i>Variables of Interest</i>				
Number of Employees	-0.0074	0.0066	0.0065	0.0043
Firm Quality (Altman Z)	-0.0160	0.5158	-0.0187	0.4028
Firm Age	-0.0068	0.1972	0.0095	0.0329
<i>Control Variables</i>				
Sole Proprietorship	0.2108	0.1520	-0.3062	0.0189
Partnership	0.4538	0.0265	-0.1234	0.5139
Sub-chapter S Corporation	0.1923	0.1815	-0.1275	0.3182
Mining	2.1187	0.0019	-1.5132	0.0383
Construction	0.2119	0.1950	-0.0965	0.5201
Manufacturing	-0.0875	0.6638	0.1069	0.5521
Transportation	0.0899	0.7612	0.1970	0.4584
Wholesale	0.2466	0.1979	-0.1450	0.4154
Retail	0.0288	0.8450	0.0821	0.5333
FIRE	-0.3700	0.1059	0.3445	0.0813
Urban location	-1.1789	0.0001	0.9159	0.0001
Northeast region	-0.4393	0.0148	0.2276	0.1105
Northcentral region	0.9074	0.0001	-0.5041	0.0003
Southern region	0.4203	0.0041	-0.0507	0.6960
Minority-owned	-0.5783	0.0036	-0.0037	0.9814
Woman-owned	-0.0480	0.7218	-0.0917	0.4459
Log total loan amount	0.0235	0.1704	-0.0107	0.4750
Owner Loan	0.0770	0.5847	0.0611	0.6313
Personal Credit Cards	-0.0296	0.7862	-0.0028	0.9771
Business Credit Cards	-0.1199	0.2883	0.2916	0.0039
Credit Union	-1.4591	0.0001	-1.0494	0.0001
Finance Company	-0.8399	0.0001	-1.1135	0.0001
Thrift	-1.8724	0.0001	-1.9096	0.0001
Family Borrower	-1.1612	0.0001	-1.2087	0.0001
Government Borrower	-0.3938	0.4205	-0.9354	0.0474
Lease	0.0258	0.8684	-0.2018	0.1471
Line of Credit Loan	0.8956	0.0001	1.2693	0.0001
Mortgage Loan	0.3335	0.0472	1.1253	0.0001
Vehicle Loan	0.3105	0.0097	0.9264	0.0001
Equipment Loan	0.2889	0.0218	0.3961	0.0008
Other Loan	0.8055	0.0001	0.7266	0.0001
- 2 Log Likelihood		2,819		3,235

TABLE 6.1
Logistic Regression Summary for All Loan Types

Dependent Variable: Dichotomous (borrow from small, small/large or large bank), each size of bank, each type of loan Logistic regression analysis												
Characteristic	Line of Credit			Lease			Mortgage					
	Small	Large	p-value	Small	Large	p-value	Small	Large	p-value	Large	p-value	
Intercept (constant)	-12.011	0.040	-11.964	0.025	-25.466	0.779	-19.657	0.662	-17.116	0.713	-18.795	0.883
<i>Variables of Interest</i>												
Number of Employees	-0.009	0.006	0.007	0.008	-0.032	0.099	0.000	0.956	-0.004	0.566	0.005	0.388
Firm Quality (Altman Z)	-0.011	0.763	-0.023	0.502	0.014	0.934	-0.048	0.606	0.114	0.198	0.002	0.977
Firm Age	-0.009	0.216	0.019	0.008	-0.073	0.061	0.017	0.247	-0.025	0.217	-0.011	0.530
-2 Log Likelihood	2056			2463	215			436	827			912
<i>Variables of Interest</i>												
<i>Vehicle</i>												
Characteristic	Vehicle			Equipment			Other					
	Small	Large	p-value	Small	Large	p-value	Small	Large	p-value	Large	p-value	
Intercept (constant)	-13.184	0.047	-15.669	0.360	-13.830	0.034	-17.409	0.386	-13.109	0.055	-15.279	0.002
<i>Variables of Interest</i>												
Number of Employees	-0.007	0.232	0.001	0.709	-0.013	0.041	0.005	0.216	-0.009	0.231	0.000	0.935
Firm Quality (Altman Z)	-0.074	0.090	0.032	0.401	0.030	0.596	0.032	0.538	0.012	0.869	0.063	0.412
Firm Age	-0.010	0.309	0.007	0.382	-0.013	0.284	0.005	0.618	0.007	0.583	0.004	0.715
-2 Log Likelihood	1471			1859	1155			1159	912			784

TABLE 7

Determinants of the Share of Total Loans Held in Small and Large Commercial Banks

Dependent Variable: Shares, each size of bank Ordinary least squares				
Characteristic	Small Bank Only		Large Bank Only	
	Estimate	p-value	Estimate	p-value
Intercept (constant)	0.1939	0.0001	-0.062945	0.1849
<i>Variables of Interest</i>				
Number of Employees	-0.0011	0.0001	0.0006	0.0572
Firm Quality (Altman Z)	0.0028	0.3866	-0.0002	0.9439
Firm Age	-0.0005	0.4301	0.0010	0.1443
<i>Control Variables</i>				
Sole Proprietorship	0.0361	0.0560	-0.0299	0.1450
Partnership	0.0673	0.0147	-0.0184	0.5392
Sub-chapter S Corporation	0.0321	0.0863	-0.0426	0.0367
Mining	0.2844	0.0006	-0.1894	0.0350
Construction	0.0024	0.9099	-0.0074	0.7543
Manufacturing	-0.0365	0.1550	0.0382	0.1715
Transportation	-0.0099	0.7978	0.0420	0.3161
Wholesale	0.0224	0.3887	0.0107	0.7050
Retail	-0.0142	0.4564	0.0191	0.3551
FIRE	-0.0761	0.0087	0.0540	0.0868
Urban location	-0.2073	0.0001	0.1200	0.0001
Northeast region	-0.0152	0.4594	0.0509	0.0230
Northcentral region	0.1326	0.0001	-0.0435	0.0437
Southern region	0.0615	0.0011	0.0112	0.5851
Minority-owned	-0.0500	0.0260	-0.0013	0.9591
Woman-owned	-0.0011	0.9500	0.0005	0.9788
Log total loan amount	0.0181	0.0001	0.0271	0.0001
Owner Loan	0.0083	0.6581	0.0400	0.0488
Personal Credit Cards	-0.0160	0.2561	0.0006	0.9671
Business Credit Cards	-0.0298	0.0424	0.0421	0.0085
Credit Union	-0.2110	0.0001	-0.2439	0.0001
Finance Company	-0.1684	0.0001	-0.2638	0.0001
Thrift	-0.2067	0.0001	-0.3546	0.0001
Family Borrower	-0.2422	0.0001	-0.2606	0.0001
Government Borrower	-0.2137	0.0009	-0.2534	0.0003
Lease	-0.0560	0.0046	-0.1275	0.0001
Line of Credit Loan	0.0686	0.0001	0.1148	0.0001
Mortgage Loan	0.0279	0.2136	0.0922	0.0002
Vehicle Loan	0.0224	0.1563	0.0909	0.0001
Equipment Loan	0.0168	0.3147	0.0085	0.6413
Other Loan	0.0974	0.0001	0.0556	0.0152
Adjusted R-Square		22		22

TABLE 7.1
Ordinary Least Squares Regression Summary for All Loan Types

Characteristic		Line of Credit			Lease			Mortgage					
		Small	Large	p-value	Small	Large	p-value	Small	Large	p-value			
Dependent Variable: Truncated (0,1) Ordinary Least Squares		-0.018	0.490	-0.118	0.000	-0.002	0.689	-0.005	0.628	0.013	0.419	0.022	0.204
<i>Variables of Interest</i>													
Number of Employees		-0.001	0.000	0.000	0.009	0.000	0.829	0.000	0.154	0.000	0.868	0.000	0.941
Firm Quality (Altman Z)		0.001	0.515	0.000	0.956	0.000	0.301	0.000	0.645	0.001	0.300	-0.002	0.143
Firm Age		-0.001	0.172	0.000	0.492	0.000	0.306	0.000	0.140	0.000	0.842	0.000	0.469
Adjusted R-Squares		21		31		3		7		25		34	
<i>Variables of Interest</i>													
Number of Employees		0.000	0.779	0.000	0.343	0.000	0.132	0.000	0.258	0.000	0.425	0.000	0.683
Firm Quality (Altman Z)		-0.002	0.148	0.002	0.315	0.001	0.491	0.000	0.932	0.001	0.286	0.000	0.887
Firm Age		0.000	0.795	0.001	0.014	0.000	0.520	0.000	0.609	0.000	0.831	0.000	0.759
Adjusted R-Squares		17		23		16		18		26		23	

Notes

- ¹ The lender size information used in this study is proprietary information held by the Federal Reserve Board; hence, the statistical analysis employed for this study was implemented by analysts within the Federal Reserve System.

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BANK CONSOLIDATION AND SMALL BUSINESS LENDING: A SMALL FIRM PERSPECTIVE

Jonathan A. Scott
Temple University

William C. Dunkelberg
Temple University

A major concern of policymakers regarding bank market deregulation is that the consolidation of the banking industry might lead to a reduction in credit availability and/or an increase in the cost of credit to some parts of the business and consumer community. This study examines the experience of 3600 small firms in their most recent attempt to locate financing for their businesses. About 25 percent of the firms experienced a merger or acquisition of their major bank. The impact of that merger on credit availability and the terms of the banking relationship were examined for applicants at commercial banks. Merger activity had no meaningful impact on credit availability or credit costs. It did appear to increase the incidence of related fees for services that raised the frequency of loan search among firms whose major bank was merged. But, overall, the impact of merger activity was benign, with some weak evidence that competition actually increased for the business of these smaller enterprises.

Introduction

Since 1990, the number of insured commercial banks has fallen by over 3,000 as a result of merger, acquisition or failure¹. The causes of this consolidation have been well documented (for example, see Berger, Demsetz, and Strahan, 1998) and substantial literature examining the consequences for small firms has evolved as well. Of particular interest is the effect of consolidation on *small firm* access to capital and the cost of that capital. Small firms play an important role as the engine of innovation and job growth in the economy and are heavily dependent on bank financing for external capital (Cole et al., 1996; Berger and Udell, 1998; Dennis, Dunkelberg and Van Hulle, 1988). Thus, any reduction in availability of credit as a result of banking consolidation could potentially have serious macroeconomic implications.

The potential impact of consolidation on small business access to credit has been analyzed from a bank balance sheet perspective, i.e., the change in the proportion of *small loans* that has resulted from a merger or acquisition. The use of small sized loans (under \$1 million in size) as a proxy for small borrowers may cause some imprecision in the analyses since this loan amount is a multiple of the median sales of a small firm, raising the possibility that many larger firms are included in the analysis. The conclusions of this research have been mixed and depend upon the size of the acquired and acquiring organization, organizational structure and response of other lenders in the market. A number of studies (Berger et al., 1995; Berger and Udell, 1996; Keeton, 1995; Peek and Rosengren, 1996; and Strahan and Weston, 1996) all find that large banks hold a proportionally smaller share of small loans (\$1 million or less) than small banking organizations. Organizational complexity, i.e., holding company structure, appears to have no persistent effect on the share of assets held as small loans. More recent studies attempt to gauge the effect of mergers and acquisitions by examining the pre- and post-merger asset allocation to small loans (Peek and Rosengren, 1998; Strahan and Weston, 1998). A common finding in these papers is that mergers between small banking institutions appear to increase the share of assets held as small loans, but there is no clear, predictable outcome when two large banks or a large and a small bank merge. Perhaps the most comprehensive evidence is provided by Berger et al., (1998), who conclude that adjustments of other banks in the local market offset most if not all of the impact of the merged bank's portfolio reduction in small sized loans.

This paper analyzes the impact of consolidation on small firm access to capital and the cost of capital using the 1995 Credit, Banks and Small Business survey conducted by the National Federation of Independent Business. This database consists of small firms for which employment, sales and borrowing experience are known. Thus, the unit of analysis is the firm and not the loan. The data set provides an assessment of how consolidation has affected the quantity of credit available, the price of credit and the pricing of other bank services. In the 1995 survey, the fifth since 1980, a new question was added to address bank consolidation: "During the last 3 years, was your principal financial institution bought out or absorbed by another?" with a follow-up question regarding how the change affected the firm if they answered "yes." Twenty five percent of the respondents report a merger or acquisition. With these responses, the recent experience of small firms with banking consolidation is related to questions about perceived and actual quantity of credit, loan search activity, loan contract terms, and the price of other banking services.

The unique contribution of this research is the ability to make adjustments for firm-level risk factors, banking relationships and market structure characteristics (e.g., location and bank size) when estimating the effect of consolidation on credit availability, loan search activity, terms of lending and cost of bank services. The actual size of the firm as well as the loan amount is known in our analysis, an advantage over work based on bank balance sheets only. Consolidation of the firm's major bank was not significantly related to owner perceptions of how well borrowing needs were met but was positively related to success in obtaining a loan (but the coefficient was very small). This means that consolidation did not restrict credit availability and indeed may have enhanced it. The decision to shop for another financial institution is strongly associated with merger activity but the number of searches for a loan is not. This result means that firms undertook the same level of search intensity for a new loan regardless of whether or not their major bank was merged. Firms located in smaller markets are more likely to report all borrowing needs met (and have credit extended as well) and search fewer places for a loan regardless of the level of merger activity. For all measures of credit availability and search, the strength of banking relationships is strongly related, both statistically and economically, to favorable borrowing outcomes, even after adjusting for the effect of consolidation.

Consolidation has a mixed effect on loan terms. No significant effect is detected for loan rates (as measured by the spread over the prime rate and the average load rate) and loan-to-value ratios. Consolidation is associated with a higher probability of collateral delivery but the effect was not statistically significant. An increase in the probability that other financial services are required as a condition of the loan, however, is significantly related to consolidation. If fees for these services are higher, then the cost of the loan is increased. Consolidation is also positively associated with an increased incidence of fees. Both the absolute number and the per unit charges were reported more frequently among firms whose bank was merged. These higher fees occurred without a corresponding increase in value received and thus represented new real net revenue to the bank. Firms located in smaller markets pay lower rates, are more likely to have higher loan-to-value ratios, and are less likely to be required to do other business with the bank. Firms doing business at larger banks pay lower rates and are less likely to deliver collateral, but are more likely to have a lower loan-to-value ratio. As was the case with search and credit availability, the strength of banking relationships is significantly associated with more favorable loan contract terms, independent of merger status, market and bank size. Thus, the information content of a banking relationship appears to favorably impact small firms' access to credit and the cost of that credit.

Consolidation can result in adjustment on many margins and credit availability is just one. Our results show that merger events had no ultimate impact on the probability of success in the most recent loan attempt.² Consolidation has a mixed effect on loan terms but does seem to produce higher fees on other bank services. This explains the higher frequency of shopping for a new bank among firms experiencing a merger, even though the merger did not impair credit availability. Although some transactions costs, especially fees, may have increased with mergers and some loan terms may have become more onerous, after adjusting for risk it appears that at least through early 1995, the impact of merger activity on the ability of small firms to expand and create employment opportunities has been negligible.

Bank Consolidation and Small Firm Access to Credit

An assessment of the impact of bank size on capital markets for small firms should begin with the role of banks as monitors of informationally opaque firms (Diamond, 1984). In simple terms, it is harder to monitor and get consistent information from smaller firms. Firms that develop a good credit history are charged lower rates of interest in future periods and create the valuable asset of reputation, that, once sufficiently large, may allow the firm to finance itself directly (Diamond, 1989). Reputation involves more than just a track record of repayment. Certain knowledge about (small) firm customers resides with the specific account manager that cannot be summarized by financial statement analysis, loan repayment history, or the firm's use of other banking products. Part of the value added attributable to account managers is their assessment of non-financial aspects of the firm's operations and management when making the lending decision, such as an assessment of the borrower's ability to deal with a crisis or respond to changing market conditions. Thus, the notion of information opacity has more to do with the lack of standardized financial information, the acquisition of costly (from a direct investment perspective) information about management depth, and management experience with operating risk rather than the complexity of the small business customer itself.

The most frequently cited theoretical basis for expecting changes in small business lending activity as a result of mergers is the differences in organizational architecture at large banks and diseconomies in the cost of collecting information that may be a function of bank size. Large institutions have higher coordination costs that generally result in more standardized credit policies to ensure that remote lending decisions are consistent with the firm's overall goals. Such standardization works well for informationally transparent borrowers where the transparency arises either through external market

measures of firm quality or through firm-specific risk characteristics that are easily captured through standardized measures of credit quality such as credit scoring models. The costs of screening and monitoring smaller firms that are more informationally opaque may create diseconomies within larger financial institutions. These diseconomies arise when the required information for credit extension falls outside the standard parameters necessary to achieve decreasing unit costs from investments in information technology that assist the underwriting process. Thus, the bottom line is that larger banks, with different investment strategies and more complex management structures, find small firm lending too costly to undertake with their standard ratio-driven approach to lending. This leaves the smaller firm loan market to small more entrepreneurial lenders.

The impact of bank size and organizational complexity on small firm lending cannot, however, be evaluated independent of the business strategy. A review of many of the largest banking organizations' annual reports over the past few years would reveal a consistent commitment to mid-market lending as a critical part of their business strategy. While the motivations for a focus on the mid-market may vary, most observers of the banking market concur that increasing competition in wholesale capital market activities is driving down profit margins and that the mid-market is one of the few alternative sources of potential economic profit. The fact that investment banks are turning more to mezzanine lending certainly provides anecdotal support to this view. It does appear that new technologies, better information and a more diverse capital market driven by financial innovation (such as securitization) better explain developments in small firm lending markets than just bank scale and organizational complexity. Thus, it is not surprising that the evidence on organizational structure and its impact on small firm lending is mixed because a strategy for mid-market lending can be executed through many different organizational forms. Static analyses of the relationship between banking size and small firm lending has generally shown that the proportion of loans to small firms declines with bank size (Berger, 1996; Keeton, 1995; Peek and Rosengren, 1996; Strahan and Weston, 1996). However, the association between organizational complexity and small firm lending in both static and dynamic analyses has provided less conclusive results (Berger, et al., 1998; DeYoung, Goldberg, and White, 1999; and Keeton, 1995).

Dynamic analyses that investigated the association between commitment to small firm lending before and after mergers have produced mixed results as well. For example, Peek and Rosengren (1998) find that acquirers recast the target bank lending portfolio into their own image, and, because most acquisitions involve two or more small banks, they suggest the concern over acquisitions and lending to small

firms may be overblown. However, in their sample, half of the mergers resulted in post-merger declines in small firm lending (as measured by the percentage of assets held in the form of "small" loans). Strahan and Weston (1998) examine the dynamics of acquisitions and small firm lending at the bank company level. They find that small business lending increases up to \$300 million in holding company size and decreases thereafter. Like Peek and Rosengren, they find that consolidation of small banking firms results in increased bank lending to small firms. Berger et al., (1998) have conducted the most comprehensive study at the market level and, therefore, are able to capture the effect of competitors on total market share of small firm lending. They found that other banks in the market offset the negative effects of consolidation on small firm lending³, a finding confirmed by our own work. Thus, in most markets, there are sufficient competitors to guarantee no sustained reduction in credit availability as banks restructure themselves to take advantage of new technologies and changing markets.

Most of the literature analyzing the relationship between small firm lending and consolidation has focused on the volume of small loans made. This paper's focus is not only on loan volume, but also on other important banking margins potentially affected by consolidation from a completely different perspective—that of the small business borrower. Using the 1995 Credit, Banks and Small Business Survey, the responses of over 3,600 members of the National Federation of Independent Business (NFIB) are used to isolate the effect of recent consolidation on a number of dimensions of the small firm interactions with banks. This analysis is static, i.e., it examines the reported cumulative impact of consolidation at a point in time. Specifically, we relate the firm's reporting of merger status of their primary bank in the last three years to six issues: (1) their assessment of whether all of their borrowing needs were met; (2) their success in obtaining their most recent loan; (3) their decision to shop for another bank for their business; (4) the number of tries (searches) to obtain their most recent loan; (5) various loan contract terms such as the rate (spread over prime), collateral delivery, loan-to-value ratio, the requirement to do other financial business with the lender; and (6) the scope and scale of fees on banking products. We control for the strength of bank relationships on several dimensions as well as firm-specific risk factors such as years in business, total assets and sales growth. Both market size and size of the merged bank are incorporated into the analysis. The data from this survey provide a complementary perspective to the analyses using the National Survey of Small Business Finance (NSSBF) data and thus help further our understanding of how banking consolidation has affected the demand side of the small firm market.

NFIB Data Set

Since 1980, the National Federation of Independent Business has periodically surveyed its membership as part of the Credit, Banks and Small Business survey series. In these surveys, small firms are asked about their access to credit, terms of their most recent loan, their assessment of competition for their financial business, their desired characteristics in a banking relationship, and the performance of their financial institution. The data in this paper come from the 1995 Credit, Banks and Small Business Survey conducted by the National Federation of Independent Business. This survey was the fifth in a series that extends back to 1980. Eighteen thousand surveys were mailed to a sample of the 600,000 membership of the NFIB. After two mailings, 3,642 completed surveys were available. The survey questions addressed four areas: 1) firm demographics (e.g., form of organization, gross sales, and number of employees); 2) financing (e.g., sources, problems with financial institutions, most recent loan request, characteristics of most recent loan); 3) competition (e.g., number of account managers, last time changed financial institution, total number of banks used); and 4) preferences in a financial institution and ranking of performance on those preferences (e.g., knows your business, reliable source of credit, easy access to loan officer). Unlike the National Survey of Small Business Finance, the NFIB Credit, Banks and Small Business Surveys have not asked for detailed balance sheet and profit/loss information, but rather have asked respondents to check categories for asset size and sales growth that best fit their firm.⁴

A description of the sample that includes demographic and financial services information is presented in the Appendix. About one-fourth of the respondents are in construction or manufacturing, another fourth in wholesale and retail trade and another fourth in professional and non-professional services. The median sales are \$400,000 with wholesale firms having the largest median sales and service firms the lowest. The average number of FTE (full-time equivalent) employees is 18 with a median of 7; finance and service firms have the smallest median FTE while manufacturing and wholesale firms have the largest. The median assets size are about \$225,000 with an average (calculated using the mid-points of the asset size distribution) of over \$600,000. These respondents have been in business an average (and median) of 13 years and over half are located in large cities or metropolitan areas with populations in excess of 250,000.⁵

The average loan size reported is \$544,000 but this number is strongly influenced by several very large loans. The median is only \$40,000 and the 90th percentile is \$382,500. Virtually all of the existing research focusing on small firm access to credit uses loan size as a proxy for small firms and the cutoff, based on regulatory reports, is

loans less than \$1 million. While some of these loans may be to “large” firms, there is no way to differentiate other than by this size cutoff. Thus, an advantage of these data is the ability to focus on truly small loans at small firms.

The distribution of responses to the question that is the focus of the paper’s analysis, “During the last three years, was your principal financial institution bought out or absorbed by another?” is presented in Panel B of the Appendix, along with other responses related to financial services. One-fourth of the firms report that their principal financial institution had been bought or absorbed in the three years prior to the survey. Of these, about half reported that the change had not been positive, including 14% that changed banks as a result of the merger or acquisition. Only 6% viewed the change as favorable and 15% were still assessing the overall impact of the merger on their banking relationship. For the entire sample, 88% recently applied for credit and slightly more than 10% (.10/.88) were unsuccessful in obtaining a loan. Commercial banks are and always have been the dominant providers of credit. Over half of the bank borrowers did business at institutions with assets of less than \$1 billion.

Loan Search and Credit Availability: Bivariate Analysis

The impact of consolidation on small firms’ ability to obtain adequate financing can be examined from several perspectives with the NFIB survey questions. The respondents were asked, “Over the last 3 years was your firm able to SATISFY (sic) its borrowing needs at all times?” Over half of the respondents reported that they were able to satisfy their borrowing needs at all times during the past three years, while 19% reported they were not. However, the percent unable to satisfy their borrowing needs rose to 34% for those firms whose primary financial institutions merged in the past three years (Table 1). Small firms that experienced mergers of their principal financial institution were significantly less able to satisfy their borrowing needs at all times. The impact of mergers on the satisfaction of firm borrowing needs, of course, does not translate directly into an unambiguous effect on availability. Instead, qualified small firms may have had to search more to get their credit needs satisfied and thus proceed with operating or expansion plans but at a higher cost.

Each firm reported on the status of its most recent loan search. A summary of the institutions where firms searched for loans, where they finally received a loan, and the success rate for firms engaged in the search process is shown in Table 2. Overall, 12% of the sample did not answer the question (and presumably did not seek a loan) and 10% reported an unsuccessful search. Most attempts to get a loan (a “loan search”) were made at commercial banks (81%). Excluding loan

refusals and non-response, banks also made over 80% of the loans that were granted (64% of the sample reported getting a loan at a bank). All other types of institutions and private investors and loan searches accounted for less than 20% of the loans granted.

Among firms that were successful in obtaining a loan, banks' market share of loans granted appears to have increased since 1987 (the year of the last Credit, Banks and Small Business survey) at the expense of government agencies and private individuals. This shift of funding from private sources to banks most likely resulted from the increased bank focus on the small firm market as a new source of lending opportunities. Thus, widely reported bank efforts to increase small business market share appear to have been successful, even with the consolidation in banking that occurred during the inter-survey period. Despite less frequently being able to satisfy borrowing needs, those firms that experienced consolidation had the same turndown rate, 11% ($= .10 / (1.00 - .12)$), as those firms that did not (Table 2, far right columns). The mean response of successful searches by merger experience in the past three years was not significantly different from those firms that did not experience a merger.

If the firms experiencing a consolidation of their major bank more frequently felt they were unable to satisfy their borrowing needs but were ultimately as successful in obtaining a loan, then we would expect these firms to be more actively engaged in searching for a new financial institution. Table 3 presents the responses to the question, "Within the last three years, did you actively shop for a different financial institution to service your business needs?" These data show that firms experiencing a merger more frequently reported shopping for a new institution (41%) than those that did not (26%) and the mean difference is significant. Despite the greater search activity due to consolidation, it is interesting to note that the overall percentage of firms searching for a new bank has fallen since 1987 (30% vs. 35%) even though significant increase in bank consolidation has occurred since the last survey.

The survey also provides information on the intensity of search activity as measured by the total number of financial institutions the firm approached before it received a loan or stopped trying. Consolidation will produce mismatches between the surviving institutions' portfolio strategy and some of the small business clients of the merged banks. Changes in bank service structure, rotation of account executives and other similar changes will also produce customer dissatisfaction. Seventy-seven percent reported a loan search at one or more financial institutions. Most searchers (75%) approached only one institution for a loan (Table 4). Those searching at more than one institution frequently diversified their searches across institutions (e.g., applying at a bank and a finance company) rather than at two banks. For example,

for those firms contacting three or more institutions, 34% of the institutions contacted were not banks (Table 5). This pattern may reflect uncertainty at the firm regarding the market perception of its risk. To reduce the probability of a refusal (and thus no loan at all), some firms extend their search over a spectrum of financial institutions serving multiple risk classifications. Firms experiencing consolidation more frequently reported a higher number of searches than those that did not. The mean difference, however, was not statistically significant and, thus, search intensity does not appear to be significantly affected by the merger status of the small firms' primary bank. The overall results support the proposition that consolidation may have increased search costs a little, but it has not systematically affected credit availability.

The t-tests presented in the tables are suggestive of a persistent relationship between consolidation and small firm search costs for credit. However, these tests do not control for firm risk characteristics (operating and financial) or market structure. For example, the increased search activity could be attributable to a higher proportion of riskier firms that also happen to be customers of banks that merged. If the mergers reported in this survey involved primarily larger banks taking over smaller banks, then we might expect that customers of small banks to be more adversely affected than those of large banks (see Peek and Rosenberg, 1998). Or, it could be the case that mergers have diminished the strength of banking relationships thus reducing credit availability (see Cole, 1998). Thus, the relationships examined above are subjected to more rigorous multivariate analysis to better isolate the effect of consolidation on credit availability and search activity.

Loan Search and Credit Availability: Multivariate Analysis

Three sets of exogenous variables were used in the multivariate analysis: firm risk variables, bank and market structure variables, and proxies for strength of banking relationships. The firm risk variables include years in business, one digit SIC industry classification, total assets, sales, sales growth during the past three years, market size (in terms of population) and the asset size of the respondent's current bank. The strength of banking relationships is represented by three survey variables: the length of time with the primary lender, the number of times of different account managers in the past 3 years, and whether personal banking is done at the firm's principal bank.⁶ A full description of the independent variables, including merger status, is shown in Table 6.

The sample for analyzing the fulfillment of borrowing needs, bank search and number of bank searches is restricted to include only those respondents who obtained a loan in their most recent search attempt. The reason for this restriction is to focus on how consolidation has

affected qualified firms that would presumably be most hurt if consolidation affected the availability and cost of banking services. The credit extension equation includes all firms that applied for a loan in the last three years at a commercial bank and thus includes those that were turned down. Probit analysis is used to estimate the marginal probabilities that the respondent reported that all of its borrowing needs were met, that it had actively shopped for a new bank in the past year and whether credit was extended in the most recent application. Tobit analysis is used to analyze the number of searches because the dependent variable was censored between 0 and 7 (the maximum number of searches reported). These results are presented in Table 7-A.

The multivariate results confirm the findings from the bivariate analysis. Mergers lower the likelihood that borrowing needs are met and increase the probability that firms will shop elsewhere for credit services. The finding that mergers are significantly related to the decision to shop for another bank but not significant for reports that all their borrowing needs were met are in fact consistent. Small firms were voting with their "feet" in response to deterioration of service delivery or unhappiness with loan terms or prices of the bank services as a result of the merger.⁷ As shown in Table 3, firms whose major bank merged were much more likely to look for a new bank for loan services (a "search"). But it appears that firms "searching" at their own institution were about as successful as those searching at a new institution. Thus the number of searches was not related to merger activity, but where the search was made was affected by whether or not the major bank had merged.⁸ Interestingly, the probability that credit is obtained on the most recent loan search is higher if the firm's bank merged, although the increase in the probability is only 0.04 (but is significant). Thus, firms whose major bank was merged search as often for a new loan as firms whose banks were not merged. But they search at other institutions where they are at least as welcome as they were at their old banks, if not more so, producing slightly higher success rates in the loan search process for firms whose banks had merged. This result suggests that the markets are quite competitive and that banks in a market aggressively pursue the customers of merged banks.

Banking relationships are important in explaining search and availability, independent of merger activity. Stronger relationships (longer time with the primary lender or less account manager turnover) resulted in a higher probability that all borrowing needs were met, less search activity, and a higher probability of success on the most recent loan attempt. For example, moving from the lowest value of account manager turnover ("1") to the highest ("5"), decreases the probability of all borrowing needs met by .28, increases the chance that the firm searches for a new bank by .46, increases the number of searches by .45, and reduces the probability of credit extended by .19.⁹

The positive association between stronger relationships and success in obtaining a loan corroborates recent findings by Cole (1998) using the NSSBF data, although Cole (1998) only finds “zero” length of relationship significant and does not have a proxy for account manager turnover. These results suggest that loan officer turnover is more “damaging” to credit terms and availability than the merger event.

The association between a merger event and credit availability and loan search may be biased due to the high correlation between the banking relationship variables and the merger event. A small firm that is a customer of an acquired bank will have a shorter relationship and most likely a new account manager.¹⁰ To control for this potential source of bias, interactive categorical variables are constructed. Two categorical variables for the merger question are constructed, one for ‘Yes’ responses and the other for ‘No’ responses, and then each is multiplied by the associated value for account manager turnover and length of relationship. Wald tests are then made of the hypothesis that the coefficient on the “merger” and “no merger” relationship variables are identical. The results of this analysis, presented in the bottom panel of Table 7-A, show that the assumption of identical length of relationship and account manager turnover effects couldn’t be rejected for all of the equations. Thus, the significance of the impact of mergers is independent of the strength of banking relationships.

Market and bank sizes have a mixed effect in explaining variation in credit availability and loan search activity. Firms located in smaller markets have a higher chance of having their borrowing needs met and a higher chance of credit being extended.¹¹ This result is consistent with Petersen and Rajan’s (1994) hypothesis about market competitiveness and credit rationing where less competitive markets allow banks to lend more to small firms because they can maintain higher rates over time than they would be able to in a more competitive market. Firms in small markets have fewer search tries for a loan, a result that is consistent with lower density of financial institutions in smaller markets and thus fewer places to search. Bank size shows no relationship to search activity but an adverse impact on credit availability, although it is not statistically significant.

To gain a better insight into the market and bank size relationships with small firm loan search and credit availability, the sample was stratified by bank size (Table 7-B). This stratification is made because of prior research that has documented differences in commitment to small firm lending by bank size. Several interesting results are obtained from the stratification. The impact of mergers on the decision to shop for a new bank is driven by the respondents with medium or large banks, not small banks. Also, the apparent increase in credit availability in the presence of mergers is attributable to firms with large banks as their primary financial institution. Thus, although

customers of large banks have a lower probability of credit being extended, the odds improve if their bank recently merged. The impact of market size also varies by the size of the small firm's bank. Small firms that are customers of large banks serving small markets report better experience in both having all borrowing needs met and success in their most recent loan attempt. The effect of market size on the number of searches is not present in the stratified sample, apparently caused by the strong correlation with bank size.

Overall, consolidation appears to have not adversely affected the ability of small firms to satisfy their borrowing needs. In fact, mergers appear to have increased the chance of the small firm's success in their most recent loan attempt. Stronger bank relationships, as represented by the length of the relationship and account manager turnover, are much more important than mergers in affecting credit availability. Nor has consolidation adversely affected the number of searches after controlling for bank relationships and firm risk factors. Firms in small markets are more likely to have credit needs met and searched less to obtain their loan. Bank size has a weak effect on credit availability. Firms that experienced mergers were much more likely to have shopped for a new bank during the past three years. Although obtaining credit is the "bottom line," the higher probability of shopping for a new bank by "merged" small firms may be due to dissatisfaction with the cost of other banking services or loan contract terms.

Consolidation and Pricing of Bank Services

Bank Fees

The Survey asked respondents to comment on changes in the number of services on which they pay fees as well as the fees per unit of service. These responses are reported in Table 8 and are broken down by merger status. Only 4% report that the number of services with a fee has declined (Table 8). Forty-one percent report that the number of services for which fees are charged has increased and 46% report that the "per unit" costs of services has increased. Only 2% of the owners feel that there has been an improvement in service quality or variety that would justify the observed increases in service fees; 42% are firmly convinced that this has not happened and that costs are definitely up. By bank size, it is clear that the larger banks have been relatively more active in raising fees than smaller banks and are more frequently perceived as delivering less value per dollar charged for their services (Table 9).

The incidence of fees and reports of increased cost per unit show a strong relationship to merger experience. Firms experiencing

consolidation more frequently report both substantial decreases *and* increases in the number of services requiring fees. Fees per unit showed the same pattern: firms that experienced a merger more frequently reported decreases (“decreased slightly” or “decreased substantially”) and increases (“increased slightly” and “increased substantially”). Excluding the “Don’t Know” and “No Answer” responses, the mean response by merger status is computed for each question and these differences are significant. The firms that reported increases in fees and experienced mergers also believed they received less value for the increase than those firms that did not experience mergers.

As was the case with credit availability and loan search, the bivariate relationship between fees and merger status may be driven by firm risk factors, banking relationships, or market and bank structure. A censored regression analysis is used on both of the fee variables where the dependent variable takes on a value of ‘1’ for “decreased substantially” up to a value of ‘5’ for “increased substantially.” The sample includes: 1) only those firms that report searching for a loan at a commercial bank in the past three years; and 2) those that report the additional cost did not reflect a comparable increase in service. The same set of control variables are used to capture firm risk, banking relationship, market and bank structure effects on the fee decision. Stronger banking relationships are expected to result in lower fees (both number and per unit cost) if the volume of the customer’s business is profitable.

The results presented in Table 10-A show that mergers are associated with an increase in both the number of fees and fees per unit of service, even after controlling for risk and banking relationships. The strength of banking relationships has a mixed effect with the expected effect for account manager turnover (less turnover, the smaller an increase in the number of fees or fees per unit of service). However, longer relationships are positively associated with *both* a higher number of fees and fees per unit of service. The introduction of the interactive merger/relationship variables provides some insight into this unexpected result. Higher account manager turnover results in more fee increases, regardless of merger status and the null hypothesis of equivalent effect cannot be rejected. However, longer relationships result in more fee increases only when the merger has been experienced. While statistically significant, the null hypothesis of equal effects can only be rejected for the fees per unit of service equation.

Market size is not significantly related to the frequency of reported fee increases although bank size appears to have a positive relationship. Firms with a large bank as the primary institution have a higher probability of reporting higher fees per unit of service. When the sample is stratified by bank size (Table 10-B), the effect of bank size is clearer: small firms that were customers of banks with assets between \$100 million and \$1 billion have a higher probability of

reporting increases in fees per unit of service if their primary institution recently merged. Mergers increased the probability that fees were imposed on (previously free) services, but for the largest banks, the fees per unit of service did not increase, perhaps a reflection of the degree of competition in large bank markets.

Loan Terms

Consolidation clearly affects loan terms reported, with a more pronounced effect on non-interest rate terms (see Table 11). Small firms that experienced mergers paid a lower average rate although the mean difference is not significant¹². Collateral delivery is more frequently required of firms by merged banks (71% versus 64% for firms not reporting mergers) and this difference is significant. A loan-to-value (LTV) ratio is calculated for those firms reporting both a loan amount and the market value of collateral required. Firms reporting a merger have a lower mean LTV than those that did not, but the difference is not significant.¹³ Customers of merged banks are more frequently required to move their other financial business as a condition of the loan with 36% required from merged institutions versus 25% from non-merged ones.

Multivariate analyses are again used to control for the effect of firm risk, strength of bank relationship measures, and market/bank size to better test the tentative conclusions drawn from the data in Table 11. Censored Tobit regression is used for the interest rate and LTV equations. The LTV sample is further restricted to exclude increases in existing lines of credit where sufficient existing collateral value may be in place and no additional amount (or a very small amount is reported). Even with these exclusions, some of the LTV ratios are extremely high, which has the potential to create very inefficient estimates. To better isolate the effect of mergers, we exclude all of the firms reporting LTV values greater than 1.0 (approximately 8%). To account for the potential variation in the level of base lending rates for the reported loan rates, a set of dummy variables (not shown) assigned for the quarter the loan was made is included in the interest rate equation. Probit analysis is used for the collateral delivery and other financial services equations. The multivariate results are presented in Table 12-A.

Consolidation is associated with lower interest rates paid on loans, an increased probability of collateral delivery, higher LTV ratios and an increased probability of the requirement to do other business with the bank as a condition of the loan. However, only the collateral delivery and other business requirement effects are statistically significant with a merger increasing the probability of both by 0.06. These results are consistent with the bivariate analysis in Table 11, namely, that the effect of mergers on loan contract terms is mixed.

Banking relationships play an important role in the setting of loan contract terms. The signs of the coefficients are all consistent with the expected effect: stronger relationships result in more favorable loan contract terms, although the statistical significance varies. Longer banking relationships are significantly related to lower interest rates, and a lower probability of collateral delivery and the requirement that other firm banking business be moved to the lending bank. Higher manager turnover is significantly related to lower LTV ratios and a lower probability of other bank business being required. Moving from the longest length of relationship category to the shortest increases the loan rate by 19 basis points, the probability of collateral delivery by 0.06, and the probability of other business required by 0.12. Likewise, moving from the shortest to the longest account manager turnover category increases the LTV ratio by 0.16 and the probability of other business required by 0.18. The impact of relationships is independent of the merger event for loan rate, LTV ratio and other business banking requirements (see bottom panel, Table 12-A). For collateral delivery, however, the merger effect is strongly related to the length of the banking relationship: longer relationships resulted in a lower probability of collateral delivery only for those firms that did not merge.

Market size appears to have no significant effect on loan contract terms but bank size does, although the effect is again mixed. Small firms doing business at larger banks have lower rates, a lower probability of collateral delivery, a lower LTV ratio and a higher probability of other business banking requirements as a condition of the loan. These associations are all significant except for the other banking business requirement. A small firm that does its banking at a bank with assets in excess of \$1 billion, on average, pays 23 basis points less on their most recent loan rate, has a 0.07 lower probability of collateral requirements, and a 0.06 lower LTV ratio.

The stratification of the sample (Table 12-B) again provides some insights into the source of the merger effects identified in Table 12-A. Firms doing business with small banks appear to be driving the relationship between mergers and lower rates because the merger event has its strongest effect on these firms. The positive association between mergers and collateral delivery, on the other hand, appears to be caused by the small firms that do their business with very large banks where the probability of collateral delivery is the highest. There appears to be no differential effect of mergers by bank size. The positive association between mergers and other business requirements as a condition of the loan appears to be driven by firms that do their banking with small banks. The bivariate results suggest that small firms were far more likely to be required to move their other banking business to the lending bank if its assets were \$100 million or less (a "small"

bank). This relationship is supported by the regression results, but the coefficients are not statistically significant.

Conclusions

The effects of consolidation within the banking industry are difficult to identify and estimate since firms and banks can respond to changing market circumstances on many margins. Using the question, "During the last 3 years, was your principal financial institution bought out or absorbed by another?", the impact of consolidation on small business perceptions of credit availability, loan search and the cost of banking services (both loan terms and fees) were analyzed. For the 25% of the sample that experienced bank consolidation, the findings were mixed. On the downside, these firms more frequently reported: (1) an inability to satisfy their borrowing needs; (2) shopping for a new bank; (3) searching more institutions for their most recent loan; (4) paying more fees as well as higher per unit fees; (5) collateral delivery; and (6) more frequent requirements to do other banking business with the lending bank as a condition of the loan. On the upside, these firms more frequently report lower interest rates, higher loan-to-value ratios, and a higher success rate in obtaining their most recent loan.

The above conclusions based on bivariate comparisons do not control for other factors that might explain the observed associations such as differences in risk, market structure or banking relationships. Although small firms that experienced recent bank mergers more frequently reported an inability to satisfy their borrowing needs, the multivariate analysis suggests otherwise. Consolidation has had no significant adverse effect on small firm's ability to satisfy all borrowing needs, although the coefficient on the merger variable is negative. Even so, the effect of mergers on the probability of obtaining the most recent loan is favorable, supporting the bivariate relationships. However, the decision to shop for a new bank was clearly more frequent for firms whose major bank merged or was absorbed. Search costs, as reflected in the number of banks contacted before a loan was received or the search terminated, show no significant association with merger activity even though it did in the bivariate analysis.

The association of mergers with a higher number of fees and fees per unit of service remains in the multivariate analysis, as does the higher incidence of collateral delivery and other business required as a condition of the loan. Neither the interest rate paid nor the loan-to-value ratio is significantly associated with merger status. On balance, it appears that small firms that experienced a merger of their major bank experienced no reduction in credit availability in the credit market and were able to get financing at about the same price as those whose major bank was not merged. The higher fees and more adverse

non-price loan terms produced by mergers do appear to be motivating the more frequent shopping for a new bank after the merger occurred.

Another important result from the analysis is to show the importance of the strength of banking relationships on credit availability, loan search, and loan contract terms independent of consolidation. Longer relationships and less frequent turnover are significantly associated with greater credit availability, fewer searches to obtain a loan, less frequent shopping for a new bank, and a lower probability of other business required as a condition of the loan. Longer relationships are significantly associated with lower rates paid and less frequent collateral delivery while less frequent turnover is significantly associated with higher loan-to-value ratios.

Market and bank size effects are mixed. Firms in smaller markets appear to have more success in getting their credit needs met but don't incur differential loan contract terms. While bank size has no significant effect on credit availability and search, a stratification of the data by bank size reveals that small firms doing business with a large banking organization are more likely to have borrowing needs met if they are located in a small market. Small firms that are customers of large banks are also the ones more likely to have been successful on their last loan search and paying higher fees as compared to customers of small banks. For large bank customers, mergers have resulted in a higher incidence of collateral and other financial services required as a condition of the loan.

These results, while statistically and economically robust, must be interpreted with caution in the context of the existing literature. First, the data do not allow us to distinguish between mergers and acquisitions. This difference has been shown to be important in explaining the shares of small loan commitments as a share of assets. Moreover, extant research has confirmed a three-year gestation period to achieve "equilibrium" lending shares after a merger. Our sample only asks about consolidation within the past three years and does not specify the date at which the action occurred. Thus, we cannot capture any dynamic effects of consolidation on the margins investigated in this paper. And finally, the relative sizes of the acquiring and acquired bank have been shown to be an important predictor in how the shares of small loans will change after consolidation. We only have the size of the current principal banking organization, not the prior bank.

Overall, our results complement the existing literature by providing one of the first perspectives on mergers from the small firms' point of view. Although consolidation is strongly associated with small firms searching for a new bank (and presumably a new loan), its effect on the most important aspect of the banking relationship—the ability to obtain credit—is negligible. The reconciliation of an improved chance of success in the most recent loan attempt and increased bank

search activity in response to consolidation lies in adjustments on other margins. Higher fees (both in number and per unit cost) and an increased incidence of collateral delivery and the requirement to do other business with the bank as a condition of the loan were strongly associated with consolidation—but higher interest rates or lower loan-to-value ratios were not. If obtaining credit is the “bottom line” affecting the ability of small firms to expand and create employment opportunities, then our results suggest that bank consolidation through early 1995 has not compromised the economic contribution of this sector.

Jonathan A. Scott, associate professor, teaches undergraduate honors finance courses and introductory MBA courses at Temple University. He has been a consultant to the Federal Home Loan Bank of Dallas, the Federal Deposit Insurance Corporation and the Federal Housing Finance Board. He is the author of numerous articles concerning banking and small business. Scott has a B.A. from the University of Cincinnati and an M.S. and a Ph.D. from Purdue University.

William C. Dunkelberg is a professor in the School of Business and Management at Temple University. He is an elected member of the Conference of Business Economists and the National Business Economic Issues Council and a senior fellow at the Foreign Policy Research Institute in Philadelphia. Dunkelberg has a Ph.D. from the University of Michigan

TABLE 1

Borrowing Need Satisfaction and Consolidation

Ability to Satisfy Borrowing Needs	Financial Institution Bought or Absorbed		
	Yes	No	Overall
Yes	51%	57%	55%
No	34%	13%	19%
Did not want to borrow	14%	28%	25%
No answer	2%	2%	2%
Total	100%	100%	100%
Mean response ("Yes" =2; "No"=1)	1.69	1.75	
t-statistic	-2.71		

TABLE 2

Loan Search and Consolidation

Source of Funds	Successful Search		Financial Institution Bought or Absorbed		
	Search	1995*	Yes	No	Total
Bank	81%	83%	67%	64%	64%
Credit union	3%		1%	2%	2%
Finance company	4%	8%	2%	3%	3%
Other financial institution	3%		1%	2%	2%
Friend, relative	4%	6%	4%	4%	4%
Private individual	2%		2%	1%	1%
Other source	3%	3%	3%	3%	2%
[Government agency]	na	na			
Turned down			10%	10%	10%
No answer/did not apply			9%	12%	12%
Total	100%	100%	100%	100%	100%
* Adds to 100% of all institutions searched					
Mean percent succesful in obtaining loan			81.9%	81.1%	
t-statistic			0.45		

TABLE 3

Bank "Shopping" and Consolidation

Shopped for Different Institution	Financial Institution Bought or Absorbed			
	<u>Yes</u>	<u>No</u>	<u>Total</u>	<u>1987</u>
Yes	41%	26%	30%	35%
No	56%	71%	67%	61%
No answer	3%	3%	3%	4%
Total	100%	100%	100%	100%
Mean response ("Yes" = 2; "No" = 1)	1.48	1.3		
t-statistic	7.36			

TABLE 4

Loan Search and Consolidation

Number of Institutions Searched	Financial Institution Bought or Absorbed			
	<u>Total</u>	<u>Searching</u>	<u>Yes</u>	<u>No</u>
One	58%	75%	70%	77%
Two	11%	15%	17%	13%
Three	5%	6%	8%	6%
Four or more	3%	4%	5%	4%
No attempts	11%			
No answer	12%			
Total	100%	100%	100%	100%
Mean response (using actual searches)			1.81	1.64
t-statistic				2.1

TABLE 5

Loan Search Sources

Number of Searches	<u>Bank</u>	<u>Credit Union</u>	<u>Finance Company</u>	<u>Other Fin. Inst.</u>	<u>Friend, Relative</u>	<u>Private Individual</u>	<u>Other</u>
One	90%	1%	3%	2%	1%	0%	2%
Two	74%	6%	5%	6%	4%	2%	3%
Three	66%	4%	10%	6%	6%	4%	4%

Note: Percentages are based on the number of credit sources contacted. For example, of those that contacted three or more sources, 66% of the contacts were at bank, 4% at credit unions, and so on.

TABLE 6

Independent Variable Construction

The sample used in the analysis included all respondents who reported searching for a loan at a commercial bank in the past 3 years (from the survey date) and who were successful in their loan search. 'No Answer' responses for each variable are included in the analysis through the creation of a dummy variable.

Years in business: How long the firm has been in business in years. Mean = 15.5 years

Assets: Nine categories are reported as shown in the Appendix. Entered in ordinal form with "1" assigned to the category 'Under \$50,000' up to "9" assigned to the category of '\$10 million or more.' Mean = 3.7

Sales growth: Five of the six categories are used with "Too New to Measure" excluded and entered as a dummy variable. The five were entered in ordinal form with '1' assigned to "Declined more than 5%" up to '5' assigned to "Grew 20% or more." Mean = 2.8

Sales: Gross sales – net of sales taxes and other excise taxes reported in \$thousand. This variable was entered in log form because of extreme values in the distribution (see Appendix). Mean = \$2,574,000

Account manager turnover: The number of account managers reported in the last 3 years. For '5 or more' this variable is assigned the value "5." Mean = 1.7

Length of relationship: The number of years since the firm changed its principal financial institution. A value of '1' is assigned to the category "Within the last year" up to a value of '6' for the category "More than five years." Mean = 4.8

Merged: A value of '1' is assigned to a "yes" response to the question 'During the last 3 years, was your principal financial institution bought out or absorbed by another?' and a '0' for a "no" response. Mean = .26

Small market: A value of '1' is assigned if the firm is located in a market with a population of less than 250,000 and '0' otherwise. Mean = .47

Large bank: A value of '1' is assigned to respondents whose primary bank has assets of \$1 billion or more and '0' otherwise. Mean = .38

Medium bank: A value of '1' is assigned if assets are between \$100 million and \$1 billion and '0' otherwise. Mean = .29

Industry category: A set of eight dummy variables are created for 1 digit SIC classification but are not reported in the results in Tables 7, 10 and 12.

TABLE 7-A

**Multivariate Results for Effect of Banking Consolidation on
Small Business Loan Search and Credit Availability**

Binomial probit analysis is used for equation (1), (2), and (4); tobit analysis is used for equation (3). The sample for equations (1) - (3) includes all respondents that reported a successful loan search at a bank in the past 3 years; equation (4) includes only those firms that reported a loan search at a commercial bank. The dependent variable in equations (1) and (2) takes the value of "1" if the respondent reported 'yes' and "0" if the respondent reported 'no'. The dependent variable in equation (3) takes on a value between "1" and "7," the maximum number of searches reported. The dependent variable in equation (4) takes on the value of "1" if they were successful in obtaining a loan from a commercial bank and "0" otherwise.

The 'Merged/Absorbed in Last 3 Years' variable is entered as a categorical or dummy variable, taking on a value of "1" if answered yes and "0" otherwise. "No" responses to this question are omitted from the estimation and the coefficient should be interpreted relative to the omitted category. Certain variables were entered with the ordinal value assigned to the category on the survey and are noted with the suffix 'ordinal'. The construction of the independent variables is described in Table 6. Control variables for 1 digit industry SIC were included but not reported. No answer categorical variables were also included where appropriate and are not reported as well.

Asymptotic t statistics are reported next to the coefficients for the probit equations and are compared to critical values of the Student's t distribution.

Variable	(1)		(2)		(3)		(4)	
	All Borrowing Needs Met Coefficient	Coeff./S.E.	Shopped for a New Bank Coefficient	Coeff./S.E.	Number of Searches Coefficient	Coeff./S.E.	Credit Extended Coefficient	Coeff./S.E.
<i>Intercept</i>	0.171	0.65	0.337	1.40	2.216	7.93	(0.309)	(1.29)
<i>Merged/Absorbed in last 3 years</i>	(0.123)	(1.53)	0.288 ***	3.80	0.068	1.10	0.139 *	1.73
<i>Length of relationship</i>	0.107 ***	5.53	(0.311) ***	(16.46)	(0.067) ***	(3.05)	0.031 ***	1.65
<i>Account manager turnover</i>	(0.248)	(6.36)	0.321 ***	8.17	0.109 **	2.45	(0.166)	(5.22)
<i>Small market (rural, small city, city)</i>	0.201 ***	2.65	0.085	1.20	(0.142) *	(1.75)	0.251 ***	3.50
<i>Medium bank (\$0.5 - 1.0 billion in assets)</i>	0.007	0.08	(0.012)	(0.14)	(0.050)	(0.50)	0.087	0.95
<i>Large bank (\$1 billion in assets or more)</i>	(0.121)	(1.30)	0.081	0.71	(0.051)	(0.51)	(0.072)	(0.82)
<i>Log (years in business)</i>	0.080	1.62	(0.050)	(1.09)	(0.067) *	(1.67)	0.172 ***	3.86
<i>Asset size</i>	0.062	2.30	0.030	1.32	0.044	1.70	0.100	4.30
<i>Log (sales)</i>	0.004	0.13	(0.009)	(0.33)	(0.026)	(0.88)	0.053 **	1.99
<i>Sales growth</i>	0.048	1.57	(0.003)	(0.11)	(0.024)	(0.71)	0.067 **	2.30
Number of observations	1725		1832		1865		2,054	
Mean of dependent variable	0.797		0.350		1.676		0.81	
Pearson Chi Square	143		489				166	
Degrees of freedom	29		28				28	
p value	0.00		0.00				0.00	
Interactive Merger/Relationship Variables								
<i>Length of relationship - ordinal</i>								
<i>Merged</i>	0.123 ***	4.75	(0.260) ***	(10.38)	(0.044)	(1.55)	0.069 **	2.69
<i>Did not merge</i>	0.109 **	5.41	(0.295) ***	(14.25)	(0.079) ***	(3.60)	0.031 **	1.65
<i>Account manager turnover - ordinal</i>								
<i>Merged</i>	(0.297) ***	(5.86)	0.413 ***	7.40	0.109 *	1.83	(0.174) ***	(3.49)
<i>Did not merge</i>	(0.219) ***	(4.97)	0.364 ***	8.09	0.116 **	2.31	(0.156) ***	(3.74)
Chi-squared on equivalent relationship length/p-value	0.32	0.57	1.92	0.17	1.60	0.21	2.11	0.15
Chi-squared test on equivalent turnover/p-value	1.89	0.17	0.80	0.44	0.01	0.91	0.10	0.75

* Coefficient is significant at the 10% level
 ** Coefficient is significant at the 5% level
 *** Coefficient is significant at the 1% level

TABLE 7-B

Multivariate Results for Effect of Banking Consolidation on
Small Business Loan Search and Credit Availability—Bank Size Stratification

Multivariate Results for Effect of Banking Consolidation on Small Business Loan Search and Credit Availability Bank Size Stratification						
The dependent variables are defined the same as in Table 7-A. The small bank sample includes only those respondents reporting a primary bank with assets under \$100 million. Medium bank is defined to include primary banks with assets between \$100 million and \$1 billion. The large bank sample includes underprimary banks with assets in excess of \$1 billion. All of the control variables in Table 7-A were included but are not reported here.						
	Small Banks		Medium Banks		Large Banks	
	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.
All Borrowing Needs Met						
<i>Merged/Absorbed in last 3 years</i>	(0.229)	(1.13)	(0.298)	(1.87)	(0.068)	(0.54)
<i>Length of relationship</i>	0.062	1.46	0.089	2.32	0.161	5.09
<i>Account manager turnover</i>	(0.293)	(3.28)	(0.142)	(1.75)	(0.269)	(4.49)
<i>Small market (rural, small city, city)</i>	0.172	0.89	0.294	1.93	0.333	2.55
Number of observations	391		482		659	
Mean of dependent variable	0.82		0.81		0.77	
Shopped for a New Bank						
<i>Merged/Absorbed in last 3 years</i>	0.181	1.01	0.494	3.39	0.254	2.20
<i>Length of relationship</i>	(0.271)	(6.98)	(0.404)	(10.75)	(0.268)	(8.55)
<i>Account manager turnover</i>	0.385	4.06	0.320	4.09	0.322	5.53
<i>Small market (rural, small city, city)</i>	0.118	0.76	0.062	0.46	0.048	0.42
Number of observations	425		561		687	
Mean of dependent variable	0.33		0.35		0.37	
Number of Searches						
<i>Merged/Absorbed in last 3 years</i>	0.343	1.82	0.031	0.26	0.049	0.37
<i>Length of relationship</i>	(0.014)	(0.34)	(0.049)	(1.55)	(0.152)	(4.25)
<i>Account manager turnover</i>	0.041	0.44	0.185	2.90	0.047	0.71
<i>Small market (rural, small city, city)</i>	0.132	0.82	(0.220)	(1.48)	(0.056)	(0.43)
Number of observations	431		919		701	
Mean of dependent variable	1.62		1.73		1.68	
Credit Extended						
<i>Merged/Absorbed in last 3 years</i>	0.048	0.25	0.033	0.23	0.111	0.95
<i>Length of relationship</i>	(0.026)	(0.65)	0.017	0.50	0.062	2.12
<i>Account manager turnover</i>	(0.187)	(2.12)	(0.152)	(2.29)	(0.171)	(3.10)
<i>Small market (rural, small city, city)</i>	0.155	1.00	0.100	0.81	0.350	3.00
Number of observations	511		691		838	
Mean of dependent variable	0.96		0.84		0.79	
* Coefficient is significant at the 10% level						
** Coefficient is significant at the 5% level						
*** Coefficient is significant at the 1% level						

TABLE 8

Incidence of Fees

Number of services with fees	Financial Institution Bought or Absorbed		Overall
	Yes	No	
(1) Decreased substantially	2%	1%	1%
(2) Decreased slightly	3%	1%	3%
(3) Stayed the same	42%	4%	50%
(4) Increased slightly	30%	53%	29%
(5) Increased substantially	15%	29%	11%
Don't know	6%	9%	5%
No answer	3%	4%	1%
Mean of categories (1) - (5)*	3.72	3.55	3.6
t-statistic	3.47		
Fees per unit of service			
(1) Decreased substantially	2%	2%	2%
(2) Decreased slightly	1%	1%	1%
(3) Stayed the same	3%	3%	3%
(4) Increased slightly	32%	45%	41%
(5) Increased substantially	42%	35%	37%
Don't know	13%	8%	9%
No answer	8%	8%	8%
Mean of categories (1) - (5)*	3.788	3.63	3.67
t-statistic	3.33		
Value increase with fee increase			
Yes	56%	68%	65%
No	39%	29%	31%
Don't know	4%	4%	4%
* Excludes respondents who answered 'yes' to 'value was increased with fee.'			

TABLE 9

Fee Changes by Bank Size

Asset Size (\$millions)	Number of fees Increased Substantially	Fees per unit Increased Substantially
Under \$50	11%	9%
\$50 - \$99	11%	8%
\$100 - \$999	11%	9%
\$1,000 - \$4,999	14%	14%
\$5,000 and up	15%	15%

TABLE 10-A

Multivariate Results for Effect of Banking Consolidation on Banking Service Fees Charged to Small Firms

Tobit analysis is used for both equations. The dependent variable in equation (1) is the number of services on which the respondent pays fees and in equation (2) it is the fees per unit of service. Both variables take on a value between "1" and "5" where "1" denotes 'decreased substantially' and "5" denotes 'increased substantially'. The sample for both equations includes all respondents that reported a successful loan search at a bank in the past 3 years.

The independent variables are defined in Table 7. Asymptotic t statistics are reported next to the coefficients for the tobit equations and are compared to critical values of the Student's t distribution.

Variable	(1) Number of Services with Fees		(2) Fees per Unit of Service	
	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.
Intercept	3.527	22.60	3.557	23.37
Merged/Absorbed in last 3 years	0.122	2.47	0.150	3.25
Length of relationship	0.031	2.57	0.020	1.77
Account manager turnover	0.144	5.86	0.091	4.02
Small market (rural, small city, city)	0.029	0.65	0.053	1.28
Medium bank (\$0.5 - 1.0 billion in assets)	0.016	0.29	(0.001)	(0.02)
Large bank (\$1 billion in assets or more)	0.080	1.46	0.108	2.10
Log (years in business)	(0.024)	(0.39)	0.004	0.15
Asset size	(0.021)	(1.48)	(0.022)	(1.66)
Log (sales)	(0.013)	(0.77)	(0.054)	(0.85)
Sales growth	(0.074)	(3.99)	(0.315)	(3.12)
Number of observations	1727		1653	
Mean of dependent variable	3.466		3.543	
Interactive Merger/Relationship Variables				
<i>Length of relationship - ordinal</i>				
Merged	0.038	2.38	0.048	3.18
Did not merge	0.014	1.17	0.005	0.40
<i>Account manager turnover - ordinal</i>				
Merged	0.139	4.19	0.083	2.72
Did not merge	0.139	5.03	0.109	4.26
Chi-squared on equivalent relationship length/p-value	2.15	0.14	8.69	0.00
Chi-squared test on equivalent turnover/p-value	-	0.99	0.60	0.44
* Coefficient is significant at the 10% level				
** Coefficient is significant at the 5% level				
*** Coefficient is significant at the 1% level				

TABLE 10-B

**Multivariate Results for Effect of Banking Consolidation on Banking Service Fees Charged to Small Firms
Bank Size Stratification**

The dependent variables are defined the same as in Table 10-A. The small bank sample includes only those respondents reporting a primary bank with assets under \$100 million. Medium bank is defined to include primary banks with assets between \$100 and \$1 billion. The large bank sample includes underprimary banks with assets in excess of \$1 billion. All of the control variables in Table 10-A were included but are not reported here.

	Small Banks		Medium Banks		Large Banks	
	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.
No. of Services With Fees						
<i>Merged/Absorbed in last 3 years</i>	0.006	0.06	0.256 ***	3.05	0.164 **	2.21
<i>Length of relationship</i>	0.046 **	2.10	0.013	0.66	0.005	0.24
<i>Account manager turnover</i>	0.094 ***	1.89	0.059	1.44	0.079 **	2.17
<i>Small market (rural, small city, city)</i>	(0.012)	(0.14)	0.191 ***	2.62	(0.034)	(0.47)
Number of observations	351		510		638	
Mean of dependent variable	3.49		3.50		3.61	
Fees Per Unit of Service						
<i>Merged/Absorbed in last 3 years</i>	0.156	1.43	0.207 **	2.38	0.048	0.62
<i>Length of relationship</i>	0.070 ***	3.00	0.001	0.05	0.020	0.96
<i>Account manager turnover</i>	0.194 ***	3.62	0.150 ***	3.50	0.097 **	2.50
<i>Small market (rural, small city, city)</i>	(0.165) *	(1.80)	0.236 ***	3.12	(0.077)	(0.99)
Number of observations	402		537		651	
Mean of dependent variable	3.42		3.45		3.51	

* Coefficient is significant at the 10% level

** Coefficient is significant at the 5% level

*** Coefficient is significant at the 1% level

TABLE 11

Contract Loan Terms

	Financial Institution Bought or Absorbed			<u>t-statistic</u>
	<u>Yes</u>	<u>No</u>	<u>Overall</u>	
Average loan rate (N=1,408) ¹	8.98%	9.10%	9.06%	(1.31)
Collateral delivery required (N=1,516) ²	71%	64%	66%	2.56
Average loan-to-value (N= 721) ³	0.65	1.21	1.05	(1.48)
Other financial business required (N= 1,502) ⁴	36%	25%	28%	3.82

¹ Includes only loans for working capital or fixed asset purchases
² All loans where a collateral delivery status is reported
³ Only those loans where collateral delivery is reported as well as a market value for the collateral
⁴ All loans where a 'yes' or 'no' response is given.

TABLE 12-A

Multivariate Results for Effect of Banking Consolidation on Loan Contract Terms

Binomial probit analysis is used for equation (2) and (4), tobit analysis is used for equation (1) and (3). The sample for equations (1) - (4) includes all respondents that reported a successful loan search at a bank in the past 3 years at a commercial bank. The dependent variable in equation (1) the interest rate paid on the most recent loan. The dependent variable in equation (2) takes the value of "1" if the respondent reported the delivery of collateral and "0" otherwise. The dependent variable in equation (3) takes on a value between "1" and "6," the categories for the loan-to-value ratio reported in Table 11. The dependent variable in equation (4) takes on the value of "1" if other business services were required from the bank as a condition of the loan and "0" otherwise.

The independent variables are defined in Table 7. Asymptotic t statistics are reported next to the coefficients for the tobit and probit equations and are compared to critical values of the Student's t distribution.

Variable	(1) Interest Rate		(2) Collateral Delivery		(3) Loan-to-Value Ratio		(4) Other Business Required	
	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.
Intercept	10.852 ***	31.97	(0.195)	(0.70)	-0.594 ***	6.58	(0.791) ***	(2.90)
Merged/Absorbed in last 3 years	(0.073)	(0.72)	0.162 *	1.81	0.029	1.05	0.177 **	2.02
Length of relationship	(0.047) *	(1.90)	(0.041) *	(1.81)	0.002	0.30	(0.091) ***	(4.28)
Account manager turnover	0.036	0.71	0.065	1.44	(0.040) ***	(2.74)	0.142 ***	3.21
Small market (rural, small city, city)	0.036	0.41	0.020	0.25	0.026	1.01	(0.090)	(1.13)
Medium bank (\$0.5 - 1.0 billion in assets)	(0.142)	(1.29)	(0.112)	(1.15)	(0.049)	(1.54)	(0.043)	(0.42)
Large bank (\$1 billion in assets or more)	(0.231) **	(2.06)	(0.169)	(1.91)	(0.058)	(1.77)	0.148	1.46
Log (years in business)	(0.022)	(0.36)	(0.005)	(1.40)	(0.002)	(1.44)	(0.004)	(1.12)
Asset size	(0.087) ***	(2.66)	(0.051)	(1.75)	(0.008)	(0.87)	0.004	0.16
Log (sales)	(0.073) *	(1.83)	(0.051)	(1.41)	(0.019) *	(1.72)	(0.041)	(1.21)
Sales growth	(0.061)	(1.62)	0.043	1.29	0.015	1.39	(0.058)	(1.73)
Number of observations	1278		1362		625		1,347	
Mean of dependent variable	9.06		0.66		0.54		0.28	
Pearson Chi-Square			173				136	
Degrees of freedom			40				34	
p value			0.00				-	
Interactive Merger/Relationship Variables								
<i>Length of relationship - ordinal</i>								
Merged	(0.070) **	(2.14)	(0.013)	(0.43)	0.001	0.14	(0.054) *	(1.91)
Did not merge	(0.011)	(0.43)	(0.063) ***	(2.69)	0.002	0.25	(0.100) ***	(4.51)
<i>Account manager turnover - ordinal</i>								
Merged	0.113	1.58	0.027	0.42	(0.029) **	(1.46)	0.151 **	2.50
Did not merge	0.030	0.52	0.072	1.41	(0.048) **	(2.87)	0.177 ***	3.51
Chi-squared on equivalent relationship length/p-value	3.23	0.07	3.030	0.08	-	0.66	2.580	0.11
Chi-squared test on equivalent turnover/p-value	1.03	0.31	0.370	0.54	0.650	0.42	0.130	0.71

* Coefficient is significant at the 10% level
 ** Coefficient is significant at the 5% level
 *** Coefficient is significant at the 1% level

TABLE 12-B

Multivariate Results for Effect of Banking Consolidation on Loan Contract Terms
Bank Size Stratification

The dependent variables are defined the same as in Table 12-A. The small bank sample includes only those respondents reporting a primary bank with assets under \$100 million. Medium bank is defined to include primary banks with assets between \$100 million and \$1 billion. The large bank sample includes underprimary banks with assets in excess of \$1 billion. All of the control variables in Table 12-A were included but are not reported here.

	Small Banks		Medium Banks		Large Banks	
	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.	Coefficient	Coeff./S.E.
Interest Rate						
<i>Merged/Absorbed in last 3 years</i>	(0.649) ***	(2.571)	(0.061)	(0.37)	0.096	0.65
<i>Length of relationship</i>	(0.047)	(0.878)	0.031	0.78	(0.082) *	(1.91)
<i>Account manager turnover</i>	0.142	1.171	0.044	0.53	(0.046)	(0.61)
<i>Small market (rural, small city, city)</i>	0.073	0.379	(0.066)	(0.48)	0.004	0.02
Number of observations	297		418		493	
Mean of dependent variable	9.41		9.10		8.84	
Collateral delivery						
<i>Merged/Absorbed in last 3 years</i>	0.035	0.16	0.189	1.08	0.264 *	1.90
<i>Length of relationship</i>	-	-	(0.032)	(0.76)	(0.100) **	(2.44)
<i>Account manager turnover</i>	0.058	0.56	0.101	1.18	0.021	0.30
<i>Small market (rural, small city, city)</i>	(0.206)	(1.22)	0.172	1.21	(0.019)	(0.14)
Number of observations	365		448		516	
Mean of dependent variable	0.68		0.65		0.66	
Loan-to-value ratio						
<i>Merged/Absorbed in last 3 years</i>	0.045	0.57	0.038	0.62	0.034	0.65
<i>Length of relationship</i>	0.001	0.09	0.010	0.70	(0.007)	(0.51)
<i>Account manager turnover</i>	(0.012)	(0.28)	(0.083) **	(2.58)	(0.010)	(0.38)
<i>Small market (rural, small city, city)</i>	0.086	1.34	0.053	0.94	0.030	0.56
Number of observations	150		214		226	
Mean of dependent variable	0.58		0.54		0.51	
Other financial services required						
<i>Merged/Absorbed in last 3 years</i>	0.328	1.57	0.198	1.25	0.115	0.92
<i>Length of relationship</i>	(0.073) *	(1.75)	(0.126) **	(3.58)	(0.116) ***	(3.42)
<i>Account manager turnover</i>	0.348 ***	3.32	0.060	0.78	0.113 *	1.81
<i>Small market (rural, small city, city)</i>	(0.339) **	(2.00)	(0.101)	(0.75)	(0.121)	(0.99)
Number of observations	357		490		559	
Mean of dependent variable	0.24		0.26		0.33	

* Coefficient is significant at the 10% level
 ** Coefficient is significant at the 5% level
 *** Coefficient is significant at the 1% level

Notes

- ¹ "Changes in Number of Commercial Banks" (online) Available: <http://www2.fdic.gov/hsob/>.
- ² This result is consistent with Berger et al., (1998) which found that other lenders made credit available to borrowers displaced by a merger.
- ³ This result was consistent with Goldberg and White's (1998) finding that de novo banks lend proportionally more to small firms than existing banks of comparable size.
- ⁴ Gross sales, employees, and years in business were reported as ordinal variables, not in categories.
- ⁵ The representativeness of the NFIB membership of the small business sector has been documented in William C. Dunkelberg and J.A. Scott, 1983, *Report on the Representativeness of the National Federation of Independent Business Sample of Small Firms in the United States*, mimeo, Small Business Administration grant #SBA2A-0084-01, Purdue University, West Lafayette, IN.
- ⁶ Scott [1998] describes the importance of account manager turnover in assessing the strength of banking relationships. Certain knowledge about small firms (agent memory) resides with the specific account manager that cannot be summarized by financial statement analysis, loan repayment history, or the firm's use of other banking products. Part of the value-added by account managers is their assessment of non-financial aspects of the firm's operations and management when making the lending decision, such as an assessment of the borrower's ability to deal with a crisis or respond to changing market conditions. This knowledge gained by the account manager is valuable and, if lost, would adversely affect the cumulative knowledge gained as part of the relationship.
- ⁷ Scott and Dunkelberg (1999) document the impact of mergers on service delivery for the small firms in this survey. Firms reporting mergers rated their banks significantly worse on accessibility of account manager, services offered, capability of staff, continuity of account manager, and lending criteria.
- ⁸ The sign on the merger variable was positive, but not significant. We should not be surprised that total searches were higher for firms whose major bank had merged.
- ⁹ The coefficients reported in Table 7-A are the probit coefficients. The marginal probabilities are derived from these estimates.
- ¹⁰ The survey data support this conclusion. For example, only 14% of the non-merging firms report three or more account officers compared to 26% of the merged firms. Firms whose major bank merged report changing their financial institution within the prior two years at twice the rate of customers of the non-merging firms(9%).
- ¹¹ If the respondent resides in a small market, then the probability of having all borrowing needs met increases by .04, the number of searches increases by .15 and the probability of the loan being extended increases by .06.
- ¹² The sample has been restricted to those loans where the reported purpose is for working capital or fixed assets. Loans for refinancing or to pay off other business loans were excluded because of the higher probability of these activities

being associated with financial distress. The focus of our analysis is to isolate the impact of mergers on creditworthy firms.

- ¹³ The 1.21 mean loan-to-value ratio for firms that did not merge in Table 11 results from some extreme outliers that presumably had to pledge only a minimal amount of collateral to obtain their loan.

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APPENDIX

Demographic and Financial Services Characteristics of Survey Respondents

Selected characteristics of the 1995 Credit, Banks and Small Business survey of the membership of the National Federation of Independent Business. There were 3,642 respondents to the over 18,000 surveys that were mailed to a sample of the 600,000 members of the NFIB for a 24% response rate. The column sums may not add to 100% due to rounding.

A. Demographic Characteristics

<u>Form of Business</u>		<u>Years in Business</u>		<u>Full-Time Equivalent Employees</u>	
Proprietorship	31%	1-2	6%	One	7%
Partnership	6%	3-4	9%	Two	9%
Corporation	42%	5-6	9%	3-5	30%
S-Corporation	21%	7-10	18%	6-9	19%
No answer	0%	11-15	18%	10-14	11%
		16-20	14%	15-19	6%
<u>Industry</u>		Over 20	25%	20-39	9%
Construction	13%	No answer	1%	40 or more	7%
Manufacturing	13%			No answer	3%
Transportation	3%				
Wholesale	6%	<u>Total Asset Value (\$000)</u>		<u>Gross Sales (\$000)</u>	
Retail	21%	Under 80	14%	Under 50	4%
Agriculture	8%	80-99	14%	50-99	6%
Finance	7%	100-199	16%	100-199	12%
Service	21%	200-499	24%	200-349	16%
Professional	5%	500-999	13%	350-499	8%
No answer	4%	1,000-1,999	8%	500-799	11%
<u>Location</u>		2,000-4,999	4%	800-1,499	13%
Metropolitan (1+ million)	29%	5,000 or more	2%	1,500-2,999	9%
Large city (250k to 1 million)	24%	No answer	4%	3,000 or more	14%
City (20k to 250k)	18%			No answer	8%
Small city (2.5 to 20k)	25%				
Rural	4%				

B. Financial Institution Characteristics

<u>Financial Institution Bought or Sold In Past Three Years</u>		<u>Loan source</u>		<u>Year of last loan attempt</u>	
Yes	25%	Bank	82%	1995	9%
No	72%	Credit Union	2%	1994	39%
No answer	3%	Finance company	4%	1993	13%
		Other financial co.	2%	1992	7%
<u>Bracketed Bank Size</u>		Friend, relative	6%	1991	4%
Less than \$50 million	10%	Other	4%	1990 or earlier	16%
\$50 - \$99.99 million	12%			No answer	12%
\$100 - \$999.9 million	30%	<u>Number of Account Managers in the Last Three Years</u>		<u>Last Time Changed Principal Financial Institution</u>	
\$1.0 - 4.999 billion	15%	1	48%	More than 5 years	64%
\$5.0 billion and up	26%	2	29%	4-5	10%
Don't borrow	6%	3	12%	3-4	6%
<u>Applied for Loan (n=3642)</u>		4	3%	2-3	6%
Extended credit	78%	5 or more	1%	1-2	5%
Denied	10%	No answer	7%	Within last year	6%
Did not apply/no ans	12%			No answer	4%

COOKIE-CUTTER VERSUS CHARACTER: THE MICRO STRUCTURE OF SMALL BUSINESS LENDING BY LARGE AND SMALL BANKS

Rebel A. Cole
Krahenbuhl Financial Consulting

Lawrence G. Goldberg
University of Miami

Lawrence J. White
New York University

Consolidation in the U.S. banking system has focused attention on the differences in lending between large and small banks because large banks lend proportionately less to small business. We use a survey of small businesses conducted by the Federal Reserve to analyze the micro-level differences between large banks and small banks in the loan approval process. We provide evidence that large banks (\$1 billion or more in assets) employ standard criteria obtained from financial statements in the loan decision process, but that small banks (less than \$1 billion in assets) deviate from these criteria by relying to a larger extent upon the character of the borrower. These “cookie-cutter” and “character” approaches are consistent with the incentives and environments facing large and small banks.

Introduction

The availability of credit to small businesses has long been an area of concern to U.S. policy makers, as well as to small businesses. The United States Congress codified this concern in Section 477 of the FDIC Improvement Act of 1991, which requires that the Federal Reserve Board annually collect and publish information on the availability of credit to small businesses.

Ongoing consolidation in the U.S. banking industry has increased the urgency of this issue, with the number of U.S. commercial banks declining from 14,400 in 1980 to less than 10,000 as of year-end 1997. During this same period, banking industry assets have become increasingly concentrated within the group of money-center and super-regional banks. Together, these trends have given pause to both regulators and policymakers because large banks allocate proportionately fewer assets to small business loans than do small banks. Consequently, it is important to understand how banks make

small business loans and, in particular, to uncover differences, if any, between the loan approval processes at large and small banks. Anecdotal evidence suggests that large banks may use standard quantitative sets of criteria for assessing whether small-business loans should be granted, i.e., a “cookie-cutter” approach, whereas small banks employ more qualitative criteria based upon their loan officers’ personal interactions with prospective borrowers, i.e., the “character” approach. Recent surveys such as Whiteman (1998) support this distinction, indicating that only 12% of small “community banks” use credit scoring models for small business loans, whereas over two-thirds of larger banks use such models for their small business lending.

The purpose of this study is to provide empirical evidence regarding any demonstrable differences in the way that small and large banks make small business loans. We explicitly test the hypothesis that the formal financial data provided by an applicant firm better explain the lending decisions of large banks than of small banks. Hence, this study provides valuable input to policy makers and regulators for evaluating the effects of banking consolidation on the availability of credit to small businesses.

The effect of the consolidation in banking on the availability of credit to small-business borrowers has been examined in a number of recent studies (see, e.g., Peek and Rosengren, 1998; Strahan and Weston, 1998; Berger et al., 1997; and Walraven, 1997). Other studies have examined the importance of relationship banking and have explored the effects due to the differences in borrower characteristics (see, e.g., Cole, 1998; Berger and Udell, 1995, 1996; and Petersen and Rajan, 1994, 1995). A distinguishing feature of this study is that we focus on characteristics of both the borrower and the lender, which enables us to examine the micro structure of the decision to lend to small businesses. In so doing, we find significant differences in lending approaches of small and large banks.

We performed our empirical analysis using data from the 1993 National Survey of Small Business Finances (NSSBF), which was funded by the Federal Reserve Board and the U.S. Small Business Administration and released to the public during 1997. In analyzing the lender’s decision to allocate small business credit, we provide evidence that large banks (\$1 billion or more in consolidated assets) employ standard criteria obtained from financial statements in the loan decision process, whereas small banks (less than \$1 billion in consolidated assets) do not follow these criteria as closely, relying more upon their loan officers’ impressions of the borrower’s character gathered from interactions between the bank and borrower.

Section I surveys the relevant academic literature, shows how the current study ties these different strands together, and contributes to the analysis of an important public policy question. Section II discusses

relationship banking and the differences in the loan approval process that could be expected between large and small banks. Section III describes the small business finance survey that serves as the primary source of the data, and specifies the specific variables used and the hypotheses tested in the analysis. Section IV presents the empirical analysis testing the hypotheses. The final section concludes with a summary of the paper, its policy implications, and suggestions for further research.

Survey of the Literature (Section I)

The first of several strands of literature that are directly relevant to this study deals with credit availability and bank consolidation. Of particular concern is credit availability to small businesses. The informational problems associated with loans to small businesses may be more easily solved by small banks that are headquartered geographically close to the borrower rather than large banks with centralized decision-making (Berger et al., 1998) and greater lending opportunities. Recent empirical evidence indicates that small banks lend proportionately more to small enterprises (Nakamura, 1993; Keeton, 1995; Berger et al., 1995; Levonian and Soller, 1995; Berger and Udell, 1996; Peek and Rosengren, 1996; and Strahan and Weston, 1996, 1998). The rapid consolidation of the banking system raises concerns that lending to small businesses will be reduced as small banks are absorbed by larger banks. Some studies find that mergers reduce lending to small businesses (Peek and Rosengren, 1996; Berger et al., 1998), while others do not find this (Whalen, 1995; Strahan and Weston, 1996, 1998). This reduction in lending to small businesses can be mitigated by the creation of new banks if the *de novo* banks lend more to small businesses than do comparable incumbent banks. Goldberg and White (1998) find that *de novo* banks (those in operation for less than three years) do make more small business loans. DeYoung et al., (1999) extend this study and find that as the *de novo* banks age they make proportionately fewer loans to small businesses while holding other factors constant. The formation of *de novo* banks appears to be important for small business lending in an era of bank consolidation.

Information about borrowers is vitally important to the lending process. Some suggest that agency costs and information asymmetries have reduced the investment flow to profitable companies (see, e.g., Stiglitz and Weiss, 1981). Large lending institutions can produce substantial bodies of information about borrowing firms that can be very helpful in the credit decision process (see, e.g., Leland and Pyle, 1977; and Diamond 1984, 1991). Because of scale economies and durable information, a firm having a longer pre-existing relationship with its bank should have greater availability of funds and/or lower cost of funds. Substantial literature exists claiming that financial intermediaries

have a comparative advantage in the production of information about borrowers (see e.g., Diamond, 1984, 1991; Ramakrishnan and Thakor, 1984; and Boyd and Prescott, 1986). The model of Boot and Thakor (1994) predicts that, as a relationship matures, interest rates decrease and collateral requirements decline. Other models predict that interest rates will increase as the relationship lengthens (see e.g., Greenbaum et al., 1989; Sharpe, 1990; and Wilson, 1993). Finally, a number of studies measure the effect of a bank relationship on firm value, and find positive abnormal returns for events indicating renewals of the relationships (see e.g., James, 1987; and Billett et al., 1995). In this study, we emphasize the differences between large and small banks in their use of information about borrowers.

Five recent studies provide the most relevant empirical evidence related to the current paper. Using data from the 1987 NSSBF, an earlier survey of small business financing conducted by the Federal Reserve Board and the U.S. Small Business Administration, Petersen and Rajan (1994) examine the value of lending relationships. They find that a relationship with an institutional lender increases the availability of financing to a small business. Relationships reduce the cost of borrowing, but this effect is smaller than the availability effect. If borrowers attempt to employ multiple lenders, the price of borrowing increases, and the availability of credit decreases.

In a second paper using data from the 1987 NSSBF, Petersen and Rajan (1995) explore the effect of credit market competition on lending relationships. Because a lender is more assured of a continuing relationship with a small-business borrower located in a more concentrated banking market, lenders tend to provide more credit at lower rates in more concentrated markets. These results hold for young firms, but weaken as the borrowing firm ages.

Berger and Udell (1995) use data from the 1987 NSSBF to analyze the importance of relationship between banks and borrowers in the extension of lines of credit to small businesses. They find that a firm with a longer relationship is offered a lower loan rate and a lower likelihood that collateral is required. This provides additional evidence of the value of the information about the borrower obtained by the lender from a long-term relationship.

Berger and Udell (1996) is the only study of which we are aware that examines the differences in lending practices between large and small banks. Using loan data drawn primarily from the Federal Reserve's Survey of the Terms of Bank Lending to Business, they test several hypotheses concerning relationship lending and the availability of credit to small businesses. With respect to small business loans, Berger and Udell find that large banks charge lower loan rates, require less collateral, and issue fewer loans than do small banks. These empirical results support their hypothesis that large banks

supply relatively less credit to small “relationship borrowers” but do not reduce credit to small “ratio borrowers” whose creditworthiness can be judged by examining their financial ratios.

Cole (1998) examines the effect of relationships on the availability of credit by looking more carefully at the nature of the relationship. Like the current study, Cole uses data from the more recent 1993 NSSBF, which we describe in Section III. As do the studies already discussed, Cole finds that lenders are more likely to extend credit if they have a pre-existing relationship with a borrower, consistent with the generation of private information by such relationships. However, he finds no incremental effect from pre-existing relationships of longer duration than one year. Hence, his results suggest that banks generate the valuable private information about its customers quickly, and that this information can be regenerated by other banks if it is lost because of the merger or failure of the original bank. Using firm characteristics as proxies for reputation effects, he finds that the importance of firm-lender relationships is independent of reputation effects.

None of these studies except Berger and Udell (1996), to some extent, have explored the differences in the microlevel behavior by different types of banks. In this study, we extend the previous literature by examining behavioral differences between large and small banks in loan approvals.

Large Banks and Small Banks (Section II)

The previous research clearly indicates that firm-lender relationships influence the availability of credit to the firm. We hypothesize that relationships are more important for small banks than for large banks. This is due to organizational and operational differences between large and small banks, which we explore in this section.

The operational differences between small and large banks with respect to lending can be explained by the theory of hierarchical control contained in Williamson (1967). As the size of an organization increases, loss of control occurs between successive hierarchies. As managerial orders and directions are transmitted to successive hierarchical levels, distortions increase. Consequently, a large bank needs explicit rules in the lending process in order to avoid distortions. Because there are fewer intermediaries between top management and lending officers in small banks, the small banks’ loan officers can be granted more discretion in the lending process and thus are more likely to deviate from the “cookie-cutter” approach.

Similarly, large banks, which we define as those with \$1 billion or more in consolidated assets, generally have more branches and are more geographically dispersed than are the small banks, which we define as those with less than \$1 billion in consolidated assets. In order

to keep control over the whole organization, large banks must establish procedures that will be followed throughout the whole organization. As an organization increases in size and geographic extent, it becomes more difficult for the top management to monitor the behavior of employees; agency problems arise. To ensure that loans are being granted in an appropriate manner, management must establish standards that can be followed easily by loan officers and that can be readily monitored and enforced by supervisors. Consequently, we expect large bank managers would develop a loan approval system that would lead to a consistent approach across branches and personnel. By necessity, the approach would have to employ easily obtained and verifiable information about the borrowers, such as financial ratios obtained from company financial statements. Consequently, we expect a “cookie-cutter” approach in the loan approval process of large banks, with standard financial variables and ratios of potential borrowers significantly affecting the credit allocation decisions of large banks.¹

In contrast, small banks do not face agency and control problems that are as severe as those faced by large banks. Top management can more easily monitor the behavior of loan officers and coordinate the operation of various parts of the institution. There is less need to establish rigid standards for lending. More flexibility is possible and often is desirable. Small banks are likely to have more private information about potential borrowers because of proximity and a more personal relationship between banker and customer. Furthermore, ownership and management are more likely to be the same or closely allied in the small bank, thus reducing agency problems between owners and managers as described by Jensen and Meckling (1976). Consequently, we expect small banks to use information about the borrower obtained through relationships and from other sources and thus for small banks to employ more of a “character” approach. This would mean that small banks might grant loans to customers who do not meet the standardized requirements that larger banks would employ. To confirm this hypothesis, the empirical evidence should show that small banks’ lending decisions adhere less strictly to standardized financial variables than do large banks’ decisions.

The empirical evidence below tests these hypotheses about the differences between large and small banks in allocating credit to small businesses. Our evidence provides confirmation that large and small banks do behave differently.

Data and Hypotheses (Section III)

The data used in this study are taken primarily from the 1993 National Survey of Small Business Finances (NSSBF), which was co-sponsored

and co-funded by the Federal Reserve Board and the U.S. Small Business Administration.² The firms surveyed constitute a nationally representative sample of 4,637 small businesses operating in the U.S. as of year-end 1992, where a small business is defined as a non-financial, non-farm enterprise employing fewer than 500 full-time equivalent employees. These data are broadly representative of approximately 5.0 million firms operating in the U.S. as of year-end 1992.

The NSSBF provides detailed information about each enterprise's most recent borrowing experience during 1990-94, including whether the firm applied for credit, the identity and characteristics of the potential lender to which the firm applied, other financial services (if any) the firm obtained from that potential lender, whether the potential lender denied or extended credit to the firm, and, if the lender extended credit, what were the terms of the loan. The survey data also provide information on each enterprise's balance sheet; its credit history; the firm's characteristics, including standard industrial classification (SIC) category, organizational form, and age; and demographic characteristics of each firm's primary owner, including age, education, experience, and credit history. Balance sheet and income statement data are derived from the enterprise's year-end 1992 financial statements. Credit history, firm characteristics, and demographic characteristics of each firm's primary owner are taken as of year-end 1993. It is for this reason that the survey is known as the "1993" NSSBF.

For the purposes of our study, we focus on the loan applications that were made by an enterprise to an identifiable commercial bank. To avoid potential endogeneity problems that might arise when the date of the loan application preceded the date of the firm's financial data, we have restricted our sample to those firms that applied for loans during 1993 or 1994, excluding applications made during 1990-92. Finally, to ensure that the sample is applicable to small-business lending, we excluded observations where the applying small firm's sales, assets, or the loan request exceeded \$10 million. This process produced a final sample of 1,102 loan applications. For 83.1% of these applications, the bank agreed to extend credit to the small firm.

To classify the bank to which the loan application was made by size, we matched NSSBF data identifying the bank to which the firm applied with Call Report data obtained from the Federal Reserve System's National Information Center. Specifically, we matched NSSBF data with Call Report data on consolidated banking assets as of the year-end preceding the year in which the application was made. Hence, we matched loan applications made during 1994 (1993) with year-end 1993 (1992) Call Report data.

The loan applicants in this sample are a self-selected group. Presumably, only those enterprises whose owners believed that they

had a high probability of obtaining a loan from the identified bank to which they applied would have bothered to have applied for the loan from that bank. Nevertheless, not all of them were in fact successful, and the characteristics of those who were successful and unsuccessful, as well as the characteristics of the bank that approved or rejected the application, provide us with the basis for testing our hypotheses. To try to control for the bias that might arise with respect to a loan applicant's choice of a large bank or a small bank, we have estimated a simultaneous model in which the loan applicant's choice of size of bank to which to apply and the bank's accept/reject decision with respect to that loan application are modeled by two separate equations that are estimated jointly.

Table I displays the variables extracted from the NSSBF and from the FDIC Call Reports that are used in our analyses of the credit allocation decision, along with brief definitions, means, standard errors, and ranges.³ The remainder of this section will expand on those variable definitions and on how we will use the variables to test the hypotheses discussed in Section III.

The dependent variable that we use in all of our tests of the accept/reject decision is *Loan Approved*: a 1,0 variable indicating whether the bank approved or denied the enterprise's request for a loan. As noted above, the loan was approved 83.1% of the time.

We group our explanatory variables into four categories: (i) the applicant enterprise's characteristics, including its (and its primary owner's) credit history and financial relationships; (ii) the characteristics of the requested loan; (iii) the characteristics of the relationship between the loan applicant and the bank; and (iv) the bank's characteristics. We will first present our general expectations as to the relationships between these variables and our dependent variable (*Loan Approved*); we will then discuss our more specific expectations as to the differences that we would expect to find in the behavior of larger banks and smaller banks.

General Hypotheses

Firm Characteristics

Our general expectations fundamentally follow those of Berger and Udell (1993) and Berlin (1996). Lenders will lend only when they have high expectations of being repaid and thus will strongly favor borrowers with characteristics that reassure the bank as to the likelihood of being repaid.

Firm Size is the applicant firm's sales in thousands of dollars as of year-end 1992. We expect that larger firms would be able to provide more reassurance to a bank that its loan would be repaid and thus would be more likely to be accepted for a loan. We expect a positive

relationship between *Firm Size* and *Loan Approved*. The natural logarithm of firm size $\ln(\text{Firm Size})$ is used in our regressions.⁴

Firm Age is the applicant firm's age in years as of year-end 1992. We expect that an older firm, with a more established track record, would be more likely to be accepted for a loan. We expect a positive relationship between *Firm Age* and *Loan Approved*. The natural logarithm of firm age $\ln(\text{Firm Age})$ is used in our regressions.

ROA is the applicant firm's return on assets, its profits for 1992 divided by its assets as of year-end 1992. Greater profitability should provide a bank with greater reassurance as to repayment. We expect a positive relationship between *ROA* and *Loan Approved*.

Debt-to-Assets is the ratio of the applicant firm's debt to its assets, as of year-end 1992.⁵ We expect that firms with lower debt ratios are less likely to become insolvent and thus would be more likely to be accepted for a loan. We expect a negative relationship between *Debt-to-Assets* and *Loan Approved*.

Cash-to-Assets is the ratio of the applicant firm's cash to its total assets. A more liquid firm would likely provide greater reassurance to a lender of the prospects for repayment. We expect a positive relationship between *Cash-to-Assets* and *Loan Approved*.

Firm Delinquencies is the number of credit obligations on which the firm was delinquent during the previous three years.⁶ More past delinquencies should discourage a bank from lending to a loan applicant. We expect a negative relationship between *Firm Delinquencies* and *Loan Approved*.

Owner's Delinquencies is the number of credit obligations on which the primary owner of the firm has been delinquent during the previous three years. More delinquencies should discourage the bank from lending. We expect a negative relationship between *Owner's Delinquencies* and *Loan Approved*.

African-Am Owner is a 1,0 dummy variable indicating whether the firm's owner was identified as a member of a minority (African-American) group. This variable may be the basis for indications as to whether the bank is practicing race-based discrimination. Alternatively, this variable may be playing a different role: The owner's assets and income are generally known by the bank, but were not reported in the survey data; and the owner's credit history is better known by the bank than is reported in the survey. Data from the Federal Reserve Board's *Survey of Consumer Finances* demonstrate that minority households have significantly lower asset and income levels and worse credit histories than do non-minority households. Hence, this variable may simply be a proxy for those asset, income, and credit-history differences. In essence, this variable is a proxy (albeit imperfect) for an important component of the "credit score" of the firm's primary owner. Because greater owner assets and higher owner

income should provide greater reassurance to the bank as to the prospects for repayment, we expect a negative relationship between *African-Am Owner* and *Loan Approved* at large banks. If, however, this variable is an indicator of race-based discrimination, we expect a negative relationship between *African-Am Owner* and *Loan Approved* at small banks, which are more likely to be located in more highly concentrated banking markets. This follows from Becker (1971), who hypothesizes that racial discrimination should be more prevalent in less competitive credit markets.

SIC X is one of a set of nine 1,0 dummy variables that indicate the one-digit SIC code of the applicant firm.⁷ There may be some industry categories in which the borrowers are perceived to be less likely to fail and default and hence would be favored as loan applicants (or vice versa). We have no strong expectations with respect to these variables.

Loan Characteristics

Loan Amount is the amount of the requested loan in thousands of dollars. On the one hand, a larger loan is generally more profitable for a bank because there are fixed costs of applicant assessment and loan monitoring for a loan of any size; this would cause a bank to favor larger loans. On the other hand, there are loan portfolio diversification benefits from investing in a larger number of smaller loans, especially for small bank. In addition, there are regulatory restrictions on the size of a loan that a bank can make to one borrower,⁸ which may make them averse to approving requests for large loans. Accordingly, we cannot make a firm prediction as to the sign on the relationship between *Loan Amount* and *Loan Approved*. The natural logarithm of the loan amount $\ln(\text{Loan Amount})$ is used in our regressions.

Collateralized Loan is a 1,0 dummy variable indicating whether the requested loan was designated for the applicant firm's working capital, equipment, motor vehicles, or buildings, respectively. Working capital represents liquid assets (cash and inventories) that provide potential collateral for a bank's loans. The other three possibilities represent uses that also offer collateral. Consequently, we expect a positive relationship between *Collateralized Loan* and *Loan Approved*.

Relationship Characteristics

Deposit Relationship is a 1,0 dummy variable indicating whether the applicant firm already had a deposit account (checking or savings) at the bank. This type of prior relationship should generally be favorable for a loan applicant because it provides more information about the applicant for the bank. We expect a positive relationship between *Deposit Relationship* and *Loan Approved*.

Loan Relationship is a 1,0 dummy variable indicating whether the applicant firm already had another loan at the bank. The potential effects of this relationship are ambiguous. The prior loan relationship does give the bank additional information about the applicant; but that information could cause the bank to form a negative impression of the applicant. Further, for small banks the combined size of the applied for loan, plus the prior loan, might trigger concerns about the diversification of their portfolio and the regulatory restrictions on loans to one borrower.

Financial Mgt. Relationship is a 1,0 dummy variable indicating whether the applicant firm previously was obtaining financial management services from the bank. Financial management services include transaction services, cash management services, credit-related services, and trust services.⁹ This type of relationship should generally be considered favorable for the applicant. We expect a positive relationship between *Financial Mgt. Relationship* and *Loan Approved*.

Length of Relationship is the length of time in years of the longest relationship (if any) that the applicant has had with the bank. A longer relationship should generally give the bank more information about the applicant. On the other hand, for a wider sample of lenders Cole (1998) found that this variable was not significant, implying that only the most recent information was important. We expect a positive or insignificant relationship between *Length of Relationship* and *Loan Approved*. The natural logarithm of (one plus) the length of relationship $\ln(\text{Length of Relationship})$ is used in our regressions.

Number of Sources is the number of sources of financial services that are reported by the applicant firm. The greater the number of sources of financial services, the greater may be the bank's worries that its ability to collect in the event of foreclosure may be impaired. Equivalently, the bank would prefer that the applicant firm have fewer sources of financial services and more of them with that bank. We expect a negative relationship between *Number of Sources* and *Loan Approved*.

Bank Characteristics

Banks clearly do differ in their proclivities with respect to small business lending (Berger and Udell, 1996; DeYoung et al., 1999; Goldberg and White, 1998). We have selected a single bank characteristic, bank size, that other studies have shown to be important.¹⁰

Bank Assets is the bank's total assets (in millions of dollars), as of the year-end preceding the loan application. As was noted in Section II, numerous studies have shown that larger banks tend to be less inclined to lend to small businesses than are smaller banks. We expect a negative relationship between *Bank Assets* and *Loan Approved*. The natural logarithm of bank assets $\ln(\text{Bank Assets})$ is used in our regressions.

Specific Hypotheses for Large and Small Bank Differences

The specific motivation for this paper is to test whether big banks and small banks differ in the way that they approach the loan application approval/rejection decision for small business loans. Big banks are likely to be more bureaucratic, and their loan officers are more likely to make decisions “by the numbers.” Loan approval/rejection decisions are likely to be strongly based on the loan applicant’s easily verified financial data: a “cookie-cutter” process. Smaller banks may be less bureaucratic, and their loan officers may be able to use less formal and more subjective criteria in their decisions: “character” or relationship lending may be more important. Accordingly, we expect the formal financial data to be quantitatively and statistically more significant in explaining the lending decisions of large banks. Conversely, we expect the formal financial variables to provide a less satisfactory fit for a regression that tries to explain the lending decisions of small banks, since these variables are likely to fail to capture the subjective criteria that small banks employ in their decisions.

In Table II, we divide our sample into 517 “large” banks, those with consolidated assets of \$1 billion or more (as of year-end prior to the loan application), and 585 “small” banks, those with consolidated assets of less than \$1 billion. For each group, we present means and standard errors for all of our variables, along with the differences between the means of the large and small banks, and t-tests on those differences. As can be seen, there are significant differences with respect to *Loan Approved* (small banks approve more of their applicants), *ln(Firm Size)* (large banks tend to receive loan applications from larger firms), *Cash-to-Assets* (large banks receive loan applications from more liquid firms), *ln(Loan Amount)* (large banks receive larger loan requests), *Deposit Relationship* (applicants to small banks are more likely to have a pre-existing deposit account at that bank), *Loan Relationship* (applicants to small banks are more likely to have a pre-existing loan at that bank), *Length of Relationship* (applicants to small banks tend to have had longer prior relationships with the bank), and *ln(Bank Assets)* (large banks are, indeed, larger), and *SIC 7* and *SIC 8* (small banks are more likely to receive loan applications from business services firms, while large banks are more likely to receive loan applications from professional services firms). It is noteworthy that pre-existing relationships do seem to matter more for the applicants to small banks.

These differences in the applicant pools may well influence the overall pattern of accept/reject decisions observed for the two groups of banks. Consequently, not only must we control for the usual possibility of confounding influences through regression analysis, but we must also control for the potential bias that might be introduced by

the applicant firm's choice of a large bank or a small bank. We accomplish this by estimating a separate but simultaneous equation that explains the applicant firm's choice of size of bank to which it applies.

Empirical Results (Section IV)

The formal empirical tests of the hypotheses developed in Sections II and III consist of regressions in which *Loan Approved*—the 1,0 variable indicating whether a specific small business's loan application at a specific bank was approved or rejected by that bank—is the dependent variable and the remaining variables described in Section III are the right-hand side independent variables. We are especially interested in differences in loan approve/reject behavior displayed by large and small banks. As was discussed at the end of the previous section, however, the loan applicant's choice of bank may influence the observed patterns of banks' behavior. Consequently, we also estimate an equation that explains the applicant firm's selection decision to apply at a large bank or a small bank.

We use a bivariate probit model to correct for sample selection bias. This full information maximum likelihood (FIML) procedure involves the simultaneous estimation of two probit equations: (i) the firm's decision to apply at a big bank or a small bank; and, (ii) the bank's decision to accept or deny the firm's loan application, conditional on the type of bank to which the firm applied (see Greene, 1993 for details about this estimator).

In Table III, we present the results from the accept/reject equation estimated using the bivariate probit model. We estimate the model three times, once for the full sample of 1,102 banks, once for the selected sample of 517 "large" banks (with assets of \$1 billion or more), and once for the selected sample of 585 "small" banks (with assets less than \$1 billion).¹¹

In Appendix Table II, we present the results from the selection equations that explain the applicant firm's decision to apply for credit at a large bank or small bank. As noted previously, the selection equations were estimated simultaneously with the credit allocation equation using a bivariate probit model. Descriptive statistics for Census Region variables included in the big/small bank selection equation but not in the credit allocation equation are available from the authors upon request. Because we estimate the selection equation primarily to control for possible sample selection bias, we do not discuss these Appendix tables in detail.

All Banks

Turning first to the full sample, we find that the hypotheses of Section III are generally supported by the empirical results shown in Panel A

of Table III. With respect to the characteristics of the applicant firm, the coefficients of $\ln(\text{Firm Size})$ and $\ln(\text{Firm Age})$ are positive and significant at better than the 0.01 level, indicating banks are significantly more likely to approve the loan applications of larger firms and older firms. The number of delinquencies by the firm (*Firm Delinquencies*) and by the firm's primary owner (*Owner's Delinquencies*) are negative and significant, as expected, indicating that banks are less likely to approve loan applications from firms with poor credit histories. The dummy variables indicating applicant firms in *SIC 3* (light manufacturing), *SIC 6* (insurance and real estate), and *SIC 8* (professional services) are positive and significant at better than the 0.10 level, indicating that banks are more likely to extend credit to firms in those industries.

With respect to the characteristics of the requested loan, the coefficient on *Loan Amount* is negative while the coefficient on *Collateralized Loan* is positive, and both are significant at better than the 0.01 level. These findings are consistent with our hypotheses that banks are less likely to approve larger loans and more likely to approve collateralized loans.

With respect to the relationship variables, none of the variables indicating pre-existing relationship are significant at even the 0.10 level. However, the number of other sources of financial services (*Number of Sources*) is negative as hypothesized, and significant at better than the 0.01 level. This finding indicates that banks are less likely to extend credit to firms with multiple firm-creditor relationships. The coefficient on $\ln(\text{Bank Assets})$ is negative and significant at better than the 0.01 level. Hence, our results based upon micro-level data confirm the results of many other studies based upon macro-level data: large banks are less inclined to make loans to small businesses than are small banks.

Overall, the general hypotheses developed in Sections II and III hold up quite well in this regression. While we are unaware of any straightforward way of showing the overall significance of this regression, which was estimated jointly with the firm's decision to apply at a large or small bank, we have included in Panel A of Appendix Table I the identical specification estimated using a single-equation probit model rather than the bivariate probit model with selection. It is worth noting that the coefficient magnitudes and *t*-statistics for the simultaneous FIML probit equation of Table III and the single-equation probit of Appendix Table I are quite similar; and the latter equation easily passes a chi-squared test for significance.

Comparing Large and Small Banks

Panel B and Panel C of Table III report the results from estimating the credit allocation decision of large banks (with assets greater than \$1 billion) and of small banks (with assets less than \$1 billion), respectively. (Again, we present the results for the corresponding selection

equation that explains the loan applicant's decision to apply at a large or small bank in Appendix Table II.) Rather than discuss the results for the large-bank and small-bank regressions separately, we will discuss each variable and compare the coefficients in the large bank and small bank regressions. Panel D of Table III contains the results from t-tests for significant differences in the large-bank and small-bank coefficients.

ln(Firm Size): The coefficient is positive and significant at better than the 0.01 level in both the large-bank and small-bank regressions, indicating that both large banks and small banks are more likely to approve loan requests from larger firms. The difference between the two regression coefficients is insignificant.

ln(Firm Age): The coefficient is positive and significant at better than the 0.10 level in both regressions, indicating that both large and small banks are more likely to extend credit to older firms. Again, the difference in coefficients is insignificant.

ROA: The coefficient is small and insignificant in both regressions. Apparently, banks of both sizes place little faith in the historical profitability data as an indication of the creditworthiness of a prospective borrower.

Debt-to-Assets: For large banks, the coefficient is negative and significant at better than the 0.10 level, but is positive and insignificant for small banks. The difference in the two coefficients is significant at better than the 0.10 level. The significant negative relationship is the one that would normally be expected. But smaller banks' indifference toward leverage may well reflect the superior non-formal and non-financial information that a smaller bank is likely to possess about its loan applicants, whereas the large banks are hewing closer to decisions that are driven "by the numbers."

Cash-to-Assets: For large banks, the coefficient is positive and significant at better than the 0.05 level, but is negative and insignificant for small banks. The difference in the two coefficients is significant at better than the 0.05 level. The significant positive relationship is the one that would normally be expected. Again, this evidence suggests that large banks are "going by the numbers," while small banks are indifferent to the applicant's cash position, possibly reflecting the superior non-formal information that small banks have about their borrowers.

Firm Delinquencies: For small banks, the coefficient is negative and significant at better than the 0.05 level, but is negative and insignificant for large banks. The magnitude of the small-bank coefficient is more than ten times that of the large bank coefficient, and this difference in magnitude is significant at better than the 0.05 level. These results imply that small banks are quite sensitive to the applicant firm's credit history while large banks are not.

Owner's Delinquencies: The coefficients are negative for both groups of banks, but only the coefficient for the small banks is significant at

better than the 0.10 level. However, the difference in the coefficients is not significant. Again, it is the small banks that as a group are sensitive to the credit history.

African-Am Owner: The coefficient is negative and significant for large banks but positive and insignificant for small banks. The difference is significant at better than the 0.10 level. While one might interpret these results as evidence of racial discrimination by large banks, in the bureaucratized environment of the large banks, this interpretation seems unlikely. Moreover, it is at odds with theory, which suggests that discrimination would be more likely at small banks. A more plausible interpretation is that this variable is a proxy for the owner's personal wealth, income, and credit history, which are known to the bank by way of commercially available credit reporting agencies such as Equifax and TRW. The large banks are sensitive to these numbers, while the small banks are more concerned with the "character" of the borrower and look past them.

ln(Loan Amount): For small banks, the coefficient is negative and significant at better than the 0.01 level but is negative and insignificant for large banks. The coefficient in the small-bank regression is more than four times as large as that in the large-bank regression, and this difference in magnitude is significant at better than the 0.10 level. Hence, the evidence supports the hypothesis that small banks are more constrained by diversification and regulatory requirements.

Collateralized Loan: The coefficient is positive for both groups, and is significant at better than the 0.05 level for the large banks. The difference in coefficients is small and insignificant ($t = -0.19$).

Deposit Relationship: The coefficient is negative and insignificant for large banks but is positive and significant at better than the 0.05 level for small banks. The difference in coefficients is significant at better than the 0.05 level. These findings suggest that small banks, but not large banks, favor an applicant that has had a pre-existing deposit relationship with the bank. These results strongly support Nakamura (1993), who argues that small banks are best able to use the information that is yielded by a borrower's deposit account for monitoring purposes.

Loan Relationship: The coefficient is positive and insignificant for large banks but is negative and significant at better than the 0.01 level for small banks. The difference in coefficients is significant at better than the 0.05 level. These results suggest that small banks are constrained to a greater extent than large banks in their ability to extend additional credit to existing loan customers.

Financial Mgt. Relationship: The coefficient is positive for small banks and negative for large banks, but is insignificant for both groups. Apparently, this type of prior relationship does not yield useful information for either category of bank.

Length of Relationship: The coefficient is insignificant for both groups. As was true for Cole (1998), only recent information appears to be important. The length of the applicant's relationship with a bank of either size is irrelevant, after controlling for the existence of a relationship.

Number of Sources: The coefficient is negative for both groups and is significant at better than the 0.05 level for large banks. The difference in coefficients is quite small and insignificant.

ln(Bank Assets): The coefficient is negative and significant at better than the 0.01 level for both groups of banks, but the difference in coefficients is insignificant. Hence, the tendency of larger banks to be less interested in making loans to small business applies not only to the entire sample, but also to the variation in size within each sub-sample.

SIC 2–SIC 8: Large banks are significantly more likely to approve loan applications from firms in the retail trade (*SIC 5b*), insurance and real estate (*SIC 6*), business services (*SIC 7*), and professional services (*SIC 8*) industries. By contrast, small banks are significantly less likely to approve loan applications from firms in the retail trade (*SIC 5b*) and professional services (*SIC 8*) industries. The differences in the coefficients of the two groups of banks are significant at better than the 0.05 level for the retail trade (*SIC 5b*), business services (*SIC 7*), and professional services (*SIC 8*) industries.

We are unaware of a straightforward way to perform the equivalent of a Chow test for results from these bivariate probit regressions, which could indicate whether the large bank and small bank regressions come from the same common model. However, in Appendix Table I, we present single equation probit regressions for the large banks and small banks that use the same explanatory variables as are found in Table III. As can be seen, the coefficients and statistics in Appendix Table I and in Table III are quite similar. For the single equation probit regressions shown in Appendix Table I, a log-likelihood test (chi-squared) can be performed on the separate large bank and small bank probit regressions and the full sample probit regression. The results of such a test indicate the null hypothesis that the large bank and small bank regressions came from the same common model can be rejected at a 95% confidence level. Given the similarity of coefficients and *t*-statistics, it seems likely that the same would be true for results obtained using the bivariate probit model and shown in Table III.

A Summing Up

The regression analyzing the credit allocation decisions for the sample of banks does a quite respectable job of explaining the banks' decisions to extend or deny credit in terms of the general hypotheses. However, the results for the full sample mask important differences between large banks and small banks in the criteria that they appear

to use in approving or rejecting loan applications. The two separate regressions for large banks and for small banks demonstrate a number of significant and important differences. These results show that large banks, but not small banks, are less likely to extend credit to firms with greater leverage and to minority-owned firms (a likely proxy for the owner's wealth, income, and credit history), and are more likely to extend credit to firms with greater cash reserves. Small banks appear to be willing to look past the potential problems of leverage, small amounts of cash on hand, and the owner's minority status. Further, the small banks, but not large banks, are more likely to extend credit to firms with which they had pre-existing deposit relationships, and are less likely to extend credit to firms with which they had pre-existing loan relationships. Small banks are also less likely to extend credit to firms asking for larger loan amounts. Finally, large banks and small banks have different approval proclivities with respect to loan applications from firms in various industry categories.

In sum, our findings support the hypotheses that large banks and small banks use different criteria in their decisions to extend or deny credit to small businesses, even when the applicants' decisions as to whether to apply to a large bank or a small bank have been taken into account. The criteria used by large banks appear to be more in line with standard expectations (with the possible exception of large banks' apparent insensitivity to the recent delinquencies of the applicant firm and its owners). By contrast, small banks' apparent criteria are less standard (they do not react negatively to greater leverage by an applicant or positively to cash on hand), and they are positively sensitive to an applicant firm's prior deposit relationship. The large banks' criteria are more consistent with a "by-the-numbers" approach to making small business loans. The results are likely to be "cookie-cutter" loans. By contrast, the results indicate that small banks are less guided by the standard formal numbers, and are consistent with a "character" approach to making small-business loans.

Conclusion and Implications (Section V)

In this study, we provide empirical evidence that large banks and small banks differ in their approach to making small-business loans. In general, large banks employ a "cookie-cutter" approach to small-business lending in order to control for agency problems and to maintain consistent loan standards throughout the bank's offices. Small banks, in contrast, rely more upon "character" and pre-existing relationships, and pay less attention to formal financial variables. Small banks face less of an agency problem and have superior knowledge about their small-business borrowers. Thus, small banks find it more advantageous than large banks to use a more discretionary approach.

In the current environment of rapid consolidation of the banking system this difference in lending approach can have major implications. As banks consolidate, information about small business customers is lost. The empirical evidence indicates that large banks are less likely to extend credit to small business. In order to compensate for this reduction of credit to small business, the creation of de novo banks, which have been shown to lend more to small business than similar sized incumbent banks, may be needed. Indeed, anecdotal evidence suggests that community leaders and displaced bank officers often organize and charter new, small banks when local depositories are taken over by large non-local banks.

This study only deals with the extension or denial of small-business loan requests; it does not address the terms of the loans that are extended, such as the interest rates or collateral requirements. If large banks are less likely to extend credit to small businesses than are small banks, small firms must expect to receive better terms from large banks than small banks. These factors need to be examined with respect to the different approaches between large and small banks in small business lending in order to obtain a full picture of the lending process. We leave the analysis of these factors to future research.

Rebel A. Cole is CEO of Krahenbuhl Financial Consulting. His work focuses on the development and implementation of bank early warning systems for developing countries. His publications have appeared in the Journal of Finance, Journal of Financial Economics, Journal of Banking and Finance, and Journal of Regulatory Economics. Cole has a Ph.D. from the University of North Carolina at Chapel Hill.

Lawrence G. Goldberg is a professor of finance at the University of Miami. His main areas of research have been financial institutions, international finance, health economics and industrial organization. He has published extensively in academic journals such as the Journal of Finance, Journal of Money, Credit and Banking, and Journal of Banking and Finance. Goldberg has a Ph.D. from University of Chicago.

Lawrence J. White is the Arthur E. Imperatore Professor of Economics at New York University's Stern School of Business. He is the author of several books, including Reforming Regulation: Processes and Problems (1981) and The S&L Debacle: Public Policy Lessons for Bank and Thrift Regulation (1991). White has a B.A. from Harvard, an M.S. from the London School of Economics and a Ph.D. from Harvard.

TABLE I
Small Business Survey Sample Variable Definitions and Summary Characteristics

Variable	Label	Mean	Std. Error	Minimum	Maximum
(1)	(2)	(3)	(4)	(5)	(6)
<i>Firm Financial Characteristics</i>					
Firm Size	Annual sales (\$000)	997	47	0	9,909
Firm Age	Age of the firm (Years)	13.15	0.31	1	103
ROA	Profit divided by assets	0.65	0.04	-1.00	5.00
Debt-to-Assets	Total debt divided by assets	0.60	0.01	0.00	1.60
Cash-to-Assets	Cash divided by assets	0.17	0.01	-0.48	1.00
Firm Delinquencies	Number of business delinquencies in last three years (3 maximum)	0.61	0.03	0	3
Owner's Delinquencies	Number of owner's delinquencies in last three years (3 maximum)	0.31	0.03	0	3
African-Am. Owner	Firm's primary owner is self-identified as African-American	0.015	0.01	0	1
<i>Loan Characteristics</i>					
Loan Approved	Loan request was approved by the bank to which it applied for credit	0.83	0.01	0	1
Loan Amount	Amount of the firm's loan request (\$000)	163	14	1	6,700
Collateralized Loan	Loan's intended use was to finance motor vehicle, equipment, building, or working capital	0.87	0.01	0	1
<i>Relationship Characteristics</i>					
Deposit Relationship	Firm has deposit account with bank (checking or saving)	0.81	0.01	0	1
Loan Relationship	Firm has another loan from bank	0.42	0.01	0	1
Financial Service Relationship	Firm obtains financial management services from bank	0.31	0.01	0	1
Length of Relationship	Length of relationship with bank to which the firm applied for credit (Years)	7.80	0.22	0	40
Number of Sources	Number of other sources for financial services	1.42	0.04	0	10
Bank Assets	Assets (\$Millions) of bank to which the firm applied for credit	6,519	555	11	175,720
<i>Standard Industrial Classification</i>					
SIC 1	Firm's primary SIC is Construction and Mining	0.16	0.01	0	1
SIC 2	Firm's primary SIC is Heavy Manufacturing	0.04	0.01	0	1
SIC 3	Firm's primary SIC is Light Manufacturing	0.05	0.01	0	1
SIC 4	Firm's primary SIC is Transportation	0.03	0.01	0	1
SIC 3a	Firm's primary SIC is Wholesale Trade	0.12	0.01	0	1
SIC 5b	Firm's primary SIC is Retail Trade	0.23	0.01	0	1
SIC 6	Firm's primary SIC is Insurance and Real Estate	0.06	0.01	0	1
SIC 7	Firm's primary SIC is Business Services	0.16	0.01	0	1
SIC 8	Firm's primary SIC is Professional Services	0.16	0.01	0	1

For each variable identified in column 1, column 2 presents the variable's definition and columns 3-6 present the variable's mean, standard error, minimum value, and maximum value, respectively, for all 1,102 firms in the sample that applied for a bank loan.

TABLE II

Description Statistics for the Large-Bank and Small-Bank Sub-Samples

For each variable in column 1, columns 2 and 3 (4 and 5) present the mean and standard error based upon the large-bank (small-bank) sub-samples. In column 6 are the differences in the large-bank and small-bank means and in column 7 are the results of t-tests for statistically significant differences in the large-bank and small-bank means. a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Variable	Large-Bank Sub-Sample (n = 517)		Small-Bank Sub-Sample (n = 585)		Difference in Large-Bank and Small-Bank Means	
	Mean	Std. Err.	Mean	Std. Err.	Difference	t-statistic
<i>Firm Financial Characteristics</i>						
Firm Size (Annual Sales, \$000)	1,181	78	861	58	321	3.31 a
Firm's Age (Years)	13.06	0.42	13.22	0.44	-0.16	-0.26
ROA	0.71	0.07	0.60	0.05	0.11	1.30
Debt-to-Assets	0.58	0.02	0.61	0.02	-0.03	-1.19
Cash-to-Assets	0.19	0.01	0.15	0.01	0.04	2.53 b
Business Delinquencies	0.62	0.05	0.61	0.05	0.01	0.07
Owner's Delinquencies	0.31	0.04	0.30	0.04	0.01	0.13
African-Am. Owner	0.01	0.01	0.02	0.01	-0.01	1.39
<i>Loan Characteristics</i>						
Loan Approved	0.76	0.02	0.89	0.01	-0.13	-5.59 a
Loan Amount (\$000)	244	28	104	10	140	4.67 a
Collateralized Loan	0.85	0.02	0.88	0.01	-0.03	-1.28
<i>Relationship Characteristics</i>						
Deposit Relationship	0.79	0.02	0.84	0.02	-0.05	-2.08 b
Loan Relationship	0.33	0.02	0.49	0.02	-0.16	-5.47 a
Financial Service Relationship	0.33	0.02	0.29	0.02	0.04	1.34
Length of Relationship (Years)	7.00	0.30	8.40	0.32	-1.40	-3.19 a
Number of Sources	1.48	0.06	1.38	0.06	0.10	1.17
Bank Assets (\$Millions)	15,027	1,091	225	9	14,802	13.57 a
<i>Standard Industrial Classification</i>						
SIC 1 Construction and Mining	0.17	0.01	0.16	0.01	0.01	0.56
SIC 2 Heavy Manufacturing	0.04	0.01	0.03	0.01	0.01	1.10
SIC 3 Light Manufacturing	0.04	0.01	0.05	0.01	-0.01	-0.72
SIC 4 Transportation	0.03	0.01	0.03	0.01	0.01	0.48
SIC 5a Wholesale Trade	0.11	0.01	0.12	0.01	-0.02	-0.80
SIC 5b Retail Trade	0.21	0.01	0.24	0.01	-0.02	-0.96
SIC 6 Insurance and Real Estate	0.06	0.01	0.06	0.01	0.01	0.46
SIC 7 Business Services	0.14	0.01	0.18	0.01	-0.04	-1.88 c
SIC 8 Professional Services	0.19	0.01	0.13	0.01	0.06	2.82 a

TABLE III
Results from Bivariate Probit Selection Model to Explain the Small-Business
Credit Allocation Decision of Large Banks and Small Banks

	Panel A: All Banks		Panel B: Large Banks		Panel C: Small Banks		Panel D t-test
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	
Results from Bivariate Probit Selection Model to Explain the Small-Business Credit Allocation Decision of Large Banks and Small Banks							
In Panel A, the full sample of 1,102 observations is used in estimation of bank's decision to extend or deny credit, simultaneous with the firm's decision to apply for credit at a large bank or a small bank. In Panel B (Panel C), the selected sample of 517 large banks (385 small banks) is used in estimation of the bank's decision to extend or deny credit, simultaneous with the firm's decision to apply for credit at a large bank (small bank). Results for the firm's decision to apply for credit at a large or small bank appear in Appendix Table I. For each variable identified in column 1, the panels present the variable's estimated coefficient and t-statistic. In panel D is the result of a t-test for significant differences in the large-bank and small-bank coefficients. a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.							
<i>Firm Financial Characteristics</i>							
Constant	-0.17	-0.20	-1.22	-0.73	3.23	1.70	-1.76 c
ln (Firm Size)	0.36	6.65 a	0.41	5.03 a	0.41	3.90 a	0.05
ln (Firm Age)	0.36	3.52 a	0.31	1.92 c	0.43	2.40 b	-0.31
ROA	0.02	0.32	-0.04	-0.57	0.09	0.86	-1.03
Debt-to-Assets	-0.08	-0.62	-0.30	-1.76 c	0.22	0.85	-1.68 c
Cash-to-Assets	0.21	0.87	0.68	1.99 b	-0.71	-1.35	2.21 b
Firm Delinquencies	-0.12	-2.16 b	-0.02	-0.21	-0.29	-2.85 a	2.07 b
Owner's Delinquencies	-0.19	-2.99 a	-0.17	-1.45	-0.21	-1.89 c	0.29
African Am. Owner	-0.37	-0.86	-1.65	-1.98 b	0.13	0.22	-1.74 c
<i>Loan Characteristics</i>							
ln (Loan Amount)	-0.13	-2.86 a	-0.07	-1.05	-0.29	-3.11 a	1.91 c
Collateralized Loan	0.44	2.75 a	0.45	1.97 b	0.38	1.27	0.19
<i>Relationship Characteristics</i>							
Deposit Relationship	0.02	0.14	-0.24	-0.98	0.62	2.19 b	-2.30 b
Loan Relationship	-0.21	-1.59	0.12	0.58	-0.77	-2.60 a	2.47 b
Financial Mgt. Relationship	0.17	1.29	-0.02	-0.10	0.41	1.42	-1.25
ln (Length of Relationship)	0.00	-0.01	-0.03	-0.27	0.04	0.23	-0.34
Number of Sources	-0.16	-3.38 a	-0.14	-2.05 b	-0.12	-1.57	-0.15
ln (Bank Assets)	-0.21	-4.94 a	-0.22	-2.92 b	-0.36	-2.74 a	0.89
<i>Standard Industrial Classification</i>							
SIC 2 Heavy Manufacturing	-0.01	-0.03	0.18	0.54	-0.43	-0.60	0.78
SIC 3 Light Manufacturing	0.51	1.82 c	0.39	0.94	-0.26	-0.45	0.92
SIC 4 Transportation	0.26	0.67	0.23	0.33	0.33	0.42	-0.11
SIC 5a Wholesale Trade	0.05	0.21	-0.06	-0.20	-0.58	-1.15	0.87
SIC 5b Retail Trade	0.08	0.42	0.58	2.14 b	-0.78	-1.81 c	2.67 a
SIC 6 Insurance and Real Estate	0.61	2.23 b	0.86	2.34 b	0.05	0.09	1.17
SIC 7 Business Services	0.35	1.63	0.79	2.56 b	-0.40	-0.94	2.28 b
SIC 8 Professional Services	0.35	1.72 c	1.08	3.62 a	-0.95	-2.19 b	3.87 a

Notes

- ¹ Our description of the loan-approval process that we expect to find in large banks has somewhat the flavor of credit scoring. Though the time period studied in the empirical section of this paper precedes the announced use of credit scoring methods for small-business loans by large banks, credit scoring had already been in widespread use for residential mortgage loans and household credit-card loans. It is a process for standardizing lending decisions in ways that would be especially appealing to the bureaucratic/managerial needs of large banks. For a further discussion of credit scoring, see Mester (1997).
- ² For a detailed description of the 1993 NSSBF, which was used by Cole (1998), see Cole and Wolken (1995). For a description of the 1987 NSSBF, which was used by Petersen and Rajan (1994, 1995) and Berger and Udell (1995), see Elliehausen and Wolken (1989).
- ³ All observations have been weighted, so as to make the sample representative of the universe of small business enterprise. Thus, the reported means are weighted, and all of the reported regressions employ these weights for each observation.
- ⁴ For all variables that are used in log form, we have added 1.0 to all observations to allow us to deal with values of zero.
- ⁵ To control for erroneous extreme values, this ratio was limited to values in the range of 0.0 to 1.6.
- ⁶ The survey capped the magnitude of this variable (and of *Owner's Delinquencies*, described below in the text) at three. The possible answers to the survey question were: zero, one, two, or three or more delinquencies.
- ⁷ SIC code 1, covering mining and construction, is the base case, so this variable is excluded from the explanatory variables included in the regressions. SIC 5 is separated into two variables, wholesale trade firms and retail trade firms.
- ⁸ These restrictions, often described as the "loans to one borrower" regulations, generally restrict a bank to making loans that individually are no larger than 15% of the bank's capital (net worth). For a typical small bank with \$100 million in assets and a 5 percent net-worth ratio, this implies a maximum loan amount of \$750,000.
- ⁹ Transaction services encompass the provision of paper money and coins, the processing of credit card receipts, the collection of night deposits, and wire transfers. Cash management services include the provision of sweep accounts, zero-balance accounts, lockbox services, and other services designed to invest liquid funds in liquid, interest-bearing assets automatically. Credit-related services include the provision of bankers' acceptances, letters of credit, and factoring. Trust services include the provision of 401(k) plans, pension funds, business trusts, and securities safekeeping.
- ¹⁰ In an earlier draft of this study, we also examined two other bank variables. One was the ratio of the bank's "tier 1" capital to its risk adjusted assets, in the expectation that capital-constrained banks would be less inclined to approve loans. However, virtually none of the banks were at or near the regulatory capital minimum levels, and the variable consistently showed no effect. The other variable was the age of the bank, because DeYoung et al., (1998) have shown that de novo banks tend to lend less to small business as they grow older. However,

almost all of the banks in our sample were older than 20 years, the cut-off point for an age effect in the DeYoung et al. study. Consequently, we dropped both variables.

- ¹¹ In Appendix Table I, we present a similar set of simple probit equations that do not embody the simultaneous choice by the applicant of a large or small bank. A comparison of the results for the accept/reject equation estimated using the bivariate probit model, shown in Table III, and those obtained using a simple probit model, shown in Appendix Table I, reveals that the two sets of results are quite similar.

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APPENDIX TABLE 1
 Results from Binary Probit Model to Explain the Small-Business Credit Allocation Decision of Large Banks and Small Banks

Appendix Table 1
Results from Binary Probit Model to Explain the Small-Business Credit Allocation Decision of Large Banks and Small Banks

In Panel A, the full sample of 1,102 observations is used in estimation of bank's decision to extend or deny credit. In Panel B (Panel C), the selected sample of 383 small banks (517 large banks) is used in estimation of the bank's decision to extend or deny credit. For each variable identified in column 1, the panels present the variable's estimated coefficient and t-statistic. In panel D is the result of a t-test for significant differences in the large-bank and small-bank coefficients. a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

	Panel A: All Banks		Panel B: Large Banks		Panel C: Small Banks		Panel D
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	
Constant	-0.36	-0.59	-1.27	-1.03	3.38	2.28	-2.41 b
<i>Firm Financial Characteristics</i>							
ln (Firm Size)	0.36	7.33 a	0.41	5.72 a	0.42	5.06 a	0.02
ln (Firm Age)	0.36	3.76 a	0.30	2.31 b	0.42	2.66 b	-0.56
ROA	0.01	0.34	-0.04	-0.74	0.10	1.10	-1.33
Debt-to-Assets	-0.08	-0.63	-0.30	-1.91 c	0.27	1.31	-2.20 b
Cash-to-Assets	0.19	0.83	0.68	2.29 b	-0.81	-1.91 c	2.88 a
Firm Delinquencies	-0.12	-2.40 b	-0.02	-0.24	-0.29	-3.45 a	2.48 b
Owner's Delinquencies	-0.19	-2.97 a	-0.17	-1.73 c	-0.22	-2.05 b	0.36
African Am. Owner	-0.38	-1.02	-1.66	-2.08 b	0.14	0.26	-1.86 c
<i>Loan Characteristics</i>							
ln (Loan Amount)	-0.14	-3.21 a	-0.08	-1.18	-0.31	-4.00 a	2.46 c
Collateralized Loan	0.45	3.21 a	0.45	2.36 b	0.44	1.90 c	0.02
<i>Relationship Characteristics</i>							
Deposit Relationship	0.02	0.14	-0.24	-1.11	0.62	2.50 b	-2.62 a
Loan Relationship	-0.21	-1.82 c	0.12	0.74	-0.80	-3.78 a	3.49 a
Financial Mgt. Relationship	0.17	1.37	0.02	0.12	0.43	1.90 c	-1.61
ln (Length of Relationship)	0.00	-0.02	-0.03	-0.31	0.05	0.35	-0.47
Number of Sources	-0.15	-3.94 a	-0.14	-2.49 b	-0.14	-2.03 b	-0.08
ln (Bank Assets)	-0.19	-7.77 a	-0.22	-3.41 a	-0.38	-3.54 a	1.28
<i>Standard Industrial Classification</i>							
SIC 2 Heavy Manufacturing	-0.01	-0.04	0.18	0.52	-0.45	-0.79	0.92
SIC 3 Light Manufacturing	0.51	1.74 c	0.39	0.96	-0.20	-0.40	0.91
SIC 4 Transportation	0.25	0.77	0.23	0.58	0.31	0.47	-0.10
SIC 5a Wholesale Trade	0.05	0.24	-0.06	-0.24	-0.53	-1.31	0.96
SIC 5b Retail Trade	0.08	0.47	0.58	2.51 b	-0.76	-2.22 b	3.24 a
SIC 6 Insurance and Real Estate	0.60	2.31 b	0.86	2.65 a	0.06	0.11	1.26
SIC 7 Business Services	0.35	1.87 c	0.79	3.03 a	-0.37	-1.06	2.66 a
SIC 8 Professional Services	0.34	1.86 c	1.09	4.34 a	-1.00	-2.87 a	4.77 a
Pseudo R-square	0.229		0.194		0.372		

APPENDIX TABLE II

Results from Bivariate Probit Selection Model to Explain the Decision
of Small Firms to Apply for Credit at a Large or Small Bank

The full sample of 1,102 observations is used in estimation of the firm's decision to apply for credit at a large bank or a small bank, simultaneous with estimation of the bank's decision to extend or deny the firm's application. In Panel A, the application decision is estimated jointly with the decision by the full sample of 1,102 banks to extend or deny credit. In Panel B (Panel C), the application decision is estimated jointly with decision by the sample of 585 small banks (517 large banks) to extend or deny credit. Results for the banks' decision to extend or deny credit appear in Table III. For each variable identified in column 1, the panels present the variable's estimated coefficient and t-statistic. a, b, and c indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Variable	Panel A		Panel B		Panel C	
	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-1.34	-3.17 a	1.34	3.13	-1.34	-3.17
<i>Firm Financial Characteristics</i>						
Firm Size	0.07	2.09 b	-0.07	-1.95 c	0.07	1.98 b
Debt-to-Assets	-0.12	-1.29	0.12	1.23	-0.12	-1.24
Cash-to-Assets	0.40	2.32 b	-0.40	-2.14 b	0.40	2.16 b
<i>Loan Characteristics</i>						
Loan Amount	0.04	1.30	-0.04	-1.27	0.04	1.27
Collateralized Loan	-0.31	-2.49 b	0.31	2.30 b	-0.31	-2.39 b
Number of Sources	-0.05	-1.89 c	0.05	1.87 c	-0.05	-1.92 c
<i>Standard Industrial Classification</i>						
SIC 2 Heavy Manufacturing	0.22	0.96	-0.22	-0.98	0.22	0.95
SIC 3 Light Manufacturing	-0.28	-1.28	0.28	1.16	-0.28	-1.18
SIC 4 Transportation	0.03	0.11	-0.03	-0.11	0.03	0.11
SIC 5a Wholesale Trade	-0.25	-1.56	0.25	1.45	-0.25	-1.46
SIC 5b Retail Trade	-0.18	-1.36	0.18	1.34	-0.18	-1.33
SIC 6 Insurance and Real Estate	0.18	0.92	-0.18	-0.86	0.18	0.85
SIC 7 Business Services	-0.05	-0.35	0.05	0.32	-0.05	-0.35
SIC 8 Professional Services	0.16	1.11	-0.15	-1.05	0.16	1.10
<i>Census Region</i>						
Region 2 Middle Atlantic	-0.36	-1.86 c	0.35	1.71	-0.36	-1.69 c
Region 3 East North Central	0.94	6.16 a	-0.94	-6.18 a	0.94	6.19 a
Region 4 West North Central	0.41	2.48 b	-0.44	-2.55 b	0.42	2.41 b
Region 5 South Atlantic	0.46	2.40 b	-0.44	-2.18 b	0.46	2.25 b
Region 6 East South Central	0.64	4.36 a	-0.63	-4.24 a	0.64	4.28 a
Region 7 West South Central	0.53	3.92 a	-0.53	-3.88 a	0.53	3.87 a
Region 8 Mountain	-0.48	-2.96 a	0.49	3.01 a	-0.48	-2.89 a
Region 9 Pacific	-0.43	-2.60 a	0.44	2.61 a	-0.44	-2.54 a
Correlation between error terms of bivariate probit equations			-0.34	-0.71	-0.02	-0.07

THE “BIG PICTURE” ABOUT RELATIONSHIP-BASED FINANCE

Discussion Comments

Allen N. Berger

*Board of Governors of the Federal Reserve System
Wharton Financial Institutions Center*

This session is about the topic of relationship lending by commercial banks, but to look at the “Big Picture” we discuss an even bigger concept, “relationship-based finance,” of which relationship lending by banks is but one component. We define relationship-based finance as occurring when the following three conditions are met:

- (1) Information is gathered by the provider of funds beyond the relatively transparent data available in the financial statements, observation of any collateral, and other public information;
- (2) Information is gathered through continuous contact between the provider and the firm, its owner, the firm’s customers, and the local community, etc., often through the provision of multiple financial services;
- (3) Information remains confidential to the provider of funds, who uses the information to help make additional decisions over time about future injections of capital, the evolution of contract terms, or monitoring strategies.

Relationship-based finance is one of the major tools used to provide funding to informationally opaque small businesses who may otherwise have much higher capital costs or simply not qualify for sufficient external finance to continue operations. The information is often gathered through multiple contacts, not all of which involve the provision of finance (e.g., checking accounts, investment services, etc.), and not all of which are with the business itself. For many small businesses, the information gathered about the firm owner is often more important than the information about the firm, since the firm may have little track record or accumulated collateral. Contract terms, covenants, and contract renegotiations are often geared to releasing additional information over time.¹

At the opposite extreme of relationship-based finance is transactions-based finance, in which funds are provided on the basis of easily available information in financial statements, observation of collateral, and other public information around the time that the funds are provided. The funding is typically a one-time injection of funds, and there is little or no past relationship or information garnered from other accounts, and no setting of contract terms to reveal information to be used in future decisions. Transactions-based finance is best exemplified by the public stock and bond markets that fund relatively informationally transparent large businesses in which there is typically very little contact between the provider of the funds and the business being funded.

Relationship-based finance more often applies to the funds provided in the private equity and private debt markets that fund relatively informationally opaque small businesses. In these markets, there is typically a considerable amount of contact between the provider of the funds and the business being funded. For example, venture capitalists that provide equity financing maintain an important relationship with the firm and gather information through frequent visits to the firm. They use this information in: 1) helping make managerial decisions; 2) choosing whether to inject more funds; and 3) deciding whether and when the firm should go public. Trade creditors that provide debt financing may also gain private information about the small business' industry, production process, and financial health from continuous contact, and use this information to decide on credit and price terms.

Commercial banks often establish relationships with small businesses through multiple types of contact and reuse the information in their lending decisions. Lines of credit issued by commercial banks often represent continuous, exclusive relationships which provide information over time to the bank, often in conjunction with checking accounts and the handling of accounts receivable. Typically, small businesses have only one bank providing their lines of credit, and the small businesses may be asked to move their checking accounts and other business to that bank. Commercial banks also specialize in designing contract terms, establishing covenants, and renegotiating contracts—activities that reveal further information over time.

However, relationship-based finance does not apply well to all types of private equity and debt. For example, mortgages, equipment loans/leases, and motor vehicle loans are usually one-time extensions of credit based significantly on the value of pledged collateral. Small businesses often obtain these types of finance from different intermediaries. Thus, even for commercial banks, some of the credit supplied to small business is relationship-based and some is transactions-based.²

The Focus on Relationship Lending by Commercial Banks

Relationship-based finance is more general than the commonly discussed concept of relationship lending by commercial banks because it applies to equity financing as well as debt financing, and it also applies to nonbank intermediaries (e.g., venture capitalists) and other providers of funds (e.g., trade creditors) as well as banks. Nonetheless, there is a strong research and policy focus on relationship lending by commercial banks for several reasons. Banks are the largest single supplier of external finance to small businesses in the U.S., supplying about 19% of total finance or about 37% of total debt finance. Although only about 41% of small businesses have any bank loans, almost all firms have bank checking accounts, and about 87% identify a commercial bank as their primary financial institution. Small businesses also tend to have long relationships with their banks, almost 8 years on average.³ Perhaps the most important research and policy issue regarding relationship lending to small businesses by commercial banks concerns the potential effects of banking industry consolidation on lending to relationship-dependent, informationally opaque small businesses (discussed momentarily).

The empirical research on relationships between banks and small businesses generally supports the notions that banks use relationships to garner information and that small businesses benefit from these relationships. The research using U.S. data generally found that small businesses with stronger banking relationships received loans with lower rates and fewer collateral requirements; had less dependence on trade credit; enjoyed greater credit availability; and more protection against the interest rate cycle than other small businesses (Petersen and Rajan, 1994, 1995; Berger and Udell, 1995; Blackwell and Winters, 1997; Berlin and Mester, 1998; Cole, 1998; Hubbard, Kuttner, and Palia, 1998). The U.S. data also suggest that banks gather valuable private information from depositors, and in some cases use this information in credit decisions (Allen, Saunders, and Udell, 1991; Nakamura, 1993; Frieder and Sherrill, 1997; Mester, Nakamura, and Renault, 1998). The European and Asian data also usually support the value added of relationships, although some of the European evidence suggests exceptions (Hoshi, Kashyap, and Sharfstein, 1990; Ongena and Smith, 1997; Elsas and Krahnert, 1998; Harhoff and Körting, 1998; Angelini, Di Salvo, and Ferri, 1998).

The "Big" Issue—Bank Consolidation and Small Business Lending

As noted, an important research and policy issue concerns the potential effects of banking industry consolidation on lending to relationship-dependent, informationally opaque small businesses. The main

argument behind the issue of whether consolidation reduces the supply of credit to these businesses hinges on the issue of whether there is a significantly different technology used by banks in relationship-based lending versus transactions-based lending. The larger, more organizationally complex institutions created by consolidation may choose to provide less relationship-based credit to small customers because of Williamson-type (1967, 1988) organizational diseconomies of providing these services along with providing transactions-based wholesale capital market services to large customers. That is, it may be scope inefficient for one bank to produce outputs which require implementation of quite different policies and procedures. Relationship-based finance requires gaining intimate knowledge of the small business, its owner, and its local market over time through a relationship. Large, organizationally complex institutions may be inefficient at providing these relationship-based services along with transactions-based services. Similarly, there may be scale or organizational diseconomies in making relationship-based loans because of agency costs in monitoring relationship-based information generated by local loan officers in large, organizationally complex financial institutions.

There has been a substantial amount of recent empirical research on the effects of bank size and organizational complexity on the supply of credit to small businesses. A number of studies have shown that large banking organizations devote lesser proportions of their assets to small business loans than do small organizations (e.g., Berger, Kashyap, and Scalise, 1995; Keeton, 1995; Levonian and Soller, 1995; Berger and Udell, 1996; Peek and Rosengren, 1996; Strahan and Weston, 1996). As banks get larger, the proportion of assets devoted to small business lending (measured by domestic Commercial & Industrial loans to borrowers with bank credit less than \$1 million) declines sharply from about 9% of assets for small banks (assets below \$100 million) to less than 2% for very large banks (assets over \$10 billion). The effects of organizational complexity—measured by additional layers of management, operation in multiple states, being in more financial lines of business, etc.—are ambiguous (Keeton, 1995; Whalen, 1995; Berger and Udell, 1996; Berger, Saunders, Scalise, and Udell, 1998).

There has also been a substantial amount of recent empirical research on the effects of bank mergers and acquisitions (M&As) on the supply of credit to small businesses. The effects of bank M&As are not necessarily the same as the static effects of just increasing bank size and complexity—M&As may also involve dynamic changes in organizational focus or managerial behavior. A number of studies examined the effects of bank M&As on small business lending (Keeton, 1996,1997; Peek and Rosengren, 1996,1998; Strahan and Weston, 1996,1998; Craig and Santos, 1997; Kolari and Zardkoohi, 1997a,b;

Zardkoohi and Kolari, 1997; Walraven, 1997; Berger, Saunders, Scalise, and Udell, 1998; Sapienza, 1998). The most common findings are these M&As in which one or more of the banking organizations is large tend to reduce small business lending, whereas M&As between small organizations tend to increase small business lending, although there are exceptions. Since M&As involving large organizations dominate M&As in terms of assets, these studies suggest an aggregate net reduction in small business lending by the banks participating in M&As.

The *total* change in the supply of small business credit from M&As also depends on the reactions of other lenders, or the "external effect" of M&As. For example, if banks involved in M&As reduce their supply of relationship lending because of Williamson-type diseconomies, other bank or nonbank lenders that are not burdened by these diseconomies may react by picking up some or all of these credits. One study measured the external effect of M&As on the lending of other banks in the same local markets and found that changes in the supply of small business credit by these other banks tended to offset much, if not all, of the negative effects of M&A participants (Berger, Saunders, Scalise, and Udell, 1998). Part of the external effect may be from *de novo* entry, which has occurred at a torrid pace in recent years. Several studies found that *de novo* banks tend to lend more to small businesses than do other banks of comparable size (Goldberg and White, 1998; DeYoung, 1998; DeYoung, Goldberg, and White, 1999). However, the measured effects of M&As on the likelihood of *de novo* entry are mixed—one study found that M&As increase the probability of entry (Berger, Bonime, Goldberg, and White, 1999) and one study found that M&As decrease the probability of entry (Seelig and Critchfield, 1999).⁴

The Needed Research on Relationship Lending and Bank Consolidation

What is needed in this literature is a body of analysis that combines data from banks and small businesses. The relationship-lending literature has used detailed information on the borrowing firms—their risk, industry, size, proxies for informational opacity, etc. However, this research has generally had little information on the banks—their size, organizational complexity, and M&A activity. The bank consolidation literature has used detailed information on the banks, but generally has had little information on the borrowing firms. Given the research to date, the most informative new research on the effects of consolidation on small business lending would combine the two types of data to try to separate out demand and supply effects, and see if bank size, organizational complexity, and M&As are associated with reduced supply of credit to relationship-dependent, informationally opaque small businesses.

A limited amount of prior research has matched bank and small business information. One study found that large banks tend to charge about 100 basis points less on small business loans, and require collateral about 25% less often than small banks, other things equal (Berger and Udell, 1996). This is consistent with the view that large banks tend to issue small business loans to higher-quality transactions-based credits, rather than relationship-based loans that tend to have higher interest rates and collateral requirements. Another study examined the probability that small business loan applications will be denied by consolidating banks and other banks in their local markets, and found no clear positive or negative effects (Cole and Walraven, 1998). A third study found that the probability that a small firm obtains a line of credit or pays late on its trade credit does not depend in an important way on the presence of small banks in the market (Jayaratne and Wolken, 1999). The latter two studies are consistent with a strong external effect of consolidation—that other banks in the market respond when needed.

Current Research Papers

All three of the studies in this session take off on this literature, matching bank data and small business data to disentangle demand and supply effects. Each does it in a different way, each uses the data in a creative way, and each makes a contribution to the literature.

Haynes, Ou, and Berney (1999) have a creative approach to get at the central issue in this literature of whether large and small banks serve relationship-type borrowers equally. They use information from the 1993 National Survey of Small Business Finances (NSSBF) for the small businesses and matching information for the banks that lend to them from the Call Report. The authors do a very good job of controlling for borrower characteristics, and a pretty good job differentiating between types of banks to distinguish demand versus supply factors. This paper may be improved by use of more bank size classes, and perhaps some organizational complexity variables for the banks.

They assess the probability that particular borrowers (large versus small borrowers, risky versus safe borrowers, etc.) with particular types of credit (lines of credit, mortgages, equipment loans, motor vehicle loans, etc.), get credit from large and small banks. This lines up nicely with the theory and earlier empirical results about which types of credit and which types of borrowers are likely to be relationship-driven versus transactions-driven. The results are intuitive, and consistent with the prior literature. Large banks more often lend to larger, older, more financially secure businesses, consistent with the predicted focus on transactions-driven lending, while the reverse is true for small banks focusing on relationship-driven lending.

Cole, Goldberg, and White (1999) also have a creative approach to looking at whether large and small banks tend to concentrate on relationship-based lending (essentially what they call "character lending") versus transactions-based lending (essentially what they call "cookie-cutter lending"). Like Haynes, Ou, and Berney (1999), they use information from the 1993 NSSBF for the small businesses and matching information for the banks that lend to them from the bank Call Report.

An important difference is that instead of a reduced form for whether loans are obtained from large and small banks, they break the decision up into two structural components—whether borrowers apply for loans from large and small banks, and then whether the banks approve or deny. This addresses the approval/denial process more directly.

The authors use good control variables for small businesses and include good relationship variables. Again, it would be nice to see more different bank size classes, and perhaps some organizational complexity variables for the bank. The results are intuitive, and consistent with the prior literature—large banks more often tend to make transactions-based (cookie-cutter) loans and small banks more often tend to make relationship-based (character) loans.

Like the other authors, Scott and Dunkelberg (1999) have a creative approach to looking at supply factors in the banking industry, while controlling for characteristics of the small business. Unlike the other studies, they use information from the 1995 National Federation of Independent Business (NFIB) data set, which asks about whether the small business' principal financial institution was bought out/absorbed.

Their approach has three advantages. First, they use a different data set, which has the benefit of testing the robustness of the findings in the literature, given that most of the recent research using small business data has culled this information from the NSSBF. Second, they have more information about the firm's search efforts, satisfaction of borrowing needs, etc., to measure outcomes. Third, they directly address the issue of consolidation. As was seen in the prior literature, the dynamic effects of bank M&As are not necessarily the same as the static effects of just increasing bank size/complexity. One disadvantage is that the control variables for the small businesses in the NFIB data set are not quite as detailed as those on the NSSBF.

It is a very comprehensive analysis of many dimensions of how well the borrower is treated. The results are somewhat mixed, with consolidation affecting some, but not all of the variables measuring satisfaction of borrowing needs, loan approval/rejection, shopping for lenders, loan rates, etc. in the predicted directions. The mixed results are perhaps not surprising, given the large number of dependent variables employed.

Conclusions

Relationship-based finance is an important tool used by banks, non-bank intermediaries, and others to finance informationally opaque small businesses who may otherwise have much higher funding costs or be significantly quantity-rationed in capital markets. The issue of relationship lending by commercial banks and the effects of banking industry consolidation on the supply of credit to relationship-dependent, informationally opaque small businesses are also important research and policy topics. All three papers make important contributions to the literature, but more research is needed.

Allen N. Berger is a senior economist at the Board of Governors and a senior fellow at the Wharton Financial Institutions Center. His research covers a variety of topics related to financial institutions such as small business finance, credit rationing and credit crunches, and efficiency and profitability. He is also editor of the Journal of Money, Credit, and Banking and the Journal of Productivity Analysis. Berger has a B.A. from Northwestern University and a Ph.D. from the University of California–Berkeley.

Notes

- ¹ For a more comprehensive review of small business finance, see Berger and Udell, (1998) and other contributions to the August 1998, *Journal of Banking and Finance* special issue on this topic.
- ² See Berger and Udell, (1995) for data on “loyalty ratios” which indicate how often small business borrowers reuse the same bank for the same type of loan.
- ³ These figures are from Berger and Udell, (1998, Tables 1 and 2), compiled from the 1993 National Survey of Small Business Finances.
- ⁴ For a recent review of the research on the consolidation of the financial services industry, see Berger, Demsetz, and Strahan (1999).

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THE SMALL BUSINESS LENDING RELATIONSHIP: SESSION A

Discussion Comments
Mitchell A. Petersen
Northwestern University

Two Trends Transforming the Lending Market

Small firms raise most of their outside capital from banks. This is true even if we include the capital that is raised from family and friends (Petersen and Rajan, 1994). The theoretical literature written by academics has argued that small firms are more difficult for outsiders to evaluate and thus, will be more likely to face credit rationing (Stiglitz and Weiss, 1981). For investors to profitably provide capital to small firms, they must be able to accurately evaluate the abilities of the firms' owners and the investment prospects of the firms. This is why empirically we see banks as a major capital provider to small firms.¹ This means major trends in the banking industry can have a significant impact on the amount of credit available to small firms and therefore their ability to fund their projects. Over at least the last decade, there have been two significant trends that have been transforming the banking industry and potentially the way small firms raise capital (Petersen, 1999). The papers in this session are part of the effort to understand these trends, in particular, and how the financial markets that fund small firms work in general. As a way to tie the papers in this session together, I want to discuss these two trends: consolidation in the banking industry and the growing use of information technology by credit providers. The two trends are not independent. At least part of the motivation for consolidation in the banking industry is the changing cost structure of banks. This finds its roots in the greater importance and lower cost of using information technology to do a bank's business.

Computers are very good at collecting and organizing easily quantifiable data. Financial information lends itself to computerization since it is easily quantifiable. Thus it is no surprise that the growth of computers has been followed by the growth of computerized methods for evaluating the profitability of proposed loans. These techniques have entered the arsenal of banks and now are part of the procedure for deciding which borrowers receive credit and which don't. The use of these models—credit scoring models—is more common among large banks (Whiteman, 1998). The use of credit scoring

models, however, seems antithetical to the way in which the academic literature and practitioners have described the lending process for small firms. Small firm lending is described as fundamentally different than lending to large firms. Lending to small firms is based on relationships and intimate knowledge of the borrowers and their businesses. Empirical evidence has demonstrated that relationship lending is an important source of capital for small firms (Berger and Udell, 1995; and Petersen and Rajan, 1994).

It is important to realize, however, that although the use of relationship lending is correlated with firm size (i.e., relationship lending is empirically more important for small firms than large firms), it is not the only way to lend to all small firms. Over the last decade, the development of the lending market to individuals—who are also small borrowers—is the counter example. The market for both unsecured and secured borrowing by individuals was much more relationship-based in the past than it is today (Nocera, 1994). In previous decades, individuals borrowed from the local bank, if at all, and the loan was based on the banker's personal knowledge of the borrowers. This is the current description of how the market for small firm loans functions. Today, however, the market for unsecured borrowing (e.g. credit cards) and secured borrowing (e.g. mortgages) is no longer a local market. It is arguably a national market. Decisions are not made on personal relationships but on hard information that is easily quantifiable and processed by computers. A big question to be answered is to what extent can this same transformation occur in the market for small firm borrowing.

The second trend altering the way in which small firms borrow is the significant decline in the number of banks in the U.S. over the last decade (Berger, Demsetz, and Strahan, 1999; and Berger, Saunders, Scalise, and Udell, 1997). Since the decline in banks has been concentrated among small banks, this has raised the concern that access of small firms to credit may be restricted. Small firms rely on banks for a large fraction of their external capital (Petersen and Rajan, 1994). In addition, small banks make proportionally more loans to small firms (Peek and Rosengren, 1996 and Strahan and Weston, 1998). Thus the importance of small banks to small firms (Haynes, Ou, and Berney, 1999; and Scott and Dunkelberg, 1999) and how small banks are different from big banks is essential to our understanding of how small firms raise capital.

Supply of Capital to Small Firms

The positive relationship between bank size and firm size should not be surprising. There is a mechanical reason why we should expect it. Firm size is correlated, although imperfectly, with the size of a firm's desired loan. Due to regulatory constraints or risk aversion of the loan officers and the fact that banks have limited capital, they will limit their

exposure to a single borrower. As the firm—or, more accurately, its loan demand—grows, the size of the bank that provides the firm's loan will grow also. This will induce a correlation between firm size and bank size—even if large banks are identical to small firms—except for size.

Haynes, Ou, and Berney (1999) document this correlation in their paper. The authors examine the correlation between the size of the bank from which the firm borrows and characteristics of the firm. They find that larger firms—as measured by number of employees—are more likely to borrow from larger banks. Since the number of employees is an imperfect measure of the size of the firm's loan demand, other variables that proxy for this measurement error—i.e., variables that are correlated with the firm's loan demand—should also enter the regression. This is what the authors find. Older firms are more likely to borrow from larger banks. In our work with small firms, we found that it was unusual for a small firm to go to a second bank to borrow. When they did approach a second bank, it was often because they had outgrown their initial (small) bank. The authors also find that urban firms and mining firms are more likely than rural firms and service firms, respectively, to borrow from a large bank. In both cases, this is likely a proxy for larger loan demand.

As larger banks take over small banks, the fraction of their loan portfolio made up by small business loans declines. Which loans are being eliminated by the large banks? In industries with over capacity, mergers have often been the tool by which capacity has shrunk (Jensen, 1986). The same may be true in the banking market. If some banks are making negative net present value (NPV) loans, this will make them a desirable acquisition target. An acquirer can profitably purchase the bank, quit making such unprofitable loans, and create value. In such a case, we should see a drop in lending associated with mergers. This is unfortunate for the individual small firms, but is an improvement in the allocation of capital. Alternatively, the small business loans may be profitable loans. In this case, we should expect that the loans would be continued—unless the acquiring firm is fundamentally different than the firm that ceases to exist and cannot profitably make these loans. Before turning to the next paper, I want to make one more observation on the question of whether these small business loans are profitable.

The definition of a profitable loan is straightforward in a single period setting. The bank makes a loan and it is profitable if the risk-adjusted expected repayments exceed the amount lent. This calculation is more complicated in a multi-period setting. In this setting, lenders should consider both the current loan plus the stream of future profits that may be generated by financing the small firm today. These future profits, however, are only relevant when the capital markets are not perfectly competitive. When the credit market is

competitive, if the lender charged a rate above the competitive one, they would have no business. A monopolistic creditor who shares in the future profits generated by the firm through the future rents the lender is able to extract may be more able to finance small (high risk) firms. A monopolistic lender can charge below market rates in early years of the business and limit the distortion in the firm's investment decision and thus can make lending possible.² To make up for initial losses, given the lender has market power, they can charge high rates when the firm is older, larger, and more profitable. We find empirical support for this story in our work examining the borrowing by small firms. The youngest firms in concentrated credit markets have greater access to capital than similar firms in more competitive capital markets (Petersen and Rajan, 1995; and Scott and Dunkelberg, 1999, Table 7).

This story is relevant for our discussion since the profitability of a loan depends upon how competitive the capital markets are. If the bank includes the future profits it will earn from a business, because they expect the capital market to remain uncompetitive, the loan is profitable. However, the consolidation in the banking industry, to the extent that it is correlated with greater competition, may make such loans look unprofitable. Thus, the acquirer may not renew such loans, labeling them as unprofitable. It isn't the acquisition that made the loan unprofitable; it is the greater competition for the small firm's future business. Since the two effects occur simultaneously, it is difficult to empirically distinguish the cause of reduced lending to some small firms.

The Market Response

Previous research suggests that banks involved in mergers lend less to small firms. This can disrupt lending relations and, as these relationships are valuable, can generate a loss in value for the firm (Slovkin, Sushka, and Polocheck, 1993). The second paper in this session by Scott and Dunkelberg (1999) starts from this point and asks how small firms respond to the shock of their bank being acquired or merged. They are able to answer the question directly by surveying firms whose bank has undergone a merger. This is a nice innovation in the empirical literature. They find that mergers are correlated with increased search for a new bank by small firms, consistent with the story that we have been telling. The univariate increase in the probability that a small firm must search for a new bank is 15% (relative to a sample average of 30%, Scott and Dunkelberg, 1999, Table 3). Once the authors control for differences across firms and the markets in which the firms borrow, the difference drops to 9% but is still statistically significant. The average number of searches rises by only 0.1 (Scott and Dunkelberg, 1999, Table 7, column 3), suggesting that the 9% of firms that must search, contact barely more than one additional bank on average.

How costly this search is, in terms of reduced credit access, depends upon how available alternative sources of credit are. Small firms can borrow from other banks, new banks that arise in response to the demand for capital, or from their suppliers (Petersen and Rajan, 1996). The results in Scott and Dunkelberg (1999) are consistent with those of Berger, Saunders, Scalise, and Udell (1997) and Cole and Walraven (1998). The authors find that a decline in the supply of credit from a firm's bank (when it undergoes a merger) does not necessarily imply a decline in credit availability to small firms. Other providers of capital make up the difference. Mergers are actually correlated with a slightly higher probability of getting a loan (4%) and a slightly lower probability that a firm will report that their borrowing needs have been met (see Scott and Dunkelberg, 1999, Table 7, Columns 4 and 1). As these differences are small, they suggest that small firms are disrupted by having to switch capital sources, but the magnitude of these disruptions appears to be small.

Reduction in credit provided to small firms can be traced to two sources. Firms can apply for a loan and be turned down. We don't find big effects due to mergers in this paper's results. Firms are slightly more likely to get a loan if their bank has been acquired or merged. The decision to apply for a loan, however, is endogenous (Lummer and McConnell, 1989). Thus, changes in the market structure—whether a firm's bank is acquired—may also change the probability of small firms applying for loans. If the firm does not even apply for the loan, as their expectation of approval is too low, their access to capital will be restricted but we will not pick it up in some of our empirical tests. Evidence from Scott and Dunkelberg (1999) may shed light on this question. In Table 1, they present the univariate evidence on the effect of merger activity on the borrower's stated belief that his/her borrowing needs have been satisfied. This should include both being denied a loan as well as being discouraged from even applying. Firms that have been affected by mergers (25% of the sample) are less likely to say their borrowing needs were satisfied (51% versus 57%). They are more likely to say that their borrowing needs have not been satisfied (34% versus 13%). Thus, it appears that mergers reduce credit. However, once the authors control for firm and market conditions, these differences disappear. This suggests that firms of a given quality (based on variables that the authors can observe) do not have their credit restricted.

The results also suggest, however, that the markets where mergers take place are fundamentally different than the markets where there are none. This is the only way to explain why the univariate results give different answers than the multivariate results. In Table 1 of Scott and Dunkelberg (1999), the decline in the 'yes' category (6 percentage points) does not match the increase in the 'no' category (21 percentage

points). The difference consists of the change in borrowers that did not want to borrow. The probability that a firm says that it did not want to borrow is twice as high if its bank was not taken over (28%) than if its bank was taken over (14%). This suggests that the merger is correlated with the market conditions. The mergers are more likely to occur in areas or at banks where there is less loan demand. This is consistent with the story discussed above where industries with over capacity consolidate.

Are Big Banks Different than Small Banks?

In the previous two papers, we have discussed the importance of small banks in providing capital to small firms. An implicit assumption of the literature is that large banks are fundamentally different from small banks. If this were not true, then large banks would continue to lend to small firms if the loans were profitable. In the third paper of this session, Cole, Goldberg, and White (1999) tackle this issue. Small banks may be better than large banks at closely monitoring small firms. If small-firm lending is based on soft information that is not easily quantified, then the lending process to small firms may depend more upon the autonomy and judgement of the loan officer. The fact that the length and strength of a bank/borrower lending relationship, which may serve as a proxy for this soft information, affects the quantity of credit offered, but not the price of credit, is consistent with this intuition (Petersen and Rajan, 1994). An obvious difference between large and small banks is the distance between the loan officer and the manager of the bank. In a small bank, there is little distance and few people between the two. Thus, effective monitoring of loan officers is easier and the constraints under which the loan officers must operate can be looser. This makes it more likely that the loan officers can rely on difficult-to-quantify, or fuzzy information (i.e., the borrower is a good person) in making the loan approval decision. As the banking enterprise becomes larger, it becomes more difficult to monitor the loan officers (Cole, Goldberg, and White, 1999).

Whether or not the loan approval process is different across banks of different sizes is an excellent empirical question and exactly the one which the literature needs to answer. The problem is setting up an empirical test that is informative. The authors provide a clever suggestion. They estimate the loan approval equation (whether a firm's loan is approved or denied) separately for firms who applied to small banks and those who applied to big banks. The big banks, by hypothesis, use quantifiable data. This is the data that is available in the author's data set and includes such variables as firm size, firm age, and the default history of the business and borrower. The small bank may use this information, but it uses additional information. The relative weight that small banks place on this hard information, therefore, must be

lower. They are including variables that the authors cannot see in their model. Thus, in the probit equations estimated by the authors, I would expect the coefficients on the independent variables to be smaller in magnitude for small banks than for large banks.

This isn't exactly what the authors find. First, look at the coefficients on age and size. These are the coefficients that we found provided most of the explanatory power when it came to estimating the interest rate a small firm pays on its loan. The coefficients on firm age and size are (almost) identical economically and are identical statistically (Cole, Goldberg, and White, 1999, Table III). The results for the borrower and the firm's default histories are equally puzzling. The coefficient on the firm's past delinquencies is economically and statistically larger in the small bank model (-0.29) than the large bank model (-0.02). The theory suggests that small banks know the true quality of the borrower and, thus, can look past previous delinquencies for truly good borrowers, even though they look bad on paper. This is not what the empirical results reveal.

Lessons: How are Small Firms Different than Large Firms?

The papers in this session, and a broad literature beyond them, discuss the access to capital of small firms. Many of us have argued that relationship lending is more important to small firms than to large firms. This implies that small firms are different from larger firms. They are not just shrunk-down large firms. As the trends which I began with—the growing use of information technology and the consolidation in the banking industry—transform the way that small firms access capital, researchers, and practitioners will be forced to focus on what it is about small firms that make them unique. Let me suggest three possibilities.

The first way suggests that size matters when there are economies of scale. The cost of originating loans has a potentially big fixed component. This suggests that the cost of originating loans to small firms—since they are likely to be small loans—will be higher. The growing use of information technology to process information and assist in the loan approval process can lower these costs and in the process help small firms. As we have seen in the mortgage and credit card markets, the growing use of information technology and strictly hard/quantifiable information in making credit decisions has coincided with a falling cost of capital for individuals and greater availability of capital.

The second way in which small firms may differ fundamentally from larger firms is in the importance of social or personal ties between the owner/manager and the lenders. This is not an issue that economists have focused on. When economists use the word “relationship,”

they think of it as a tool for transmitting information or controlling the borrower's behavior. The purpose and role of the lending relationship may be broader. Since a small business is probably much more integrated into the personal life of its owner, the importance of social attachments and obligations between borrower and lender may thus be stronger when the firm (and bank) is small (Uzzi and Gillespie, 1999).

A third way in which small firms may differ is their informational transparency. Traditionally, we think of small firms as informationally opaque. By this, I mean it is difficult to capture in numeric measures the true credit risk of the firm. It is difficult to transmit such information without context. This is a statement, however, about small firms in general when compared to large firms in general. This doesn't mean that all small firms are informationally opaque. Some are no doubt informationally transparent. Thus, if the markets continue to shift to using hard information processed by computers to make credit decisions, this can have a dramatically different impact across small firms. Information technology lowers the cost of processing hard information. Information technology does not lower the cost – and may raise the relative cost—of processing soft information. Some small firms will profit from this trend as their cost of capital drops and credit available to them expands. For them, the dominant effect will be lower transactions costs. For other firms, the stereotypical small firms who rely on a relationship with a bank, the expected effects are more ambiguous.

Mitchell A. Petersen is an associate professor of the Kellogg Graduate School of Management at Northwestern University. His articles have appeared in the Quarterly Journal of Economics, Journal of Finance and Journal of Financial Economics. He is an associate editor of the Review of Financial Studies. Petersen has a bachelor's degree from Princeton University and a Ph.D. from Massachusetts Institute of Technology.

Notes

- ¹ Depending upon the nature of the business, institutions from venture capitalists to Community Development Finance Institutions (CDFIs) are also a source of capital.
- ² High promised payments will create an incentive for equity owners to choose different projects. The high, promised payment can make a high risk negative net present value (NPV) project look preferable to a low risk positive NPV project. An all equity firm would always choose the positive NPV project, the levered firm may not. Lenders realizing the distortion in the investment decision created by leverage may choose not to lend at any interest rate (Stiglitz and Weiss, 1981). Relationships, by giving lenders a stake in the future of the firm, can resolve this problem. The relationship is economically equivalent to an implicit equity stake in the firm and thus helps resolve the investment distortion created by debt.

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