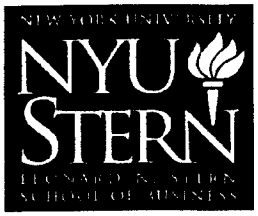

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Youth, Adolescence, and Maturity of Banks: Credit Availability to Small Business in an Era of Banking Consolidation

Robert DeYoung, Lawrence G. Goldberg, Lawrence J. White

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YOUTH, ADOLESCENCE, AND MATURITY OF BANKS: CREDIT AVAILABILITY TO SMALL BUSINESS IN AN ERA OF BANKING CONSOLIDATION

Robert DeYoung*
Lawrence G. Goldberg**
Lawrence J. White***

Abstract

(Draft, 3/16/98)

This paper addresses the relationship between the aging process at new and relatively young banks and the tendency of banks to make loans to small businesses. Defining small business loans as C&I loans that are under $1 million in size, we analyze a sample of banks that had assets of less than $500 million in assets for the years 1993-1996 and that were 25 years of age or younger.

We find, as have earlier studies, that banks' proclivities for small business lending are negatively related to their age and to their size. We proceed much farther, however, by introducing a number of additional explanatory variables. We find that small business lending is negatively related to its recent growth rate and to a bank's being part of a MBHC. Also, small business lending is positively related to higher concentration rates in urban areas but is negatively related to higher concentration in rural areas. Despite the inclusion of these additional variables, the negative effects of a bank's age on its small business lending persist, albeit with reduced magnitudes.

We also divide our sample into dichotomous groups and examine the differences between the groups. The divisions encompass "very young" versus "somewhat older" banks, freestanding versus MBHC banks, and urban versus rural banks. The results for these sub-samples generally support our overall findings.

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* Office of the Comptroller of the Currency, Washington, DC 20219; 202-874-5427; robert.deyoung@occ.treas.gov

** University of Miami and Stern School of Business, NYU, 44 West 4th St., New York, NY 10012-1126; 212-998-0358; lgoldber@stern.nyu.edu

*** Stern School of Business, NYU, 44 West 4th St., New York, NY 10012-1126; 212-998-0880; lwhite@stern.nyu.edu

YOUTH, ADOLESCENCE, AND MATURITY OF BANKS: CREDIT AVAILABILITY TO SMALL BUSINESS IN AN ERA OF BANKING CONSOLIDATION

Robert DeYoung*
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(Draft, 3/16/98)

I. Introduction

The banking industry is currently in the midst of a well-documented period of consolidation. Major bank mergers are announced on a near weekly basis. Simultaneously, banking has been losing market share to other financial services providers (Edwards, 1996).[1] These two trends are characteristics of a mature or even declining industry. Yet, this consolidation and relative decline has been accompanied by a substantial amount of entry by de novo banks (see Figure 1), which is not typical for a declining industry.

Simultaneously, the provision of credit to small businesses continues to be a subject of considerable public policy concern. Banks are seen as crucial sources of this flow of credit; but their ongoing consolidation has generated political concerns that the larger banks that emerge

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* Office of the Comptroller of the Currency
** University of Miami and Stern School of Business, NYU
*** Stern School of Business, NYU

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[1] But for a contrary view, see Boyd and Gertler (1994).

will be less likely to lend to small businesses than were their smaller predecessors. Recent research has revealed that there is a solid empirical basis for such concerns (Berger et al., 1998; Peek and Rosengren, 1998; Strahan and Weston, 1998).

De novo banks appear to be an antidote to this tendency, since they make loans to small businesses in significantly greater volumes (as a percentage of their assets) than do otherwise similar incumbent banks (Goldberg and White, 1998). However, the reasons why de novos make relatively more loans to small businesses remain largely unexplained. DeYoung (1998) provides evidence that points to one possibility: The de novos' lending proclivities are due, at least in part, to their youth itself. He finds that, as de novo banks grow older, their small business lending declines and eventually (at about year 20) flattens and reverts to the lower levels of incumbents.

This finding, however, raises important questions: Why does the age of the bank matter with respect to its lending decisions? Is age simply standing in as a proxy for other influences that change as a bank matures? Or is the process of aging itself somehow a separate influence on the evolution of a bank's lending behavior? Equivalently, what are the influences on and consequences of a bank's evolution and life cycle? Furthermore, what are the other influences on banks' small business lending that may not be related to age but that may nevertheless be important?

It is this group of questions on which this paper will focus. Addressing these questions is important for understanding small business finance, for dealing with the policy concerns surrounding small business finance, and for understanding the evolution of the bank as a business enterprise.

This paper will proceed as follows: Section II briefly reviews the relevant literature on this topic. Section III discusses some specific hypotheses with respect to banks' lending behavior vis-a-vis small businesses and especially with respect to the question of aging. Section IV describes the data that we use to test these hypotheses and the specific variables that are used. Section V presents the results of our empirical tests and commentary on those results. Section VI offers a brief conclusion, including policy implications and suggestions for future research.

II. Literature Review

This paper addresses the relationship between the aging process at new and relatively young banks and the tendency of banks to make loans to small businesses. The relevant literature can be divided into two main bodies: The first deals with small business lending by banks and, in particular, by de novo banks; the second examines the behavior of the bank as it ages and reviews studies of de novo banks and studies of the post-entry performance of de novo banks.

A. Banks and Small Business Lending.

Commercial banks have a special expertise in evaluating loan applications and in monitoring loans that have been granted. Because of informational problems, loans to small businesses are especially difficult to evaluate. There is a distinct advantage for the lender to a small business to be located geographically close to the borrower. Smaller banks may be

organized in a manner that makes it easier to deal with small business borrowers (Berger and Udell, 1996). Larger banks with extensive local branching networks may not be able to replicate the advantages of the small local bank because branch managers may be frequently rotated and decision making may be centralized (Berger et al., 1998). Furthermore, larger banks have more extensive lending opportunities and may decide to ignore small business borrowers.[2] Similarly, large borrowers have greater access to other markets and lenders. Consequently, we would expect smaller banks, many of which have been recently formed, to focus more on small business loans.

A group of recent empirical studies have studied small business lending; many of them employ the recently available data from the FDIC Reports of Condition and Income (Call Reports) on small business loans. Measuring small business lending as a percentage of a bank's assets, a number of these studies find a strong inverse relationship between lending to small enterprises and the size of bank (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). A similar relationship is found for agricultural loans by rural banks (Levonian, 1996).

A related issue is the effect of the recent merger wave in banking on credit availability to small business. Some studies find that mergers reduce lending to small business (Peek and Rosengren, 1996; Berger et al., 1998), while others reach the opposite conclusion (Whalen 1995; Strahan and Weston, 1996, 1998). Mergers between smaller banks do not appear to

[2] This may change as large banks begin to use credit scoring models to make and securitize loans to small businesses. See Mester (1997).

reduce small business lending (Peek and Rosengren 1996,1998; Strahan and Weston, 1996,1998; Berger et al., 1998). In addition, the characteristics of the acquiring bank (e.g., its proclivities toward making small business loans) can influence the lending of the combined entity (Peek and Rosengren, 1998).

Goldberg and White (1998) analyze directly the small business lending of de novo banks between 1987 and 1994. The authors define a de novo bank as a bank with assets between $5 and $100 million that had been operating for no more than three full calendar years.[3] Employing both simple t tests and regressions holding other factors constant, the study finds that de novo banks, and particularly three-year-old banks, devote a significantly higher proportion of their portfolios to small business lending than do incumbent banks. However, the Goldberg and White study does not say anything about what banks do with respect to small business lending after reaching the age of three.

B. Aging and Bank Performance.

In this paper, our primary focus is how a newly chartered bank's tendency to make small business loans changes as it ages. Although a number of studies examine the growth and performance of de novo banks as they grow older, only one study (DeYoung 1998) looks at the question of bank age with respect to small business finance. Nevertheless, these studies explore issues that are relevant to our study.

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[3] In order to study a longer time series of data, Goldberg and White use the commercial and industrial (C&I) loans of these banks as a proxy for small business loans, because data on small business loans were not available until 1993. Because of regulatory constraints on loan size and the nature of activities at small banks, the C&I loans of small banks should be largely directed to small businesses.

The first step in a bank's life cycle is market entry. DeYoung and Hasan (1998) review the literature on determinants of de novo market entry. On balance, past studies tended to find that de novo entry is more likely to occur in local markets that are large, growing, less concentrated, newly deregulated, and highly profitable. More recently, Amel and Liang (1997) estimate a dynamic model of market entry and potential profits from 1977 to 1988 and find results consistent with these earlier studies.

Once a bank has acquired a charter and has begun operations, a diverse set of conditions can influence its performance. Studies by Arshadi and Lawrence (1987) and Hunter and Srinivasan (1990) suggest that internal factors under the control of bank managers (e.g., expense controls, asset growth rates, credit policies, and initial capitalization) have at least as large an influence on the performance of de novo banks as do exogenous market conditions. Rose and Savage (1984, 1986) find that independent de novo banks tend to gain market share faster, have lower expense ratios, and hold less risky assets, than do de novo affiliates of multibank holding companies. Other studies have found that de novo banks are no more likely to fail than other similar banks (Gunther, 1990; Huyser, 1986) after controlling for market conditions and business strategies. Similar results are found for thrift institutions by Hunter, Verbrugge, and Whidbee (1996). This evidence is the opposite of that generally found for new enterprises and may be due to the effect of regulatory oversight.

Finally, a small set of papers examines the performance of newly chartered banks as they age. Brislin and Santomero (1991) show that a de novo bank's profits tend to increase dramatically during the first four quarters that it operates. Hunter and Srinivasan (1990) find that de novo bank profits tend to improve between three and seven years of age, but that seven

year old banks remain significantly less profitable than otherwise similar established banks. Huyser (1986) studied de novo banks prior to industry deregulation and found that, for many of these banks, return on assets followed an increasing trend that lasted for 13 years. DeYoung and Hasan (1997) track the post-deregulation profit efficiency of de novo banks and find that profitability improves dramatically for the first three years of bank's life, slows down after that, and finally attains established bank levels after about nine years.

DeYoung (1998) extends the results found by Goldberg and White (1998) that 1-year old, 2-year old, and 3-year old de novo banks lend more to small businesses than do comparable other banks. He asks the question (which is not addressed by Goldberg and White), "What happens after year three?" Defining small business loans as commercial and industrial (C&I) loans less than $1 million, he finds that small business loans as a percentage of total loans declines as banks age. He then tries to disentangle the effects of age from the effects of bank size by regressing the proportion of small business loans on a quadratic specification of age and bank size. His results confirm that age still has an effect on small business lending that is independent of the size of the bank.

The current study expands the analysis performed by DeYoung. We examine the age profile of small business lending in more detail and also utilize a more extensive model incorporating other independent variables to explain the pattern of small business lending by banks. These results provide information about an important aspect of bank activity -- small business lending -- as banks progress from youth through adolescence to maturity.

III. Hypotheses

As a bank ages its focus may well change, including its proclivity to lend money to small businesses. As discussed above, previous studies have shown that de novo banks emphasize lending to small businesses more than do established banks. In this section, we suggest a variety of reasons for expecting that this emphasis would diminish as de novo banks age. We also extend a number of testable hypotheses concerning non-age factors that could influence small business lending, either apart from or in conjunction with bank age.

New banks need new customers. In order to attract new business, managers of de novo banks will aggressively pursue the customers for which their bank has a particular competitive advantage in serving. Since de novo banks will typically be small and will concentrate on a local geographic region, the small business customer is a logical candidate to pursue in order to develop the business of the bank. This is especially true in the current merger environment where small businesses often feel that they are being neglected by the large banks that emphasize large customers and new product choices. Managers and loan officers that are displaced by mergers often find work with a local de novo bank, and these managers may be influential in attracting their former small business customers to the new bank.

As the bank gets older, certain conditions change, and the bank may no longer act like a de novo bank. Some of the initial borrowers may have flourished financially and grown too large for the de novo bank to service. These customers may turn to a larger bank or may even go directly to the credit markets for financing. The atmosphere and culture of the de novo bank will also change with age. Initial managers and officers will retire or move on to other

organizations. The aggressive and hungry atmosphere of the de novo bank frequently will give way to the more complacent and relaxed atmosphere of an established organization that is less focussed on recruiting new customers from the small business sector. With age and growth, the bank will feel capable of providing a broader range of banking services, and this may also reduce the emphasis on small business lending. We do not have any prior expectations as to the age when the new bank starts to change in character. It surely will vary greatly by bank. However, we do expect that there will be a negative relationship between the proportion of small business lending and the age of the bank.

There are a number of age-related factors that may have an effect on the amount of small business lending, independent from the effects of bank age. Bank size is the most obvious of these factors. As banks age they tend to get larger, and increased size allows banks to make larger loans and to engage in other types of business. As has been found in the literature, as bank size grows beyond the $100 to $300 million in assets range, it invests a smaller percentage of its assets in small business loans (Peek and Rosengren, 1998; Strahan and Weston, 1998). DeYoung (1998) finds that this size effect exists even when age is taken into account. We will test whether asset size continues to have an effect on small business lending after accounting for other factors in addition to bank age.

The branching strategy of a bank may influence its small business lending proclivities in ways that are difficult to predict a priori. On the one hand, multiple branches may put a bank in closer touch with its small business customers and allow the closer monitoring that is vital for small business lending (if the monitoring is done at the branch). On the other hand, if loans must be approved at a central headquarters, with more bureaucracy and formality and less

flexibility,[4] then multiple branches may impede small business lending and may instead be used primarily for deposit-gathering purposes.

Rapid growth may be a signal that large size, and the expanded opportunities that accompany large size, are primary goals for the bank. Hence, small business lending may simply be a short-run strategy for rapidly growing banks, abandoned once the bank attains critical size. The distractions of rapid growth also may cause banks to lose the sharp focus and attention necessary to serve the smaller entities in their local communities. In either case, the recent growth rate of the bank should be negatively correlated with small business loans.

The average size of a bank's small business customers may be an important determinant of the percentage of its assets devoted to small business loans. Everything else equal, a bank with relatively large small business accounts will be devoting a greater percentage of its assets to this line of business than will a bank with an equal number of relatively small small (sic) business accounts. However, as the very largest of these accounts grow, the bank's portfolio of small business loans may actually shrink as these loans pass beyond the $1 million threshold used by the Call Report to define small business loans. Accordingly, we would expect a bank's asset share of small business loans to increase at a decreasing rate with average loan size.

A bank's organizational form can be very important with respect to its proclivity to make small business loans. Our sample contains banks that were chartered as "freestanding" entities (independent banks or sole affiliates of one-bank holding companies) and remained so throughout their lives; banks that were chartered as affiliates of existing MBHC organizations and remained so throughout their lives; and banks that were chartered as freestanding entities but became

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[4] See Cole, Goldberg, and White (1997).

affiliates in multibank holding companies through acquisition or some other structural change. For some of the reasons discussed above, we would expect that the freestanding, locally oriented banks would be more inclined to pursue small business loans. We will test this by examining both the organizational status of the bank in its initial year and in the year during which we observe the bank.

The market setting can also play an important role in the tendency of the bank to pursue small business loans. We consider two indicators of market conditions: urban versus rural markets and market concentration. Since concentration is generally higher in rural markets, we also examine the interaction between the two variables.

The effect of market concentration on small business lending can be analyzed in several ways. Though a more concentrated market usually means more limited choices of lenders for a borrower, this limited availability may also encourage a lender to make the initial investments in data-gathering and monitoring of a borrower, since the lender is more assured that an on-going relationship with a successful borrower will be maintained (Lang and Nakamura 1989, Petersen and Rajan, 1994, 1995). However, the structure-behavior-performance paradigm predicts that higher concentration will lead to higher loan prices and smaller quantities of loans (Hannan, 1991). In this context, the effect of higher concentration on small business lending should be negative for a bank with large market share, while a smaller bank in a concentrated market might find the higher interest rates to be a positive inducement to make more small business loans.[5] Overall, the effect of concentration on the quantity of loans is complex and

[5] Differences in market concentration are more likely to affect the price and quantity of small business loans than the prices and quantities of other bank products, because the determinants of small business loan supply and demand are almost exclusively local.

thus indeterminate.

Due to their location, banks in rural markets tend to make relatively fewer small C&I loans and instead concentrate their small business lending efforts in agriculture. (The Call Reports classify small farm loans separately from small business loans, and we focus exclusively on the latter in this study.)

IV. The Data, and the Specific Variables

Beginning in 1993, U.S. commercial banks have been required to report to the FDIC the number and volume of small (under $1 million in size) C&I loans that they held at the end of the second quarter (June 30). The number and volume of these loans are likely to be representative of banks' lending relationships with small businesses. Thus, the primary source of data for our empirical tests are the second quarter Call Reports from 1993, 1994, 1995, and 1996. Table 1 displays summary statistics and brief definitions for each of the variables used in our analysis.

We limited our analysis to commercial banks that had been in business (i.e., received a new bank charter and had opened its ledger) for at least 6 months but no more than 25-1/2 years. We included only those commercial banks that accepted insured deposits, provided transactions (checking accounts) services, made loans, were located in one of the 50 states or in the District of Columbia, had no foreign ownership, and operated no foreign offices. We excluded from this sample any bank that (a) was a pre-existing depository institution that

received a new charter as part of a reorganization, (b) had an unusually low ratio of equity capital to assets at the end of its first calendar year of operation, (c) acquired another bank within a year of receiving its charter, (d) held more than $100 million in assets at the end of its first calendar year of operation, or (e) had assets in excess of $500 million at the time of observation.[6] This process produced a time-series, cross-section data panel containing 7,954 observations of 2,374 different banks across four years (1993 through 1996). The panel is unbalanced because some banks were acquired or failed during the four-year observation period, while other banks were chartered during the observation period.

The dependent variable that is used in most of our tests is SBLASS: the ratio of a bank's small business lending to its total assets. We multiply this ratio by 100, so that the figures are expressed in percentage terms. Small business lending is defined as C&I lending of under $1 million.

A crucial variable for our empirical tests is AGE: the number of years since the bank's general ledger was opened for the first time. Since we know the month of the bank's start-up[7] and we observe banks' small business lending as of June 30, then AGE=0.5 for a bank that

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[6] All dollar figures are in terms of constant 1996 dollars. Filters (a) and (b) are designed to identify new charters that were not associated with new bank start-ups. Filter (b) excluded any bank whose initial year-end equity-to-assets ratio fell below the 5th percentile of the distribution of initial year-end equity-to-assets ratios for all banks chartered in the same calendar month as the bank in question. This threshold ranged from about 6 percent for banks chartered in January to about 16 percent for banks chartered in December, and averaged about 11 percent across the sample. Filters (c) and (d) are designed to identify initial behaviors that are atypical of new bank start-ups. The vast majority of banks eliminated by filter (c) made acquisitions within a few days of start-up. Filter (e) limits our sample to bank sizes typically associated with new bank start-ups and start-up behaviors. Together, these five filters eliminated 1,099 observations over the four years.

[7] Thus, we actually measure the age of the bank in months, though we report all age data in terms of years. We thank Larry Mote for the suggestion to measure age in months.

opened 6 months earlier (in December of the previous year), AGE=1.0 for a bank that opened in June of the previous year, and so on.[8] This variable allows us to test the extent to which bank age has a negative effect on small business lending (as found by DeYoung 1998), or whether age is simply a proxy for other influences on the bank.

Because we have only four years of data in our panel, we cannot track the effects of aging for any given bank for more than four years. However, we observe 25 separate age cohorts of banks in each of these four years. This allows us (a) to observe *directly* the aging process for 22 different segments of the bank life cycle (i.e., 1-year to 4-years old; 2-years to 5-years old; ...; 22-years to 25-years old), and (b) to *infer* the effects of aging by aligning all observations by bank age (regardless of year observed) and comparing bank behavior across different age cohorts. Hence, our conclusions about the effects of bank age on small business lending are drawn from the combined influences of the four years of aging of the individual banks that we observe directly and the cross-sectional differences among the age cohorts that we also observe.

ASSETS is the total assets of the bank as of the year of observation, and SQASS is the square of ASSETS. These two variables allow us to test for the parabolic relationship between SBLASS and ASSETS found by Peek and Rosengren (1998), Strahan and Weston (1998), and DeYoung (1998). The literature suggests that increased bank size will begin to have a negative effect on small business lending somewhere on the $100 to $300 million in assets range.

YR94, YR95, and YR96 are 1,0 dummy variables that indicate the year of observation.

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[8] We exclude banks with $0 \leq AGE < 0.5$ because the assets and liabilities of very young banks change rapidly from month to month and might not accurately portray the business strategies of these banks.

(We use 1993 as the base year in our tests.) These variables allow us to capture any secular trends in lending and provide a crude control for changes in economic and regulatory conditions across the four years of our data.

OFFICES is the number of branch locations of the bank, including its home office.[9] The number of branches may be indicative of certain kinds of lending strategies. In principle, this variable's sign could be positive or negative.

URBAN is a 1,0 dummy variable indicating whether the bank is headquartered in an MSA. We expect this variable to have a positive coefficient, since rural banks have different lending opportunities (they can make agricultural loans more easily) and may have fewer proximate small businesses to which they might lend.

HHI is the Herfindahl-Hirschman Index[10] of concentration (measured by the deposits of commercial banks and savings institutions) in either the MSA where the bank is headquartered (if URBAN=1) or the county where the bank is headquartered (if URBAN=0). As discussed above, the sign on the concentration variable is indeterminate. Higher concentration is likely to mean higher interest rates on loans (Hannan, 1991) and thus fewer small business loans; but a smaller bank in a high concentration area may see the high-interest-rate environment as an opportunity for making more loans. Also, high concentration implies high switching costs for successful borrowers, reassuring a lender that a lending relationship with a borrower will continue and thereby increasing the likelihood that the bank will make such loans (Lang and Nakamura 1989, Petersen and Rajan, 1994, 1995).

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[9] We excluded five banks with unrealistic year-to-year fluctuations in the number of branches.

[10] This is the sum of the squared market shares of sellers in a market.

URBANHHI equals URBAN*HHI. Because bank concentration is substantially higher in rural markets (mean HHI is 0.2809 for the rural banks in our sample) than in urban markets (mean HHI is 0.1085), the marginal effect of an increase in concentration could be different.

GROWTH5 is the average annual real growth rate of assets of the bank in the most recent five year period (or an appropriately shorter period if AGE < 5), expressed in percentage terms. Even though GROWTH5 excludes the rapid growth in the first six months of banks' lives, mean annual real growth was still about 16 percent.[11] The sign on this variable is, in principle, indeterminate, but a rapid growth strategy may well be inconsistent with a major focus on small business lending.

MBHC is a 1,0 dummy variable indicating whether a bank is part of a multi-bank holding company as of the observation date. We expect the sign on this variable to be negative. Holding the size of a bank constant, affiliation with a MBHC suggests that small business lending will be a smaller part of the bank's business strategy (Berger et al., 1998). YR1MBHC is a 1,0 dummy variable indicating whether a bank was part of a MBHC in the year that the bank began operations. We expect this coefficient to be negative.

SIZESBL is the average size of a bank's small business loans, and SQSIZE is the square of loan size. These two variables allow us to test for a non-linear relationship between SBLASS and SIZESBL. As discussed above, SBLASS should increase with loan size, but the truncation of the small business loan data at $1 million will likely influence the shape of this relationship.

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[11] The distribution of GROWTH5 was strongly skewed to the right, likely due to acquisitions made after these banks' first year of existence. Because this resulted in some very large positive growth rates, we truncated GROWTH5 at 1.00 (i.e., a 100% annual real rate of growth) for about 200 observations.

We interact AGE with two variables whose values tend to change with the age of the bank. Growth rates decline severely as de novo banks mature (GROWTH5 was about 51 percent for the 1- to 5-year old banks in our sample, but only about 7 percent for the 21- to 25-year old banks), while affiliation with multi-bank holding companies increases substantially over time (only about 17 percent of the 1- to 5-year old banks were affiliated with MBHCs, compared to about 31 percent of 21- to 25-year old banks). AGEG equals AGE*GROWTH5, and AGEM equals AGE*MBHC. The signs of these two variables are indeterminate -- a priori, it is not clear how growth rates and/or organizational form will influence the relationship between bank age and small business lending.

STATEDUM is a set of 1,0 dummy variables that indicate the state in which the bank is headquartered. These dummy variables may indicate special regulatory conditions in specific states as well as specific economic and business conditions that may be relevant to the banks located in that state.

V. Empirical Results

We employ generalized least squares (GLS) methods to estimate the determinants of SBLASS, the percentage of a bank's assets that is devoted to small business lending, allowing for random group effects and fixed time effects in the estimation.[12] We observe each bank up

[12] See Greene (1997, ch. 14). We have also estimated (but do not report the results) our basic model using ordinary least squares techniques, both with and without fixed group effects. We refer to the results of these alternative tests below in footnotes to the main text.

to four times; allowing for random effects explicitly takes into account the variation in SBLASS that is special to each bank. The basic equation to be estimated is:

$$SBLASS_{i,t} = a + b*\mathbf{X}_{i,t} + c*\mathbf{T}_i + e_{i,t} + u_i$$

where i,t refer to observations on the i^{th} bank in the t^{th} year; $\mathbf{X}_{i,t}$ is the vector of independent variables described previously in Section IV; $\mathbf{T}_i$ is a vector of fixed time dummies (i.e., YR94, YR95, YR96); $e_{i,t}$ is a random disturbance common to all banks i in all periods t; and u_i is a random disturbance unique to each bank i but constant across time.

A. Replicating DeYoung's Results.

We begin with the entire sample of 7,954 observations on banks in 1993, 1994, 1995, and 1996. In Figure 2 we simply plot median levels of SBLASS against AGE, replicating DeYoung's (1998) basic graphical result for our data. The downward trend of small business lending with respect to age is striking. This is clearly not just a short-term "seasoning" effect; it persists until at least year 20.

In column (1) of Table 2 we attempt to replicate DeYoung's (1998) basic regression results: i.e., that the intensity of small business lending is negatively related to bank age, and that the intensity of small business lending at first increases, but then decreases, with bank size. We are able to replicate the first of these results, but not the second. SBLASS is significantly and negatively related to AGE. An extra year of age is associated with a 22/100ths percentage point reduction in the amount of a bank's assets devoted to small business lending, which is

equivalent to a 1.8% decline in SBLASS at the means of the data. We specify SBLASS as a quadratic function of ASSETS, but this relationship is not statistically significant.[13]

The coefficient on YR94 is not significantly different from zero, but the coefficients for YR95 and YR96 are both significant and positive. These estimates suggest that SBLASS was, on average, about 0.2 percentage points higher in 1995 than in 1993, and about 0.7 percentage points higher in 1996 than in 1993. Although these effects are comparatively small, they suggest that (controlling for bank age and size) small business lending comprised a larger percentage of bank assets late in our data sample, possibly because the rapidly expanding economy during those years was a healthy environment for small business activity.[14]

B. Testing the Basic Hypotheses.

In columns (2), (3), and (4) of Table 2 we include the specific variables that allow us to test the hypotheses discussed in Section III. The successive inclusion of the additional variables substantially improves the overall explanatory power of the regression, bringing the adjusted R^2 up from 0.04 (for column (1)) to 0.19 (for column (4)). With only one exception, all of the

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[13] DeYoung (1988) used ordinary least squares (OLS) techniques, while the regression in column (1) allows for random effects. When we re-estimated column (1) using OLS techniques (not shown), the coefficient on ASSETS was positive and significant, the coefficient on SQASS was negative and significant, and the estimated inverted parabola peaked at about $150 million in assets. For the random effects specification of column (1), if SQASS is excluded, the coefficient on ASSETS has the value -0.007 with a t-statistic of 4.24.

[14] Some researchers have feared that the small business loan data for 1993, the first year in which these data were collected, might be unreliable. Thus, another interpretation of our results is that the small business lending data were biased downward in the initial years and that the data collection process improved over time and captured more fully small business lending. The statistically insignificant coefficient on YR94 suggests otherwise (although we have not explored the "noisiness" of the 1993 data as compared with the 1994 data). Including the fixed time dummies should absorb any systematic secular trend in small business lending, whether real or reported.

additional variables are significant at least once at a 5% level in these three regressions. Overall, the estimated coefficients conform reasonably well with the hypotheses presented in Section III.[15]

The following results are worth noting:

AGE. Bank age still has a negative and significant effect in column (2), but the magnitude of the effect is slightly smaller. An extra year of age is associated with about a 0.17 percentage point decline in SBLASS for the average bank.

As de novo banks age, the rapid growth of their early years slackens, and the likelihood that they become part of a MBHC rises.[16] To test whether these events in a de novo bank's life cycle have an effect on small business lending, we added the interaction terms AGEG (=

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[15] All of the results reported in Table 2 were generated using a random effects model with fixed time effects. As a robustness test, we also estimated the specifications from columns (3) and (4) using a number of other techniques. First, we applied OLS techniques with fixed time effects to the full data panel. The OLS coefficients were very similar to those in Table 2 for all but one of the variables of interest (the coefficient on OFFICES became negative and significant). The OLS *t*-statistics tended to be slightly higher than those in Table 2, although some declined, and application of White's heteroscedasticity-corrected standard errors made little difference in the *t*-statistics. The Breusch-Pagan Lagrange multiplier test rejected the null hypothesis of no random effects. Second, we applied OLS techniques to each of the four annual cross sections. These results were also quite similar to those in Table 2, although the coefficients on a number of variables (URBAN, GROWTH5, YR1MBHC) lost statistical significance in some of the cross sections. Third, we applied fixed effects techniques (OLS estimation with bank-specific constant terms) with fixed time effects to the full data panel. (We excluded from the regression YR1MBHC, URBAN, and STATEDUM variables that had no variation across time for individual banks.) R^2 increased dramatically to 0.88, and a number of coefficients changed sign but remained significant. These results suggest (a) that SBLASS has a large amount of variation across banks that is unrelated to the right-hand-side variables, and (b) that the bank-specific constant terms introduced substantial amounts of multicolinearity to the regression. Hence, we could not use the fixed-effects model to test the hypotheses of interest.

[16] The simple correlation between AGE and GROWTH5 equals -0.52 and is statistically significant, and the simple correlation between AGE and MBHC equals +0.13 and is statistically significant.

AGE*GROWTH5) and AGEM (= AGE*MBHC) to our basic regression in columns (3) and (4). The positive coefficient on AGEG indicates that rapid growth tends to dampen the negative effect of aging on small business lending. However, this effect is modest: in column (4), a doubling of the growth rate from 16 to 32 percent reduces the marginal effect of AGE on small business lending by only about a fifth to a quarter (.003*16=0.048). The positive coefficient on AGEM indicates that affiliation with a multibank holding company further slightly dampens the negative aging effect.

Hence, the effect of bank age on the intensity of small business lending found by earlier studies was to some extent a proxy for other influences. But the persistence of AGE's significance and negative sign in these more complete regressions indicates that a bank's age does appear to have a separate negative influence on its small business lending.[17]

ASSETS. The coefficient on ASSETS becomes negative and statistically significant in the full model, although the coefficient on SQASS remains insignificant. Thus, bank size has a simple negative relationship to small business lending. A $1 million increase in bank asset size is associated (in column (3)) with a .02 percentage point (at the means, about a 0.15%) decline in the amount of a bank's assets devoted to small business lending. This result is consistent with findings by Peek and Rosengren (1998) and is somewhat consistent with Strahan and Weston (1998) and DeYoung (1998), who find that the intensity of small business lending eventually decreases with bank size beyond some relatively low asset-size threshold. Our results suggest that larger banks have (and take advantage of) wider opportunities for activities other than small

[17] Unfortunately, data were not available to allow us to introduce other variables into the regression for which AGE might be a proxy -- e.g., the times at which banks experience a change in senior officers and thus (potentially) a change in strategy.

business lending. Increased size may allow greater production possibilities or may simply allow banks to transcend regulations that limit the size of loans to any single borrower.[18]

OFFICES. The coefficient on OFFICES in columns (2), (3), and (4) is never statistically significant. The lack of significance may simply be due to our inability to separate statistically the effects of bank size and number of bank offices. (The simple correlation between OFFICES and ASSETS equals 0.69 and is significant at the 1% level). When ASSETS and SQASS were excluded from column (4) (not shown), the coefficient on OFFICES became negative and statistically significant. Thus, we cannot draw strong conclusions about the relationship between branch network size and small business lending -- although it appears that we can rule out a positive relationship, which would have indicated that larger branch networks help facilitate small business lending. In contrast, the negative coefficient suggests that additional branches are antithetical to small business lending -- e.g., that lending relationships and loan monitoring occur in the main office, or that a branch network is characteristic of a consumer banking strategy (consumer lending and cross-selling of other financial products).

URBAN and *HHI*. As was noted in Section IV, rural banking markets tend to be much more concentrated than urban markets. In our data set, the linear correlation between a bank's headquarters (URBAN) and the concentration of financial institutions at that location (HHI) equals -0.66 and is significant at the 1% level. Hence, the interaction term URBANHHI is

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[18] These limitations are frequently described as the "loans to one borrower" limitations and restrict the amount of lending that a bank can extend to any single borrower to 15% of the bank's capital (net worth). Since a small business loan is defined to be one that is less than $1 million, a small bank's commercial lending is perforce limited to small business loans, whereas a larger bank can make larger loans and thus has a greater choice (in terms of the size of its loan customer).

crucial for understanding the effects of the two variables.

The marginal effects of HHI on SBLASS (= β_{HHI} + $\beta_{URBANHHI}$*URBAN) and the marginal effect of URBAN on SBLASS (= β_{URBAN} + $\beta_{URBANHHI}$*HHI) are both statistically significant and stable in columns (2) and (3). However, these expressions become unstable and statistically insignificant in column (4) (which includes dummy variables for state location). Including the state dummies sharpens the estimates in some cases (e.g., the coefficients on AGEM and YR95 become statistically significant), but it muddies the effects of market concentration.[19] This is likely because Herfindahl indices are related to population densities, branching laws, and other conditions that vary across states and that are captured in the state dummies. Hence, we will use the estimated coefficients from column (3) to analyze the effects of market concentration and bank location on small business lending.

The average HHI facing the urban banks in our sample is 0.1085, compared to 0.2809 for the rural banks in our sample. Holding all other influences constant, the average urban bank lends about 1.3 percentage points (or about 12%) more of its assets to small businesses than does the average rural bank ([-0.67-4.57*0.1085+11.73*0.1085]-[-4.57*0.2835]=1.4). When we examine the marginal effects of HHI in a rural market, a 0.01 increase in the HHI[20] reduces the percentage of the average bank's assets devoted to small business lending by about 5/100ths of a percentage point (-4.57*0.01), or about 0.46 percent. That same 0.01 increase of the HHI in an urban market would cause SBLASS to *increase* by about 7/100ths of a percentage point

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[19] An F-test rejected the null hypothesis that the vector of coefficients on the STATEDUM variables is jointly equal to zero.

[20] This 0.01 increase is the same as the 100 point increase that is a crucial parameter in the DOJ-FTC Horizontal Merger Guidelines of 1992.

([-4.57+11.73]*0.01=0.07), or about 0.56 percent. The results for urban markets are consistent with the findings of Lang and Nakamura (1989) and Petersen and Rajan (1994, 1995) that relationship lending may increase when lenders have market power.[21] The results for the rural markets are evocative of the traditional structure-behavior-performance paradigm, but they could also be driven by the heterogeneity of lending conditions across rural markets. For rural banks, the HHI may simply be a proxy for the "ruralness" of the market rather than a measure of the degree of competition. Sparsely populated, "super-rural" markets are likely to have extremely high HHIs, and the banks located in these markets will naturally make very few small business loans because their lending base is small farmers, not small businesses.

GROWTH5. The rate at which a young bank grows its assets has a significant impact on the percentage of those assets it devotes to small business lending, but the direction of this relationship depends on whether the bank is very young or only relatively young. For the average 1-year old bank, a doubling of its already high annual growth rate (GROWTH5=80%) is associated with a reduction in its small business lending percentage by more than a percentage point ((-.02+.003*1)*80=-1.36), or by about 10 percent. The sign of this derivative reverses for banks that are more than 6 years old. For example, a doubling of annual asset growth for the average bank in our sample (AGE=12.4) is associated with an increase in the small business loan rate of about 3/10ths of percentage point ((-.02+.003*12.4)*16=.275), or about 2 percent. Apparently, a small business lending strategy is incompatible with fast growth at brand new de

[21] It is important to note that the positive effects of higher HHI in urban markets are solely for the relatively young and modest-sized banks in our sample. Since significant positive changes in HHI in urban markets are likely to be caused by mergers among already sizable banks, the effects on their small business lending are likely to be negative, for the reasons discussed in Berger et al. (1998).

novo banks, while fast growth is more conducive to the formation of small business relationships at more established, older de novo banks.

MBHC and *YR1MBHC*. The average affiliate of a multi-bank holding company (MBHC) in our sample makes about 0.5 percentage points (-1.48+.07*14.0), or about 5 percent, fewer small business loans than does the average freestanding bank. Furthermore, if the holding company affiliate began its existence as part of a holding company (YR1MBHC), rather than subsequently merging into it, it does substantially less small business lending -- an additional reduction of 1.9 percentage points, or about 18 percent. Despite being only slightly larger than their freestanding counterparts ($89 million versus $74 million in assets), de novo affiliates of affiliates of MBHCs may have access to a wider range of investment opportunities through their parent organizations. Apparently, small business lending fits less well into the business strategies of MBHCs; equivalently, there may be managerial constraints in larger banking organizations that make small business lending more difficult for them than for smaller banks (Berger et al., 1998).

SIZESBL. The average size of a bank's small business customers (SIZESBL) appears to be an important determinant of the percentage of its assets devoted to small business loans. The coefficients on both SIZESBL and SQSIZE are highly significant and indicate an inverted parabolic shape that peaks at a loan size of about $390 thousand, far above the average loan size of $46 thousand. Thus, small business loan volume increases with loan size for the vast majority of the banks in our sample, but does so at a decreasing rate.

The most successful small business accounts are the most likely to grow over time. Small banks are likely to lose some of these accounts to other financial services firms.

It is also possible that large values of SIZESBL indicate that the bank's business strategy has matured. By this logic, a "mature" bank would continue to service its existing small business clients, reduce its effort devoted to cultivating new small business clients to replace lost accounts, and instead concentrate on investment opportunities that were not available to it when it was newly chartered. In this scenario, the "left-over" small business loans will be relatively large in size, even though the percentage of the bank's assets devoted to small business loans declines. (Note that the AGE variables will not fully capture this phenomenon because some banks, like human adolescents, are late-bloomers.) These two effects might help explain why SBLASS declines over time, and we will return to this question after a further exploration of whether the coefficients of our basic regression are stable for a number of dichotomous classifications of banks.

C. " Very young" banks versus "somewhat older" banks.

As the discussion immediately above indicated, relatively young banks appear to be different in a number of ways from older banks. Accordingly, we divided our sample into two groups: observations for banks that are four years or younger ("very young" banks), and observations for the banks that are older than four years but less than 25-1/2 years ("somewhat older" banks).[22] We then re-estimated the full variables model (with and without the STATEDUM variables) for these two groups of banks. These results are reported in Table 3.

Columns (1) and (2) indicate that, for the very young banks, the simple DeYoung result

[22] A "switching of regimes" investigation indicated that AGE=4 provided the maximum differentiation between the "younger" and "older" banks.

does not hold. Consistent with a visual inspection of Figure 2 for ages 1 through 4, the estimated relationship between bank age and the small business lending percentage is essentially zero. A number of the other explanatory variables also exhibit different signs. OFFICES was positive and significant in (2), suggesting that a branch network may lend some initial credibility to young banks trying to establish a small business practice. Increases in HHI still have a decreasing effect on SBLASS in rural markets and an increasing effect in urban markets, but being located in an URBAN market now has a slightly negative impact on small business lending[23] when evaluated at the average urban HHI of 0.16. Being part of a multi-bank holding company at the time of inception (YR1MBHC) has a stronger negative influence on the small business lending of these very young banks than does converting to MBHC status a few years in later. Finally, SIZESBL has a positive effect on the small business percentage, and this effect does not diminish as loan size increases (i.e., the coefficient on SIZESQ is insignificant in (1) and is positive in (2)). This result for very young banks is consistent with our discussion above of business strategies that mature over time.

By contrast, the results for the somewhat older banks, reported in columns (3) and (4) of Table 3, are roughly similar to the results for the overall sample that were described above. The differences between the very young banks and the somewhat older banks are significant: An F-test rejects the null hypothesis that the structure of the model is the same for the two groups of banks.

[23] This result is contrary to the results reported by Goldberg and White (1998).

D. Freestanding banks versus MBHCs.

As the earlier discussion indicated, being part of a MBHC does seem to make a difference in a bank's lending behavior. To examine this possibility more extensively, we again divided the sample into two groups: observations on freestanding banks, and observations on banks that are part of a MBHC. We then re-estimated the basic set of regressions for these two groups. The results are reported in Table 4.

As can be seen in Columns (1) and (2), the results for freestanding banks are largely similar to those of the overall sample. The results for MBHC banks shown in columns (3) and (4) are somewhat different. The coefficient on HHI is insignificant, which implies that higher concentration in rural markets does not discourage MBHC de novos from making small business loans. This may simply reflect a difference in product mix between free-standing and MBHC banks: If rural MBHC de novos are less likely than freestanding rural de novos to have agricultural lending strategies (which seems likely), they will be more likely to have small C&I customers even in "super-rural" markets. In contrast, the combined HHI and URBANHHI coefficients indicate that increased concentration in urban markets has a stronger impact on MBHC banks than on freestanding banks. The two groups of banks (freestanding and MBHC) are different: An F-test rejects the null hypothesis that the structure of the model is the same for the two groups. This difference is not too surprising. Arguably, since banks that begin their lives as part of MBHCs are already part of a larger organization, in an important sense they are not really de novo banks.

E. Urban banks versus rural banks.

Our earlier discussion indicated that differences between urban and rural banks appeared to make a difference with respect to their small business lending; in particular, the effects of HHI were generally positive for urban banks but were negative for rural banks. This result for urban banks would be consistent with the relationship-lending hypotheses of Lang and Nakamura (1989) and of Petersen and Rajan (1994, 1995). To explore these potential differences further, we divided our sample into observations for urban banks and observations for rural banks, and we re-estimated our basic regressions for each group. The results are reported in Table 5.

As can be seen, AGE has a stronger negative effect for urban banks than for rural banks. Also, bank size (ASSETS) has a significant negative effect for urban banks, but has virtually no effect for rural banks. In addition, a bank's recent growth is negatively related to its small business lending for urban banks but is irrelevant for rural banks. Considered together, these three results suggest that, even though an urban bank is more likely than a rural bank to include small business lending as part of its start-up strategy, it is likely to abandon this strategy more quickly. Higher HHI has the expected strong positive and significant effect for urban banks, but a significant negative effect on rural banks' small business lending. Finally, a bank's association with a MBHC has a negative effect for urban banks (as does the bank's original association with the MBHC), whereas the MBHC presence has virtually no effect on rural banks' small business lending (except for the significant effect of YR1MBHC in the model that includes the STATEDUM variables). The differences between the two groups of banks are significant: An F-test rejects the null hypothesis that the structure of the model is the same for the two groups.

F. Further explorations of the effects of age.

Our regression results thus far have indicated that a bank's age generally remains as a significant and negative explanatory influence on its small business lending, even after other important influences have been taken into account; the only exception was the group of "very young" ($AGE \leq 4$) banks. In this section we explore some further possible explanations for this negative effect of age.

First, it might be the case that as a bank grows older its small business borrowers grow rapidly, and their loan renewals increase in value and exceed the $1 million classification threshold. Since the average size of a small business loan in our sample is about $46 thousand, this effect seems unlikely. Still, if there were a tendency in this direction, we would expect to see a positive relationship between AGE and SIZESBL. Instead, as can be seen in Figure 3, the average size of small business loans (for the median bank in each age cohort) declines as a bank grows older, at least through $AGE = 10$. The regression results in column (1) of Table 6 confirm this result, when other potential influences are taken into account.[24] Thus, the tendency of the size of small business loans to decline as a bank grows older reinforces the decline (with age)

[24] Why might the size of a bank's small business loans decline as the bank gets older? We offer a few tentative hypotheses. First, the initial loans to a community's small businesses may be the driving force underlying the start-up of a de novo bank. Once these loans have been made, the bank may have more difficulty in finding suitable small business borrowers, and the additional loans may tend to be small. Second, a de novo bank that tends to make larger loans may tend to fail quickly or to disappear through merger. Third, some small business loans amortize; if a bank begins with a small-business-lending strategy but then switches to a different type of lending or investment strategy, then this amortization will cause the average size of the bank's small business loans to decline as the bank ages. We leave further exploration of these hypotheses to future research.

in the overall ratio of small business loans to a bank's assets.[25]

Second, older banks may substitute different kinds of loans (e.g., consumer loans or real estate loans) or different kinds of assets (e.g., government securities) for small business loans. To test these possibilities, we form the ratios SBLLOANS (a bank's small business loans as a percentage of its total loans) and LNTOASS (a bank's entire loan portfolio as a percentage of its total assets). As Figures 4 and 5 indicate, both effects appear to be at work. SBLLOANS declines with bank age, which suggests that de novo banks substitute away from small business lending toward other types of lending as they mature. The long-run decline in LNTOASS, however, suggests that the substitution within the loan portfolio is less than dollar-for-dollar. The regressions in columns (2) and (3) of Table 6 confirm these results.[26] Older banks do seem to pursue alternative strategies.

G. How much does it matter?

We have shown that the inclusion of other potential influences on de novo banks' small business lending has the effect of diminishing somewhat the effects of the bank's age but does

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[25] A few other results from column (1) are worth noting: Larger banks tend to have larger small business loans, reaching a peak for banks that are about $400 million in assets; urban banks, banks with higher HHIs, faster growing banks, and banks that are associated with MBHCs tend to have larger small business loans.

[26] Other results from these regressions that are noting: The ratio of small business loans to all of the bank's loans is negatively related to the size of the bank, negatively related to association with a MBHC, and is positively related to the average size of the bank's small business loans (with an inverted parabola shape). The ratio of all loans to a bank's assets is negatively related to the size of the bank, positively related to the number of branches, negatively related to the bank's recent growth, and negatively related to association with a MBHC; the ratio rose significantly (controlling for other influences) in 1994 and the two subsequent years, which probably reflected the improved business climate of the U.S. economy in these years (as compared with 1993).

not eliminate age as an important factor. For example, for de novo banks in urban markets (where most bank lending to small business occurs), the regression estimates of column (1) in Table 5 indicate that an additional year of age[27] reduces the asset share of small business loans by about 0.20 percentage points (-0.25+0.003*18=0.196). We have also shown that increased concentration in urban markets is associated with increases in small business lending by these banks. Based on the same regression equation, an increase in the HHI of 0.01 would increase their small business lending asset share by 0.11 percentage points (11.32*0.01=0.11).

How quantitatively important are these estimates? The total assets of all "young" (i.e., AGE$\leq$25.5) banks in our sample in urban markets was $120 billion. Thus, ceteris paribus, an extra year of aging by incumbents would reduce their collective small business lending by somewhat more than $200 million, while an increase of 0.01 in the HHI (which is within the range of changes described by Rhoades [1995] for urban banking markets over the past decade) would increase the collective small business lending by these incumbents by somewhat more than $100 million.[28] Since small business lending by all urban banks in 1996 was $143 billion, these magnitudes are relatively small. But these calculations neglect the (likely negative) effects that mergers of large banks (which are the main source of the increases in HHI) would have on small business lending, as well as the positive effects of the annual flow of de novo entrants.

The decrease in small business lending that accompanies a bank's aging and increase in

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[27] If the bank is part of a MBHC, the decline would be 0.15 percentage points, since the coefficient on AGEM was +0.04.

[28] These figures are likely to be under-estimates, since our sample selection process (described in Section IV) excluded a non-trivial number of banks. Also, these figures assume that the effects of aging are complete by age 25 and that changes in the technology of small business lending (e.g., credit scoring) will not change the distribution of small business lending across banks by size and/or age.

size need not be just a socially efficient adaptation by banks to increased opportunities and changed circumstances. Since small businesses are informationally quite opaque, the process of lending to them is idiosyncratic and imperfect at best. In this environment of second best, it is unclear as to what social efficiency conclusions should be drawn from observations of these changes.

VI. Conclusion

The availability of credit to small businesses is likely to remain an important topic for public policy and also for research, especially in an era of substantial consolidation of banking. Small business lending is a primary line-of-business for young banks. Thus, studying the behavior of commercial banks as they are born, grow older, and evolve into mature institutions is crucial to understanding the supply of credit available to small businesses.

In this paper, we have been able to extend the work of Goldberg and White (1998) and DeYoung (1998). These two previous studies find that (a) de novo banks make more small business loans than do otherwise comparable incumbent banks, but that (b) their enthusiasm for small business lending diminishes over time, and after about 20 years de novo banks revert to the behavior of incumbent banks. We support the results of these two studies in this paper, but then go further by including a number of age-related variables in our tests -- variables for which bank age could have been a proxy in the earlier studies. We show that the negative relationship between bank age and small business lending is weakened, but does not disappear entirely, after

controlling for these other variables. Indeed, bank age is a proxy for other determinants of small business lending, but it does persist as an independent predictor of small business lending by commercial banks.

We find that the size of a bank is a negative influence on its small business lending, which is consistent with the findings of a number of previous studies. The existence of multiple branches does not seem to affect a bank's small business lending. Importantly, the effects of higher concentration (i.e., fewer banks with higher market shares) in a market is different in rural markets (where concentration is already quite high) than in urban markets (where concentration is considerably lower). In the latter markets, higher concentration has a positive effect on small business lending,[29] consistent with the findings of Lang and Nakamura (1989) and Petersen and Rajan (1994, 1995), whereas it has a modest negative effect in rural markets. Also, we find that banks that are a part of a multibank holding company (MBHC) are less inclined to make small business loans than are otherwise similar freestanding banks.

For public policy, one immediate implication is that a continuing stream of de novo banks may be important for ensuring that adequate credit is provided to small businesses.[34] Unrestricted entry (so long as safety-and-soundness regulatory standards are maintained) is generally good public policy; this is one more piece of support for that position. However, our

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[29] As was noted above, this positive effect of higher HHI is observed for the relatively young and modest sized banks in our sample. Significant increases in HHI in urban areas are likely to be caused by mergers among already sizable banks, which are likely to have a negative effect on their small business lending, for the reasons discussed in Berger et al. (1998).

[44] Even in urban markets, where our findings indicate that higher HHI is associated with more small business lending by relatively young banks, the change in HHI caused by additional de novo banks would likely be quite small, whereas their addition to the market would clearly add to small business lending.

findings indicate that not all de novos are created equal. Freestanding de novo banks make substantially more small business loans than do otherwise similar banks that begin as a part of a MBHC.

As for future research, we believe that further explorations into the evolution and life cycle of banks would yield high dividends. Potential areas of exploration include other parts of a bank's balance sheet and other bank activities.

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Table 1: Means and Ranges of the Variables

Variable	Brief definition	Mean	Minimum	Maximum
SBLASS	The ratio of bank's small business loans divided by its assets, expressed as a percentage	11.99	0.01	61.53
AGE	The age of the bank (in years)	12.40	0.50	25.42
ASSETS	Total assets of the bank (in millions of 1996 dollars)	$70.62	4.21	497.92
SQASS	ASSETS*ASSETS	10,991.14	17.70	247,923.33
YR94, YR95, YR96	1,0 dummy variables indicating the year of observation (1993 is the base year)	0.22-0.26	0.00	1.00
OFFICES	The number of branch locations of the bank, including its home office	2.77	1.00	39.00
URBAN	1,0 dummy variable indicating whether the bank is headquartered in an MSA	0.71	0.00	1.00
HHI	The Herfindahl-Hirschman Index of concentration of the market where the bank is headquartered	0.16	0.02	1.00
URBANHHI	URBAN*HHI	0.08	0.00	0.39
GROWTH5	Average annual growth rate of the bank's assets in the most recent five-year period, expressed as a percentage	16.26	-36.69	100.00
MBHC	1,0 dummy variable indicating whether the bank is part of a multi-bank holding company	0.22	0.00	1.00
YR1MBHC	1,0 dummy variable indicating whether the bank was a part of a MBHC at the time that the bank began its operations	0.09	0.00	1.00
SIZESBL	Average size of the bank's small business loans (in millions of 1996 dollars)	$0.046	0.0014	1.071
SQSZSBL	SIZESBL*SIZESBL	0.004	2.14E-6	1.147
AGEG	AGE*GROWTH5	128.59	-448.90	2466.67

Table 1 (continued)

Variable	Brief Definition	Mean	Minimum	Maximum
AGEM	AGE*MBHC	2.91	0.00	25.42
STATEDUM	1,0 dummy variables indicating whether a bank is headquartered in a particular state	0.0006-0.12	0.00	1.00
SBLLOANS	The ratio of a bank's small business loans divided by its total loans, expressed as a percentage	20.30	0.03	100.00
LNTOASS	The ratio of all of a bank's loans divided by its total assets, expressed as a percentage	59.41	0.007	99.00

Table 2: Random-Effects Regressions, the Full Sample
(SBLASS as dependent variable; t-statistics in parentheses)

	(1)	(2)	(3)	(4)
const.	14.78 (44.74)	13.20 (21.06)	14.10 (21.71)	12.53 (16.92)
AGE	-0.22 (9.84)	-0.17 (6.95)	-0.22 (8.25)	-0.23 (8.54)
ASSETS	-0.002 (0.69)	-0.01 (3.63)	-0.02 (4.89)	-0.02 (4.64)
SQASS	-0.10E-4 (1.15)	-4.72E-6 (0.54)	1.34E-5 (1.51)	1.12E-5 (1.29)
YR94	-0.09 (0.12)	0.03 (1.29)	0.03 (0.29)	0.02 (0.21)
YR95	0.21 (1.78)	0.15 (1.29)	0.17 (1.44)	0.24 (2.16)
YR96	0.73 (5.55)	0.62 (4.77)	0.65 (5.02)	0.72 (5.66)
OFFICES	-	0.06 (1.29)	0.04 (0.84)	0.03 (0.73)
URBAN	-	-0.77 (1.24)	-0.67 (1.08)	1.34 (2.09)
HHI	-	-4.38 (2.68)	-4.57 (2.80)	-2.43 (1.52)
URBANHHI	-	12.23 (3.76)	11.73 (3.61)	1.45 (0.34)
GROWTH5	-	0.003 (0.73)	-0.02 (3.12)	-0.02 (3.46)
MBHC	-	-0.62 (2.62)	-1.19 (2.26)	-1.48 (2.93)
YR1MBHC	-	-1.93 (3.63)	-1.81 (3.29)	-1.94 (3.52)
SIZESBL	-	49.84 (18.94)	50.45 (19.27)	49.57 (19.60)
SQSZSBL	-	-64.25 (15.32)	-64.86 (15.54)	-63.89 (15.90)
AGEG	-	-	0.003 (5.30)	0.003 (5.58)
AGEM	-	-	0.04 (1.27)	0.07 (2.21)
STATEDUM	-	-	-	*
R^2	0.04	0.11	0.11	0.19
n	7954	7954	7954	7954

* An F-test rejects the null hypothesis that the vector of coefficients on the STATEDUM variables is jointly equal to zero.

Table 3: Random-Effects Regressions, "Very Young" and "Somewhat Older" Banks
(SBLASS as dependent variable; t-statistics in parentheses)

	"Very Young" Banks		"Somewhat Older" Banks	
	(1)	(2)	(3)	(4)
const.	12.21 (6.73)	18.04 (4.64)	14.20 (20.72)	12.52 (16.30)
AGE	0.21 (0.58)	0.06 (0.30)	-0.23 (8.18)	-0.25 (8.62)
ASSETS	-0.05 (4.12)	-0.05 (9.40)	-0.02 (4.03)	-0.02 (3.84)
SQASS	5.76E-5 (1.54)	1.32E-5 (2.63)	9.14E-6 (1.20)	7.89E-6 (0.89)
YR94	0.03 (0.12)	0.05 (0.26)	0.02 (0.18)	0.03 (0.25)
YR95	-0.49 (1.06)	-0.33 (0.88)	0.22 (1.87)	0.33 (2.76)
YR96	-0.42 (2.69)	-0.64 (1.16)	0.67 (5.07)	0.79 (5.92)
OFFICES	0.24 (1.16)	0.53 (6.40)	0.03 (0.56)	0.02 (0.46)
URBAN	-4.20 (2.69)	-5.44 (7.94)	-0.47 (0.71)	1.66 (2.44)
HHI	-8.60 (1.85)	-4.47 (2.29)	-4.21 (2.48)	-1.74 (1.04)
URBANHHI	25.12 (3.02)	8.74 (2.26)	10.80 (3.14)	0.26 (0.07)
GROWTH5	-0.01 (1.04)	-0.03 (6.33)	-0.01 (1.11)	-0.01 (0.98)
MBHC	-0.31 (0.19)	-0.48 (0.90)	-1.17 (2.05)	-1.51 (2.71)
YR1MBHC	-3.51 (2.19)	-4.76 (4.01)	-1.26 (2.16)	-1.37 (2.34)
SIZESBL	105.07 (7.15)	70.90 (14.04)	44.02 (16.74)	43.38 (16.87)
SQSZSBL	-79.88 (1.06)	166.54 (6.42)	-58.09 (14.20)	-57.45 (14.43)
AGEG	0.01 (3.03)	0.01 (9.50)	0.003 (3.30)	0.003 (3.18)
AGEM	0.11 (0.35)	0.22 (1.94)	0.04 (1.11)	0.07 (2.02)
STATEDUM	-	*	-	*
R^2	0.12	0.18	0.10	0.19
n	844	844	7110	7110

* An F-test rejects the null hypothesis that the vector of coefficients on the STATEDUM variables is jointly equal to zero.

Table 4: Random-Effects Regressions, Freestanding and MBHC Banks
(SBLASS as dependent variable; t-statistics in parentheses)

	Freestanding Banks		MBHC Banks	
	(1)	(2)	(3)	(4)
const.	13.68 (18.72)	12.40 (15.23)	12.67 (9.83)	9.82 (6.17)
AGE	-0.21 (7.21)	-0.24 (8.07)	-0.19 (3.74)	-0.008 (1.62)
ASSETS	-0.02 (3.45)	-0.02 (3.15)	-0.02 (2.29)	-0.02 (3.18)
SQASS	6.49E-6 (3.78)	1.89E-6 (0.17)	7.45E-6 (0.52)	1.36E-5 (1.00)
YR94	-0.07 (0.61)	-0.05 (0.50)	0.26 (1.21)	0.19 (0.93)
YR95	0.10 (0.75)	0.23 (1.87)	0.31 (1.25)	0.25 (1.04)
YR96	0.50 (3.38)	0.65 (4.64)	0.89 (3.16)	0.73 (2.75)
OFFICES	0.04 (0.73)	0.04 (0.68)	0.001 (0.12)	0.005 (0.06)
URBAN	-1.20 (1.68)	0.83 (1.15)	0.02 (0.02)	1.37 (1.11)
HHI	-5.92 (3.10)	-3.49 (1.89)	-1.94 (0.67)	-1.67 (0.56)
URBANHHI	13.10 (3.41)	1.48 (0.38)	12.29 (2.12)	6.30 (1.02)
GROWTH5	-0.02 (2.97)	-0.02 (3.39)	-0.03 (1.98)	-0.02 (1.64)
MBHC	-	-	-	-
YR1MBHC	-	-	-2.35 (3.38)	-1.79 (2.50)
SIZESBL	69.35 (19.95)	68.84 (21.32)	37.80 (6.96)	45.94 (8.34)
SQSZSBL	-114.87 (15.65)	-115.94 (16.86)	-61.09 (7.05)	-86.24 (8.92)
AGEG	0.005 (5.83)	0.005 (6.06)	0.002 (2.02)	0.002 (2.19)
AGEM	-	-	-	-
STATEDUM	-	*	-	*
R^2	0.11	0.19	0.09	0.26
n	6302	6302	1652	1652

* An F-test rejects the null hypothesis that the vector of coefficients on the STATEDUM variables is jointly equal to zero.

Table 5: Random-Effects Regressions, Urban and Rural Banks
(SBLASS as dependent variable; t-statistics in parentheses)

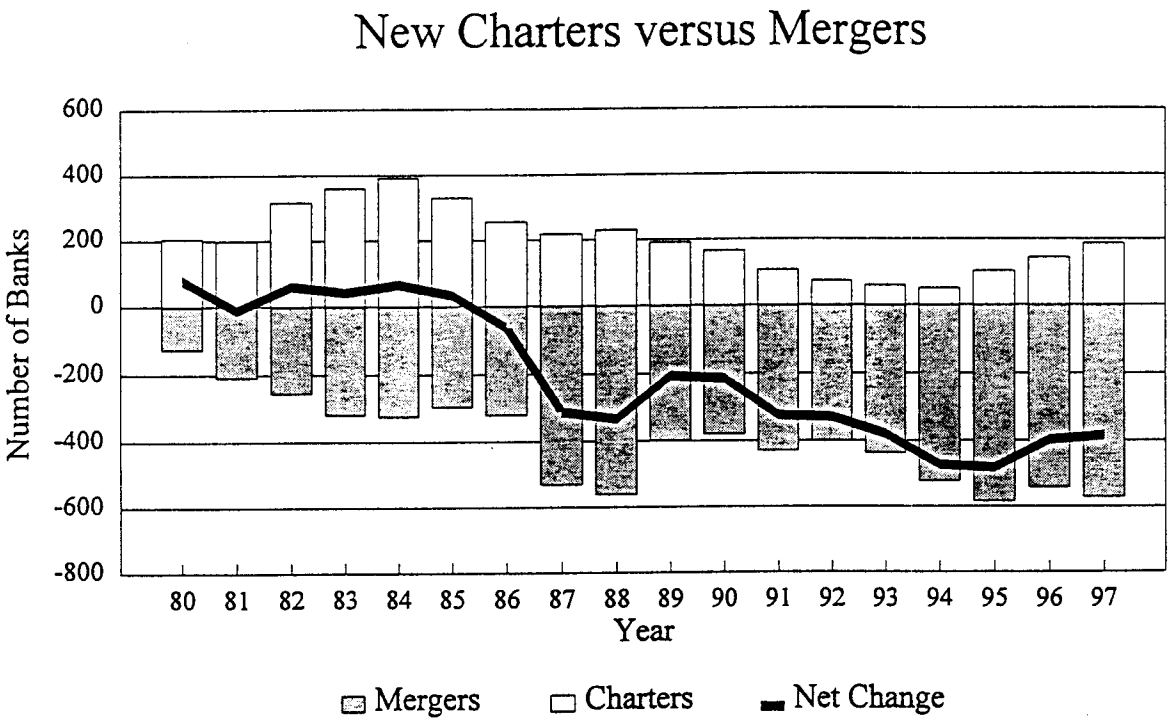
	Urban Banks		Rural Banks	
	(1)	(2)	(3)	(4)
const.	13.76 (22.24)	14.42 (19.01)	10.77 (13.79)	8.91 (10.06)
AGE	-0.25 (7.43)	-0.25 (7.30)	-0.12 (2.97)	-0.16 (4.07)
ASSETS	-0.02 (4.63)	-0.02 (4.76)	-0.006 (0.75)	-0.004 (0.68)
SQASS	1.95E-5 (1.87)	1.87E-5 (1.85)	-1.82E-5 (0.97)	-1.92E-5 (1.61)
YR94	-0.07 (0.54)	-0.09 (0.67)	0.16 (1.35)	0.20 (2.64)
YR95	-0.10 (0.64)	-0.0001 (0.004)	0.58 (3.99)	0.64 (6.30)
YR96	0.40 (2.32)	0.49 (2.91)	0.97 (5.68)	1.04 (7.80)
OFFICES	0.05 0.85	0.05 (0.88)	-0.06 (0.74)	-0.07 (1.27)
URBAN	-	-	-	-
HHI	11.32 (3.62)	3.56 (0.99)	-3.79 (2.75)	-1.66 (1.53)
URBANHHI	-	-	-	-
GROWTH5	-0.02 (3.23)	-0.03 (3.64)	-0.007 (0.76)	-0.005 (0.87)
MBHC	-1.49 (2.22)	-1.73 (2.69)	-0.46 (0.66)	-0.62 (1.52)
YR1MBHC	-1.94 (2.97)	-1.89 (2.85)	-1.00 (1.02)	-2.67 (2.77)
SIZESBL	51.24 (15.95)	50.15 (16.26)	76.16 (13.41)	70.73 (21.58)
SQSZSBL	-63.44 (13.23)	-62.22 (13.55)	-200.75 (10.85)	-184.86 (17.49)
AGEG	0.003 (4.37)	0.004 (4.71)	0.003 (3.52)	0.003 (4.68)
AGEM	0.04 (1.10)	0.07 (1.64)	0.01 (0.27)	0.03 (1.34)
STATEDUM	-	*	-	*
R^2	0.10	0.18	0.10	0.27
n	5687	5687	2267	2267

* An F-test rejects the null hypothesis that the vector of coefficients on the STATEDUM variables is jointly equal to zero.

Table 6: Random-Effects Regressions, the Full Sample
(various dependent variables; t-statistics in parentheses)

	dep. var.: SIZESBL (1)	dep. var.: SBLLOANS (2)	dep. var.: LNTOASS (3)
const.	0.02 (5.77)	23.82 (20.08)	5.01 (44.22)
AGE	-2.30E-4 (1.84)	-0.31 (7.10)	-0.19 (4.65)
ASSETS	1.06E-4 (9.10)	-0.03 (4.47)	-0.02 (3.90)
SQASS	-1.35E-7 (5.55)	2.64E-7 (1.99)	2.18E-6 (0.21)
YR94	-9.29E-4 (3.64)	-0.27 (1.87)	1.24 (11.20)
YR95	-0.002 (5.23)	-0.07 (0.40)	2.08 (15.10)
YR96	-2.95E-4 (0.67)	0.34 (1.78)	3.22 (19.63)
OFFICES	-1.32E-4 (1.00)	-0.06 (0.86)	0.27 (4.58)
URBAN	0.02 (7.59)	2.39 (2.36)	1.36 (1.51)
HHI	0.02 (4.06)	-2.16 (0.85)	-1.39 (0.60)
URBANHHI	-0.06 (5.61)	2.08 (0.40)	-6.45 (1.46)
GROWTH5	0.0001 (7.62)	-0.01 (0.16)	-0.06 (8.18)
MBHC	0.01 (9.18)	-1.44 (1.87)	-2.70 (4.50)
YR1MBHC	-0.006 (2.00)	-3.28 (3.62)	0.32 (0.35)
SIZESBL	-	76.31 (20.12)	21.22 (7.37)
SQSZSBL	-	102.00 (16.80)	-23.37 (4.97)
AGEG	-6.00E-4 (3.52)	0.001 (1.36)	0.01 (13.05)
AGEM	-4.74E-4 (5.30)	0.06 (1.17)	0.15 (3.80)
STATEDUM	*	*	*
R^2	0.16	0.17	0.17
n	7954	7954	7954

Figure 1



Data sources: OCC, FDIC

Figure 2

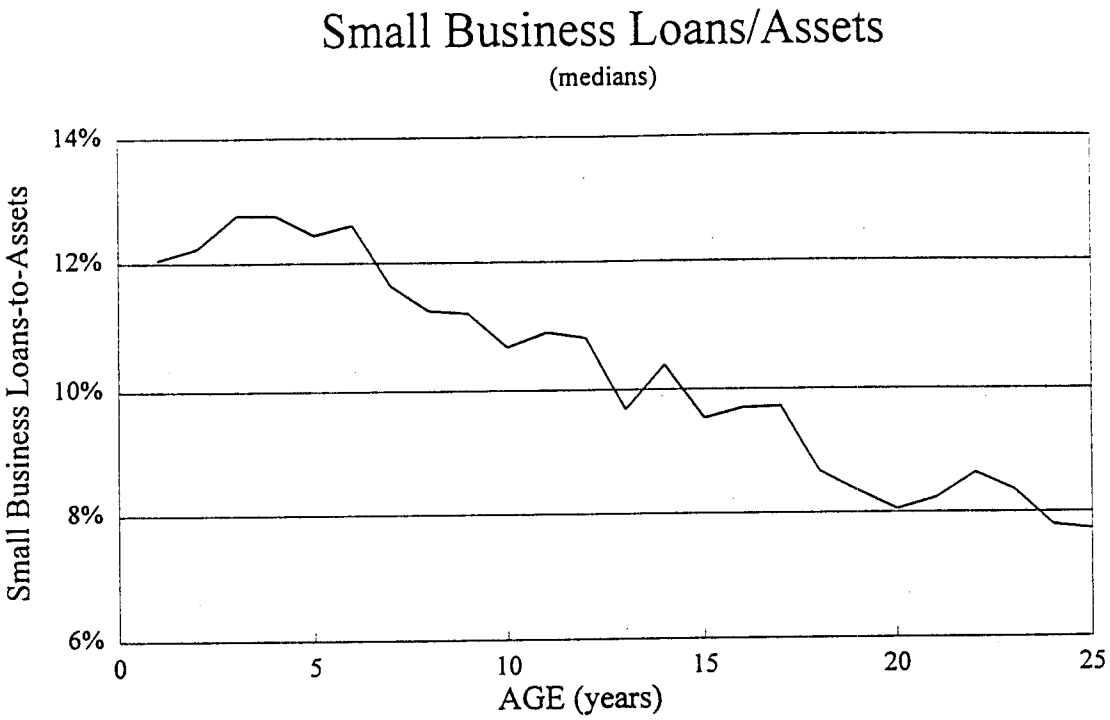

Small Business Loans/Assets
(medians)
Small Business Loans-to-Assets
14%
12%
10%
8%
6%
0
5
10
15
20
25
AGE (years)

Figure 3

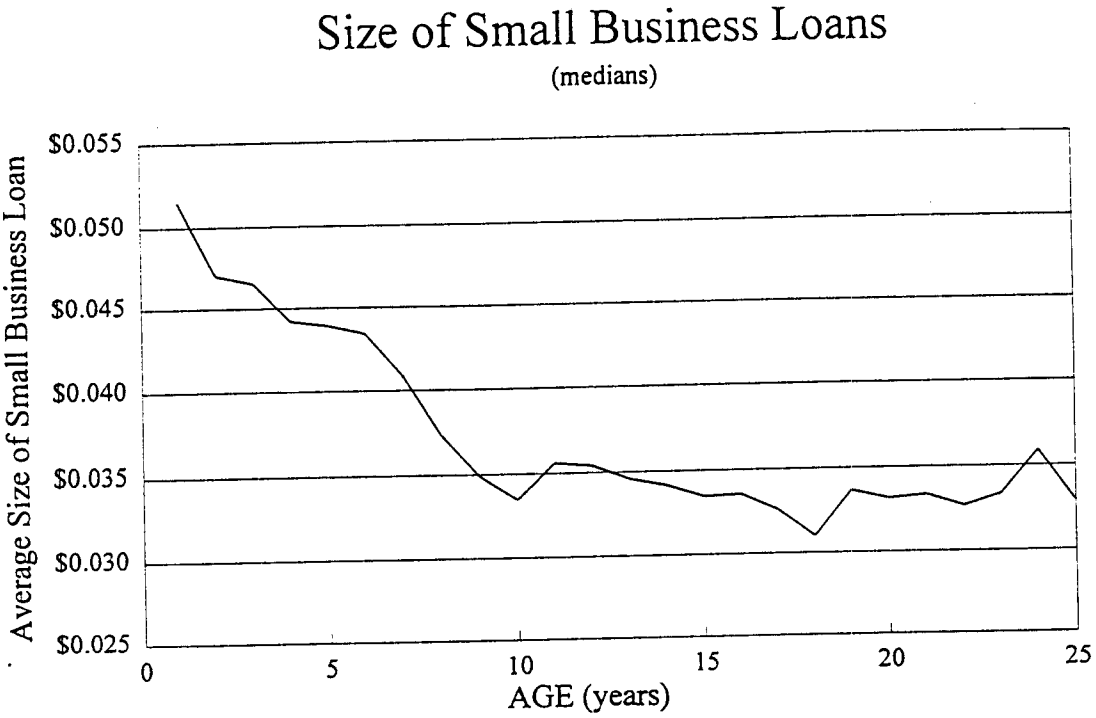

Size of Small Business Loans
(medians)
Average Size of Small Business Loan
$0.055
$0.050
$0.045
$0.040
$0.035
$0.030
$0.025
0
5
10
15
20
25
AGE (years)

Figure 4

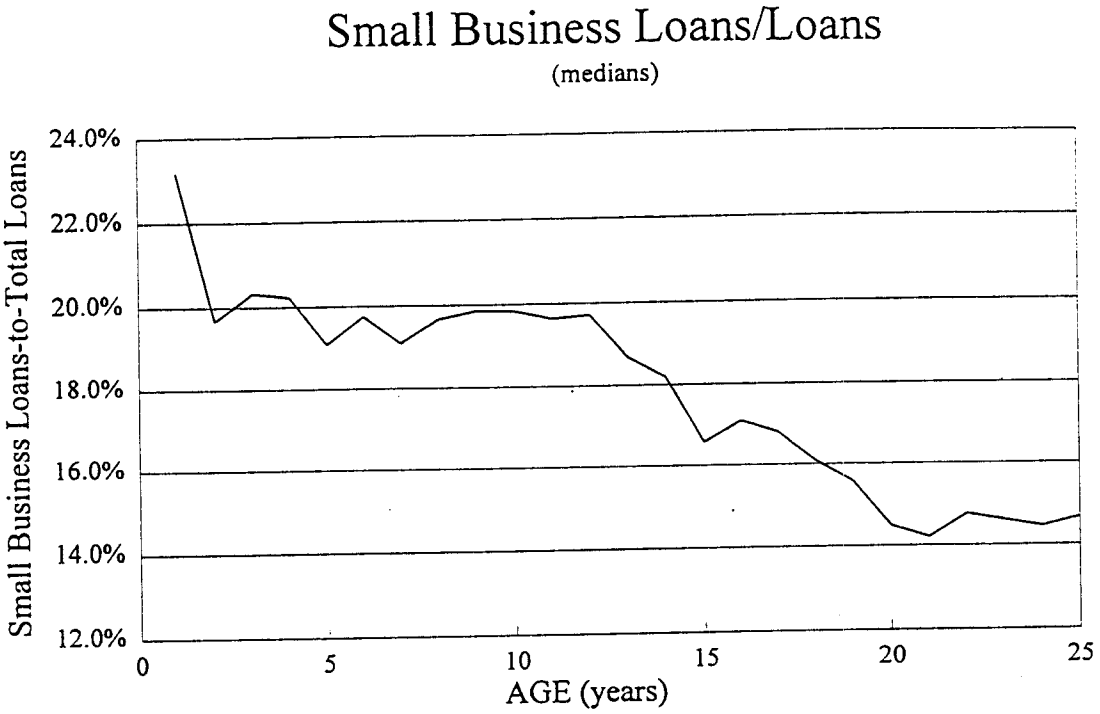
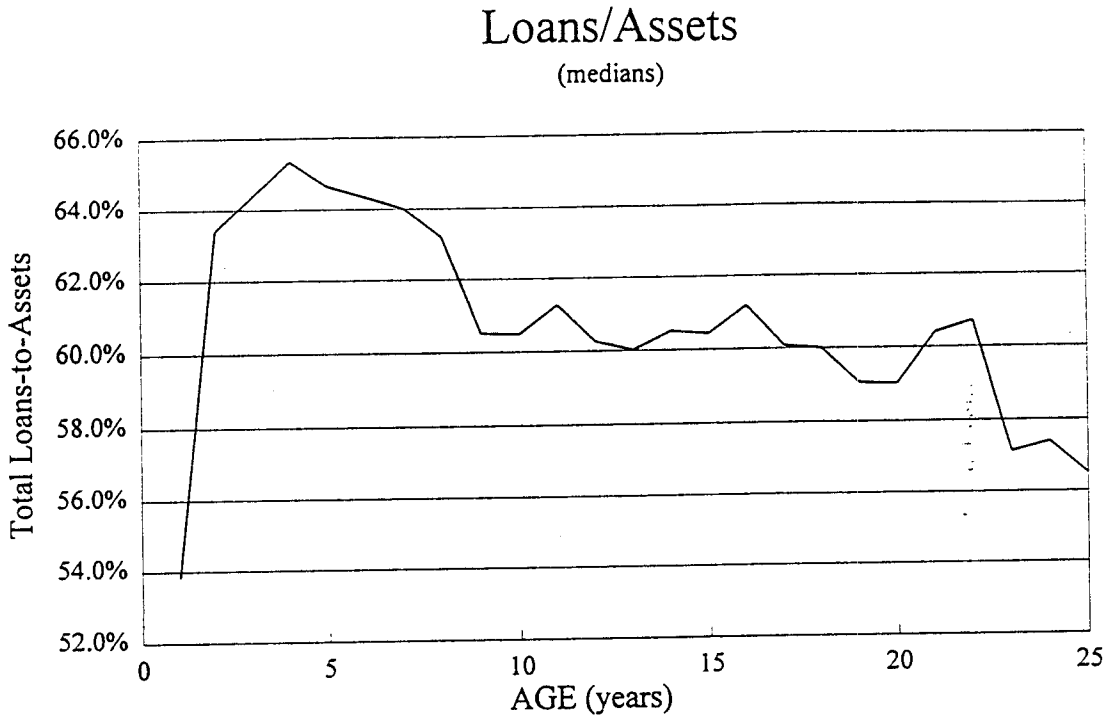

Small Business Loans/Loans
(medians)
Small Business Loans-to-Total Loans
24.0%
22.0%
20.0%
18.0%
16.0%
14.0%
12.0%
0
5
10
15
20
25
AGE (years)

Figure 5


Loans/Assets
(medians)
66.0%
64.0%
62.0%
60.0%
58.0%
56.0%
54.0%
52.0%
Total Loans-to-Assets
0
5
10
15
20
25
AGE (years)