A Two-step Analysis of Standardized Versus Relationship Bank Lending to Small Firms

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Purpose

Since small firms have very limited access to the publicly traded capital markets, these firms are very dependent upon commercial banks for financing. This, coupled with small firms being a strong engine for growth in the U.S. economy, warrants an environment of efficient capital allocation to these firms promoted by adequate bank credit.

In the past, lending to small businesses has been the province of small banks, as these banks possessed a comparative advantage in the small business loan market. That is, the structure of the smaller, simpler banking organization was more amenable to overcome the greater information asymmetries inherent in small firm financing. The information asymmetries were mitigated by the small bank's proprietary relationship with the small business borrower, through a process termed in the literature as relationship lending. However, technological advancements have narrowed that information gap, thus allowing large banking organizations to become more prominent in this market through standardized lending practices such as credit scoring. As consolidation in the financial service industry continues, banks have become larger, with the number of small banks shrinking. With this structural change in the financial sector, the question of adequate credit to small firms continues to be an important economic policy issue, as large and small banks supply funds under different lending techniques.

This analysis addresses that issue through a unique examination of evidence of standardized versus relationship lending methods in both total bank credit as well as credit emanating from the firm's most important source of financial services, its primary bank. It contributes to the literature by using proprietary data associated with the 1998 Survey of Small Business Finances Survey combined with banking data to produce a bank-firm match, thus allowing for a study of the banking structure at both the local market and credit provider level. Furthermore it analyzes total bank debt, whereas established studies focus on firm level debt of a particular credit instrument. Using a Heckman methodology, the adequacy of credit availability under the two diverse lending methods is explored.

Overall Findings

The study reveals that relationship lending is inherent within the primary bank provider, whereas competing bank sources tend to employ standardized lending techniques such as credit scoring. Relating to credit availability, however, no clear dominance of one method over the other prevails.

Highlights

• Bank structure in the local market affects the likelihood of small firms having debt more so than the amount of debt provided by the source bank.

• Large banking organizations reduce the likelihood of firm debt within the local market, but have insignificant effects as the source supplier of credit levels to firms.

• Unit banks reduce both the likelihood of firm debt within the local bank market, and the levels of credit as the source banks. However, unit banks within large bank holding companies manifest apparent credit scoring, by higher credit levels from multiple bank sources.

• Primary bank credit levels are little affected by source bank structure, a result attributed to the relationship lending inherent in these institutions.

• Years with the source primary bank indicate the credit levels improve with a shorter relationship of this measure.

• Results from the firm characteristic variables underscore the evidence from the banking variables that multiple bank sources appear to utilize standardized lending practices such as credit scoring, with the primary bank engaging in relationship lending. This is particularly so with the ostensibly more cash constrained firms.

Methodology

The analysis relies on data from two sources, the demander of credit by small firms and the supplier of credit by banks. The latter is taken from the FDIC Summary of Deposits profiling bank data throughout the U.S. The firm data is extracted from the 1998 Survey of Small Business Finances (Survey), a nationally representative, weighted sample of small firms designed to reflect the target population of small, non-financial firms operating for profit within the United States. Besides firm demographics and broad financial statement variables, the Survey reflects the financial products and institutional sources used by each firm.

In the public data of the Survey, the identity of the financial institution is not revealed, only its type. They are commercial banks and thrifts, credit unions, mortgage companies, finance and leasing companies, brokerage houses, and insurance companies. The financial products are varied services offered by these institutions, but this analysis focuses only on bank debt. This is debt from commercial banks, savings banks as well as savings and loans, since these are the main providers of credit to small businesses. The credit instruments in the Survey are classified into six categories: Lines of Credit, Mortgages, Equipment Loans, Motor Vehicle Loans, Capital Leases and Other Loans—loans not of the preceding types (primarily unsecured term loans). The debt is determined by aggregating the individual credit instruments from all bank sources as well as those from just the firms' primary bank. This methodology coupled with the proprietary nature of the bank-firm match is part of the unique contribution of this study to the research community.

The model utilizes a two-step Heckman process at the firm level to control for sample selection estimation bias. The first step estimates the probability of a small firm obtaining credit, while the second step estimates normalized levels of credit for those firms having debt. A Heckman analysis is employed because there are reasons to consider that the decision whether to carry debt may have separate components than the decision concerning the level of debt. That is, the incentives to the financial institution provider in supplying credit may not be consistent with the demand preferences for debt by firms. Thus by explicitly modeling the decision process of the likelihood of debt in a Probit selection equation as a separate step from the decision of debt levels (conditional on firms' having debt) in a linear equation, the differences in lending/borrowing behavior at both stages of the funding process are captured

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ABSTRACT

Using the 1998 Survey of Small Business Finances and banking data to produce a bank-firm match, the author tests for evidence of standardized versus relationship lending methods in both total bank credit and credit emanating from the firm's most important source of financial services, its primary bank. The author employs a two-step Heckman procedure to test the likelihood a small firm has bank debt, then, conditional upon having debt, the level of credit outstanding. By comparing the determinants of bank and firm characteristics of primary bank credit with credit from all bank sources, she finds that relationship lending is inherent within the primary bank, whereas competing bank sources tend to employ standardized lending techniques such as credit scoring. With respect to credit availability, however, no clear dominance of one method over the other prevails.

I.   Introduction

As banking consolidation and technological innovation continue in the financial services industry, a dichotomy is evident in the manner in which commercial banks mitigate the information asymmetry between borrowers and lenders in the small business loan market. This dichotomy—the production technique most appropriate for supplying funds to small firms—is primarily a function of the structure of the banking organization. The technique dramatically differs in large organizations compared with their smaller counterparts.[1] It arises, in part, because of the nature of the small firm loan market. Inherent in small business lending is a more pronounced information asymmetry, since small firms are more opaque than relatively transparent large firms. The comparative advantage small banks have enjoyed in small business lending because of this opacity has been eroded by technological advances allowing for more efficient information gathering. Consequently, large organizations have made marked inroads into this loan category. Since most small firm borrowing is through commercial banks (Bitler, Robb and Wolken, 2001; Ang, 1991), the supplying of loanable funds by essentially two divergent production techniques is important.

On the one hand, large banks are primarily making loans to small firms by standardized methods.[2] This transaction-based technique includes financial statement lending, asset-based lending, and credit scoring. That is, loans are extended in this market based on a production function determining creditworthiness from "hard" information. This hard information is furnished by the firm in the loan application process, or is obtainable from other sources such as the bank's own credit file of the firm, or from a computerized loan-evaluation system referred to as credit scoring. It is a type of retail banking, analogous to consumer lending, and the process is generally impersonal. Because of

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[1] The banking organization refers to the consolidated bank holding company, which may encompass more than one bank, all operating under holding company policy. If no multi-bank holding company exists, the banking organization is essentially the bank itself. Consequently, banking organization and banks are used interchangeably throughout this paper.

[2] Standardized methods encompass a standardized lending process, where loan officers are given very little, if any, discretion. Generally, the loan application is approved based on a computer-generated credit review process, much like an application for a credit card. One method frequently used is credit scoring, where the software generates a credit score based on data from the loan application, and the loan is approved if the score is sufficient.

economies of scale, the cost to the large bank is relatively low compared with more personal, labor-intensive information gathering.

On the other hand, the small bank typically engages in what has been termed relationship lending. The bank's smaller scale generally prevents standardized lending from being cost-effective. Thus, the information asymmetry between borrower and lender is narrowed not solely by hard, quantitative data reflected in the firm's credit score, financial ratios, or collateral pledges, but is bridged by "soft" information gathered through more subjective processes during the course of the bank's relationship with the small firm. Some of the information is proprietary. For example, it is developed through personal interaction with firm owners and bank loan officers, through the firm's use of pre-existing bank products, through the firm's reputation in the community, or through the bank's knowledge of the local market. This soft information reduces risks and thus adds value beyond the firm's financial statements, collateral, and credit score. The gathering of this soft information underlies the relationship lending technique used by small banking organizations, and makes their production function in the small business loan market strikingly different from that used by larger banks.

Before technology advancements in credit scoring spurred standardized lending, small business credit was the province of small banks. Now, as the use of credit scoring has become more prevalent, small banks no longer dominate the arena of small firm debt. And with continued consolidation in the financial services industry, the number of small banks is shrinking. Therefore, considering inroads forged by large banks through standardized lending, this portion of the small business loan market may have a different face. With fewer small banks employing relationship lending and with small firms being a strong engine of economic growth, the policy question that arises is, "Will the small business loan market be adequately served?"

This question is addressed herein, with pertinent literature noted in section II as well as throughout the paper. Section III contains the data description and competing hypotheses. Section IV

presents the model and empirical methodology used in the analytical framework, followed by the

results, V, and finally, the conclusion and policy implications, VI.

II.   Literature Review

Many studies have found that small banks have an advantage in small firm lending (Carter and

McNulty 2005; Craig and Hardee, 2001; Peek and Rosengren, 1998). This is especially evident in the

area of relationship loans, or loans to firms not producing sufficient hard information for standardized

lending practices (Cole, Goldberg, and White, 2004; Scott, 2004; Berger and Udell, 2002; Berger, et al,

2002). Consequently, DeYoung, Hunter, and Udell (2004) project the future banking industry will be

divided between very large banks specializing in the use of hard information to make standardized

loans, and small banks specializing in the use of soft information and customer relationships to make

nonstandardized loans.

Although the above citations support small banks' proclivity toward relationship lending, there

is disparity in other research results. For instance, Strahan and Weston (1998) find that there is no

difference in credit availability to small firms from changes in banking system structure and its

underlying loan production processes; while Hancock, Peek, and Wilcox (2004) find that as banks

consolidate under the 50 largest holding companies, total small business lending is reduced. Others

show that reductions in small business lending from consolidation are offset by de novo banks[3]

(Goldberg and DeYoung, 1999; Goldberg and White, 1998), and by other types of financial institutions

(Berger, Miller, Rajan and Stein, 2002; Berger, Goldberg and White, 2001). Conversely some analysts

find that credit to small firms has improved with the advent of credit scoring models offered by large

banks, particularly with marginal credit (Berger, Frame, and Miller, 2004). Also, with these

technological improvements, large banks are finding a niche in making smaller loans amenable to

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[3] De novo banks are new entrants into the banking industry.

credit scoring (Levonian, 1997; Mester, 1997), while small banks are capturing more of the larger loans to small firms (Ely and Robinson, 2001). Furthermore, Frame, Padhi and Woosley (2004) find that credit scoring by large banks improved credit availability to small firms in low- and moderate-income areas. Finally, other research indicates nonbank financial institutions are making headway in the small business loan market (Cole and Wolken, 1996), and more particularly so with riskier credits (Craig and Hardee, 2006).

III. Data and Competing Hypotheses

A. Data

Given the divergence of prior findings, this research reexamines this issue using proprietary data not available to researchers outside the small business section within the Federal Reserve Board of Governors, thus illuminating the evidence in a much more direct fashion. The proprietary data, extracted from the 1998 Survey of Small Business Finances (Survey), allow the authorized researcher to identify at the firm level, the organizational structure of the bank used for financial products and the characteristics of the firm. That is, in this project the individual small firm data from the Survey are combined with banking data from the Federal Deposit Insurance Corporation's (FDIC) Summary of Deposits to get a bank/firm match.[4] Banking data are as of December 31, 1998, the date of the majority of the firms' fiscal year end.

The Survey is a nationally representative, weighted sample of small firms operating in the United States. as of year end 1998.[5] Of the 3,561 firms included in the Survey, 2,202 carry debt from a financial institution, of which 1,695 firms have bank debt. The financial institution debt emanates from

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[4] Only onsite analysts from the Small Business Section at the Board of Governors are authorized to match the firms in the Survey with data on the bank providers. Accordingly, Traci L. Mach completed the bank/firm match and provided data for Table I as well as all of the regression output reflected in Tables II through VI.

[5] The Survey data contain the sample weights constructed from the universe of small firms listed in Dun & Bradstreet's (D&B) Market Identifier file, a national register of small firms estimated to have about 93 percent of small businesses in the United States (Bitler, Robb & Wolken, 2001). The weights are designed to reflect from the sample the target population of all U.S. small businesses as listed by D&B.

depository institutions, mortgage companies, finance and leasing companies, brokerage houses, and insurance companies. It includes various loan products, exclusive of credit cards. Namely, there are six different credit instruments: lines of credit, mortgages, equipment loans, motor vehicle loans, capital leases, and other loans—loans not of the preceding types (primarily unsecured term loans).

Commercial banks, savings banks, and savings & loans constitute suppliers of bank debt and are what is termed "bank(s)" in this paper. Credit unions are excluded, since they are not FDIC-insured, thus are not part of the deposit data, and constitute minimal financial institution debt (Bitler, Robb, and Wolken, 2001). Of the 3,561 total firms included in the Survey, 70 did not have a bank-firm match—i.e., either they did not use a bank for financial services or the institution could not be identified. Thus our sample size is 3,491.

Table I reflects the weighted and unweighted mean and median firm debt from all financial institutions, as well as debt from banks by banking organization (holding company) size. The debt is the aggregate at the firm level of the above six credit instruments, and is one of the unique contributions to the body of literature. From Table I we see that average loan size increases as the assets of the banking organization increase. Although this is a function of regulatory lending limits that generally increase with bank size, it is interesting to note that the median firm debt for the largest organizations—over $10 billion in total assets—is lower than that of banks with assets of only $500 million to $1 billion—a manifestation which may be attributed to credit scoring in the large institutions.

Thus this project contributes to the research community by testing actual bank credit of small firms, analyzing it from the perspective of all sources, as well as the firm's primary bank. The latter is determined by the Survey, and represents the bank that the firm considers its most important source of financial services. While other studies have examined individual loan products in a bank-firm match,

to our knowledge no other published research has examined the aggregated total bank credit with a particular focus on the firm's primary institution.

B. Competing Hypotheses

The competing hypotheses follow the lines that large, more complex bank organizations primarily lend to small firms qualifying under the standardized (credit scoring) criteria, whereas small, more simply structured banks lend to firms falling under the umbrella of relationships. These hypotheses have theoretical underpinnings of hierarchical control expostulated by Williamson (1967).

On the one hand, Williamson posited that as an organization increases in size, it loses control between successive hierarchies. As mandated policies and procedures are transmitted to successive hierarchal levels, distortions increase. Consequently, a large, complex banking organization needs explicit guidelines of the standardized lending process to avoid deviation from mandates and resultant managerial diseconomies of scale. On the other hand, the smaller organization is less complex, or flat, allowing loan officers far more discretion in the approval process. Thus the organization ferrets out problems of adverse selection and moral hazard based on relationship lending. This research empirically measures the effects of these two lending techniques on credit availability through the model and methodology discussed below.

IV. Model and Empirical Methodology

A. General Model

The model utilizes a two-step Heckman process at the firm level to control for sample selection

estimation bias.[6] The first step estimates the probability of a small firm obtaining credit, while the

second step estimates normalized levels of credit for those firms with debt. A Heckman analysis is

employed because there are reasons to consider that the decision whether to carry debt may have

separate components than the decision concerning the level of debt. That is, the incentives to the

financial institution provider in supplying credit may not be consistent with the demand preferences for

debt by firms. For example, small businesses may respond to the banking environment by considering

whether they want to deal with a large, impersonal institution, or instead with a small community bank

organization. Furthermore, viable small firms may be rejected in the standardized loan application

process because of nonconsideration of soft information. But if approved, the cost savings of larger

institutions from economies of scale may be passed on through loan pricing, as found by Berger and

Udell (1996). Thus, conditional on the business surviving the loan approval process, the amount

borrowed may actually rise if credit is less expensive. This may affect the level of debt differently from

the probability of debt (Craig and Hardee, 2006). Thus the two steps in the loan approval process are

modeled separately. The first step models the probability that the firm has bank credit using a probit

specification. The general form is as follows:

Debt = f (bank market identification variables, firm characteristics) (1)

This first step (equation 1) captures the results of a reduced form outcome dependent on the

decision of a small firm to apply for debt, and the decision by a bank to approve that application. Here

all of the bank-matched firms in the Survey are tested, each weighted to mimic the U.S. small business

population. The second step in equation (2) expresses the level of credit conditional on debt.

Debt levels= f (bank structure variables, firm characteristics) (2)

Thus by explicitly modeling the decision process of how much bank debt the firm assumes as a

separate step from the decision to carry this debt, the differences in lending/borrowing behavior at both

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[6] The Heckman process by design is in two steps, and is a specific econometric estimation technique that is suited to this
model. When it is employed, the results are more reflective of the data.

stages of the funding process are captured. (This would be lost under a Tobit model, which assumes that the decision to carry debt is identical to the decision regarding the debt level.)

B. Dependent Variables

The dependent variables in our model are bank debt as measured by credit limits, inclusive of undrawn lines of credit, and outstanding bank loan balances (which exclude unused credit). This debt is normalized by the firm's total revenue. The total debt, determined by summing the individual credit instruments from all bank sources, as well as those from just the firm's primary bank, is part of the uniqueness of this study. Two dependent variables are used, total bank debt and primary bank debt, to isolate the behavior of determinants from bank sources other than the firm's primary bank. Literature supports this methodology in that Thakor (1996) demonstrated that the existence of multiple bank sources reduces the value of information acquisition by any one bank. Petersen and Rajan (1994) demonstrated that multiple lenders increase price and reduce credit availability to small firms. Cole, Goldberg, and White (2004) find that multiple lending sources decrease the likelihood of small firms' loan approvals. Thus, the effects of multiple bank sources are reflected in the total bank credit regression.

Further rationale for examining primary bank credit apart from total debt is based on the primary bank being the predominant repository of the firm's private and soft information. Unlike large publicly traded firms that have readily available information, a small firm has private information and much of it is soft, based on the character and reputation of the owner. The primary bank is privy to this, and consequently should have a comparative advantage in obtaining private information vis-à-vis other banks. Two studies supporting this argument are Scott (2004) and Shin, Fraser, and Kolari (2003). Thus the primary bank will be more inclined to employ relationship lending, whereas secondary sources of credit, short on soft information, may be employing standardized lending.

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C. Independent Variables

The independent variables relate to structure of the bank market for the first step in the model, where the firms having bank debt are identified through a probit or selection procedure. The individual bank structure is used in the second step of the model, which linearly tests levels of debt, conditional upon the firm having a bank loan.[7] The same firm characteristics are used in both steps.

Market and bank structure variables have been used to identify relationship lending or standardized lending in several studies, such as those cited previously regarding organizational size. Organizational complexity studies by Keeton (1995, 1996) find that banks with a high degree of branching and multi-bank holding companies (MBHC) hinder small business lending, a phenomenon Nakamura (1994) attributes to informational diseconomies of scale. Goldberg and DeYoung (1999) hypothesize that multi-bank holding company structure is particularly inimical to small business lending because it adds extra layers of bureaucracy. However, Stein (2002) argues that decentralized hierarchy eases informational flow, providing incentives for more efficient capital allocation. By deduction, MBHCs would more readily gather soft information, thereby fostering small business lending.

With respect to bank markets, Peterson and Rajan (1994) find that banks in more competitive markets make fewer loans to unestablished small firms because of informational deficiencies. In another paper, Peterson and Rajan (1995) suggest that small banks in more concentrated markets[8] invest in loan relationships because of greater assurance that the borrower will switch to a competitor. In contrast, Jarayante and Wolken (1999) find that small firms in areas with only a few small banks did not suffer lack of credit in the long run, although they did experience short-run disruptions. This paper builds on these concepts by utilizing market and bank structure measures in the model.

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[7] A probit or selection procedure in the first step of the Heckman process determines the probability of a firm having bank debt, assigning a value of one to firms with this debt, and zero otherwise. Thus only firms carrying bank debt (selected firms) are considered in the second step. This two-step estimation is the essence of the Heckman process.

[8] Concentrated markets are those with few, if any, competing banks.

Consequently, the *identification variables* employed in the first step (equation 1) focus on the bank market. These variables are based on the assumptions about firms' borrowing decisions. That is, firms would decide whether or not to borrow based on average characteristics of the local market of potential lenders, but once they had made the decision to borrow, the level would be determined by the characteristics of the actual financial institution the firm chose. Accordingly, the identification variables are the average banking characteristics of the local market—i.e., the MSA for urban firms and the county for rural firms, a definition commonly accepted in the literature (Amel and Brevoort, 2004). The identification variables used are **average banking organizations' assets**, **percent of banks in multi-bank holding companies (MBHC)**, **percent of unit (no-branch) banks,**[9] and **bank market concentration**, as measured by a Herfindahl index of bank deposits within the local market.

The *bank structure variables* used in the second step (for levels of credit conditional on having debt) capture the structure of multiple bank sources in the total bank credit regression. A separate regression does the same for the firm's primary bank. The source bank structure variables are continuous, except where noted by a flag, in which case they are dichotomous; for more than one bank source, an average is used. They are the following:

Miles to bank: Peterson and Rajan (2000) find that small firms are borrowing at greater distances due not only to bank consolidations, but also because of an increase in bank productivity. Thus, this variable tests for standardized lending via credit-scored, on-line borrowing.

Years with bank: Soft information gathered in relationship lending may increase over time, although Cole (1998) found the benefits of relationships to accrue within one year. Earlier papers using data from previous Surveys[10] show the longer the relationship, the greater the credit availability to small firms (Berger and Udell, 1995; Petersen and Rajan, 1994). However, Cole, Goldberg and White

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[9] Unit banks are stand-alone facilities having no branches—i.e., all the bank operations are "housed" in one location. They can be members of a multi-bank or one-bank holding company or just exist without a holding company structure. The distinguishing feature of a unit bank is that it has no branches.
[10] Surveys of small business finance conducted by the Federal Reserve Board of Governors cover data relating first to 1987, followed by 1993, then 1998 (the Survey used in this paper), and finally the most recent, 2003.

(2004), using the 1993 Survey, find no evidence of duration of the relationship improving the probability of a small firm's loan approval by a bank. Given the mixed evidence, this variable at a minimum acts as a control and may indicate telling evidence of relationship lending improving credit availability.

Log of banking organization assets: The natural log of the assets of the bank holding company or single bank (when no holding company structure exists) is used to distinguish the impact on firm credit between large organizations using standardized methods and small ones using relationships. Because of the wide range in asset size, the natural log is used to minimize problems of heteroscadasticity. The size of the organization, rather than the size of the bank, is employed to incorporate the effects of lending policy set at the holding company level.

Unit bank flag: This test for complexity of branch banks uses standardized lending.[11] That is, soft information may be more easily processed in a unit bank with its stand-alone location than through the various locations of branch banks. Thus when banks other than the primary bank furnish credit, standardized lending techniques may be employed, since that type of lending would be more amenable to branch rather than unit banks.

MBHC flag: This also is a test for organizational complexity, although the literature previously cited has shown mixed findings.

The *firm characteristics* include variables that allow for distinction between relationship and standardized bank lending. These include **size** (by number of workers); **age of firm**; **minority ownership**; and **type of industry**. Also used are financial variables of **profit** (normalized by firm assets) and **sales growth** of the firm,[12] credit history variables, such as the firm and principal owner's

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[11] The degree of branching is actually a better test of branching organizational complexity, since many small, simply structured banks have branches. However, because of multi-collinearity with size, and size being the preferred variable, we apply this cruder test. Again, a unit bank is one with no branch facilities. Multi-collinearity of variables implies the variables have such similar effects that they dampen their individual influence.

[12] The Survey data reflect only current and prior year sales. Consequently, this is a dummy variable (flag) equaling one, if the current year's sales are greater than those of the prior year, and zero otherwise. For firms not having or reporting prior

bankruptcies and the firm's **Dun & Bradstreet credit score**. These variables encompass hard information used in standardized lending, in contrast to the soft information collected over time through the firm/lender relationship—proprietary knowledge not easily transmitted to or verified by other lenders.

If the hypotheses hold, evidence of relationship lending will be predominant in small, more simply structured banking organizations, and the standardized (credit scoring) methods in large ones. Accordingly, firm characteristics will delineate lending methods through marginal or riskier firms with more soft information assumed by relationship lending and sounder firms with presumably hard, quantifiable information assumed by standardized lending methods. The distinction will be further clarified by comparing the results of multiple bank sources with that of the primary bank. Table II contains a complete list of all the variables, independent and dependent, including brief descriptions and means.

V.   **Results**

The banking variables, market- and firm-specific, along with firm characteristics, determine credit availability from all banks versus that from only the primary bank, and shed light on the testable hypotheses. The statistically significant signs on these variables reveal if relationship or standardized lending prevails. Implicit in the model is the assumption that firms drawing on lines of credit are more cash-constrained than firms carrying undrawn lines of credit. If that assumption is true, then the results on credit limits highlight firms that have more cash flow than the results on credit balances. Accordingly, one sees more differences in the outcome between primary and total bank credit in the balance results than in the limit results, particularly with the firm characteristics. Furthermore, the efficacy of the Heckman procedure is confirmed by the signs switching on some significant variables,

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year sales, we use a zero. Other variables in the firm characteristics represented by a discrete zero-one dummy variable (flag) are minority ownership, type of industry, and bankruptcy.

thus reflecting behavior in debt probability that is different from behavior reflected in debt levels.

A detailed discussion of the results is presented below under the two competing hypotheses. Unless otherwise noted, the statistical significance on the coefficients is the same in the marginal results. Since the interest is in the qualitative rather than quantitative outcome, the focus is on the coefficients rather than the marginal effects. Tables III.A and III.B reflect the coefficient results, while Tables IV.A through VII.B indicate the marginal effects.[13]

Basically one finds much more statistical significance in the likelihood of having credit than in the levels of credit. Evidence of standardized lending prevails when competing banks are involved in the provision of credit and evidence of relationship lending when only primary bank credit is considered. However, the evidence is inconclusive in determining if one method over the other improves credit availability to the small firm.

Comparison of effects of total bank credit to primary bank credit

Under the competing hypotheses, initially the bank variables' impact on the likelihood of a firm having bank credit are discussed, since this represents the selection aspect of our model. Next the impact of source bank structure on credit levels, conditional on a firm having bank debt, are analyzed. The focus is initially on the banking structure, since the impact of consolidation on small firm finance is the main area of concern among policymakers. The impact of firm characteristics on likelihood and levels of credit are covered together, since these variables are the same in both regressions.

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[13] In the Heckman procedure, coefficients are produced that indicate the direction (sign) of the variable and its significance. However, the likelihood (probit or SELECT) regression of the first step is nonlinear and its coefficients do not represent the quantitative effect of the independent variable's impact on the dependent variable as in a linear regression. The coefficient is exponentiated and used to produce the marginal effects, which are quantitative, showing the independent variables' impact (dy/dx) at the mean (x) reflected in the marginal tables. The marginal results in the LEVELS regression are predicted changes in amounts of credit (y), given the likelihood the firm has credit. The direction (sign) and the significance in the coefficients are generally the same as in the marginal results, particularly when the statistical significance is strong.

BANKING VARIABLES' IMPACT ON LIKELIHOOD OF CREDIT:

Except for the Herfindahl index, the outcome of these variables is the same for both primary and total bank credit. Bank market characteristics are initially analyzed, then source bank characteristics.

Bank Market Characteristics:

In the likelihood regression, bank size matters, and illuminates the competing hypotheses. That is, as the **average bank organization size** in the market increases, firms are less likely to have credit limits. This lends support to relationship lending in that the size of the bank organization may dampen the likelihood of small firms having credit because of informational diseconomies of scale.

As the percentage of **unit banks** increases in the bank market, the likelihood of a firm having credit is negative and significant. Since conceptually it is easier to process soft information in a unit bank where all operations are under one roof, this negative result is support for standardized lending. That standardized lending method would be easier to administer in a branch bank, with offices conceivably located across different markets. This outcome, coupled with the result of unit banks decreasing the levels of credit limits for total bank credit (as further discussed in the levels section) is evidence for competing branch banks employing standardized lending.

Additionally, standardized lending is supported in the likelihood regression by the result on **MBHCs**. Firms in bank markets with higher percentages of MBHCs show a greater probability of having credit. Analogous to branch banks, banking organizations with multiple banks in the holding company structure presumably would find standardized lending more efficient. However, as pointed out in the section below, when the bank is the primary bank, membership in an MBHC produces lower levels of credit, supporting relationship lending.

The outcome on the **Herfindahl** index is negative and significant in primary bank credit limits, indicating that these markets with increased competition are likely to have higher probabilities of

having debt. (The lower the index, the more competitive the market.) This supports the principle that competition improves product availability, particularly with primary credit. The lack of significance of this variable with total bank credit may indicate an Internet supply of funds from sources via standardized methods outside the banking market. That is, banks supplying funds online are not in the Herfindahl index unless they have a brick and mortar office in the local market. Or it just may indicate that the multiple bank sources apart from the primary bank are those that have a more concentrated share of market deposits, thereby abrogating the negative significance.

BANKING VARIABLES' IMPACT ON LEVELS OF CREDIT:

Source Bank Characteristics:

The variable, **years the firm has been with the bank,** is negative and significant in the primary bank regressions (limits and balances) but not with the average years in total banks. This indicates that with the primary lender, shorter durations improve credit relationships, and it indirectly confirms the findings of Cole (1998). This is supportive of relationship lending in that the primary bank can take the risk of increasing loan levels to firms more rapidly, given that, as the firm's primary banking institution, it has more private information on the firm. And the significance is even greater in the primary balance regressions, which presumably highlight relatively cash-constrained firms. But as evidenced in the total bank regressions, when competing bank organizations provide additional funds, the relationship is clouded; thus the variable loses significance. The number of years the firm has been with the competing sources does not affect the loan levels. This result supports the effect of relationships in the primary bank to more readily supply funds.

The **unit banks** variable is negative and significant in the total banks credit limits (not balances), but not in the primary banks regressions. In some respects, this lends support to relationship lending, in that the level of primary credit is not as affected by branch versus unit bank structure as is

the level of credit from competing bank providers. That is, when other banks are involved, unit banks provide lower debt levels relative to branch banks. Therefore, the evidence suggests that branch banks, when providing additional sources of credit, have higher debt levels. By inference, these banks likely use standardized lending. (This is further supported by the outcome of the percentage of unit banks in the market, discussed in the likelihood section above.) Furthermore, the variable for unit banks interacting with organizational size in the total bank credit limits is positive and significant, providing evidence of credit scoring in unit banks associated with large bank holding companies.

A primary bank in an **MBHC** is negative and significant in the balance regression. Additional layers of bureaucracy may make the primary institution more complex, thus lowering the loan balance. This is supportive of relationship lending in accordance with Williamson's organizational hierarchy (1967) and Goldberg and DeYoung (1999). As other bank sources provide credit, this organizational form does not matter, giving evidence of standardized lending used with the competing sources.

FIRM CHARACTERISTICS LIKELIHOOD AND LEVELS OF BANK CREDIT:

Firm Characteristics:

As with the banking variables, overall we find evidence of relationship lending in the primary bank credit and standardized practices in the other bank sources. This is more pronounced in the balance regressions, which again may reflect more cash-constrained firms.

For **firm age**, the youngest third of firms (from **zero to seven years**) are less likely to obtain credit as shown in the credit limits regressions for both total and primary banks, but in the bank balances regressions, only for total bank balances. The lack of statistical significance in the primary balances is weak support for the primary bank's ability to process soft information that reduces the risk associated with new firms.[14] That is, younger firms may be considered riskier, since they are less

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[14] The marginal effects indicate this variable is significant at the 10 percent level; this weakens the outcome of the coefficient.

established. The middle third (**firm ages 8 – 16 years**), have a higher probability of obtaining credit relative to the oldest firms with total banks, but not in the primary bank regressions. In summary, the primary bank does not make the firm age distinctions to the extent that the other sources do. This may be attributed to relationship lending overcoming the risks of less established entities.

Although **firm size** shows that the largest firms are more likely to obtain credit from both primary and competing sources, behavior differs in the levels; that is, the smallest third of firms as measured by **total employees (zero - three)** is positive and significant for the total banks in both the limits and balance regressions.[15] (However, it is negative and significant in the likelihood regressions, thus reinforcing the Heckman methodology capturing this different behavior.) Although these smallest and perhaps riskier firms have lower probabilities of obtaining credit, once credit is approved, the levels extended by the other source banks are greater. This outcome supports the literature that credit scoring is making inroads into the market for business loans of less than $100,000 (Mester, 1997; Ely and Robinson, 2001). That is, it is reasonable to surmise that these smallest of firms have smaller loans, a conclusion that implies that firm size gives evidence of credit scoring.

For **minority**-owned firms one finds in all regressions that these firms are less likely to carry bank credit, but there is evidence of relationship lending in the levels. Specifically, the level of balances is relatively higher at the primary bank. Here one may surmise that the relationship aspect allows for higher balances with this group of borrowers.

A strong indicator of relationship lending in the primary bank is the results on the **D & B credit score,** as well as **bankruptcy**. In the balance regression, the likelihood of a lower-rated firm obtaining credit is higher. That is, the higher the score, the better the credit. Thus in the primary relation, lower-ranked, riskier firms have more chance of obtaining a loan, but not when competing banks provide credit. These banks are likely to produce a low credit score on their own system, and thus reject these

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[15] The significance goes away in the marginal effects for levels of credit balances from all banks.

presumably cash-constrained firms in their standardized lending. In the **bankruptcy** variable one sees a similar outcome. No distinction is made between firms or their owners declaring bankruptcy by the primary bank, whereas when competing banks are considered, these firms are less likely to have a loan balance. (In terms of credit limits, which include undrawn lines of credit, bankruptcy decreases the chance of a firm obtaining credit at the primary and competing banks.) Taken together, the credit rating and bankruptcy results on credit probability reflect standardized lending in competing banks, with primary banks employing the alternative.

Basic principles of finance are evidenced in the results for **profit** as well as **sales growth,** but do not shed light on the competing hypotheses. Here we find, as expected, that more profitable firms and those with one-year sales growth are more likely to obtain credit, particularly in the limits. However, in the primary balances regressions, profit does not matter in the loan level, but is negatively significant in total banks balances. An interpretation of this is that less profitable firms carry higher balances in the standardized lending scheme. Regarding sales growth, the possibly cash-constrained firms with growing sales have lower balances in the primary banks, while the more cash-flush firms in the credit limits regression show lower levels in the total banks. However, no interpretation is made of this outcome.

Although within the industry types there is different behavior between the primary and total bank regressions, no interpretations are made under the competing hypotheses. However, it is interesting to observe that firms involved in the **real estate or transportation industry** have a higher likelihood of being selected for credit when competing banks were involved, but not with primary banks. This may be indicative of firms in the real estate industry, a "hot" market at the time of the data collection, obtaining additional credit from other bank sources.

VI.   **Conclusion and Policy Implications**

This research employs the fruitful data of the Survey of Small Business Finances, coupled with proprietary data identifying the firm's financial source, to ferret out standardized versus relationship lending in bank credit. Overall, one finds that bank structure does have an impact on bank credit extended to small firms, but the results are mixed. Although no conclusive evidence exists indicating that one lending technique dominates and improves credit availability, the evidence is strong that relationship lending appears inherent in primary banks and standardized lending in other bank providers.

In terms of the competing hypotheses, this research provides substantive evidence of the impact of two diverse lending techniques. The finding that one method is not apparently better has significant policy implications. It is possible that the changes in the banking industry and the resulting changes in small business finance are efficient in this market. That is, credit may be adequate because of the primary banks' niche in relationship lending, as large more complex banking organizations supplement supply via standardized methods. Furthermore, these large bank suppliers may serve as primary banks, and may augment standardized techniques with the benefits of proprietary relationship information. Thus, opaque but viable small firms may face sufficient credit availability in an environment of improved lending technologies and changing financial intermediary structure. Hence, the market, if allowed to function freely, efficiently allocates adequate financing to small firms regardless of the supplier's lending methodology.

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Table I.A. Firms' Outstanding Balances By Size Of Banking Organization

Firm Debt by Bank Organ. Size:	Unweighted Firm Debt		Weighted Firm Debt	
Variable	Mean	Median	Mean	Median
Firms' Credit balances with all Financial Institutions	845,884	69,150	229,537	35,000
Firms' CREDIT balances with all banking organizations	762,416	85,000	226,741	37,000
CREDIT BALANCE—Unclassified[1]	627,906	39,350	149,015	20,000
Asset Size of Banking Organization				
Under 25 Million	82,574	21,000	45,926	8,232
25 to 50 Million	196,148	60,000	148,878	60,000
50 to 100 Million	169,371	43,865	71,341	24,500
100 to 300 Million	238,419	81,500	126,182	48,000
300 to 500 Million	308,404	74,226	164,455	35,000
500 Million to 1Billion	259,224	62,447	147,409	45,000
Firm Debt to Bank Org. with Assets 1 Billion or less	*255,125*	*65,491*	*136,714*	*44,950*
Bank Assets 1B to 3B	496,418	91,000	234,597	50,000
Bank Assets 3B to 10B	502,066	77,335	215,434	30,000
Bank Assets Over 10B	937,963	61,789	247,382	28,985
Firm Debt to Bank Org. with Assets Greater than 1 Billion	*873,955*	*76,831*	*251,792*	*31,600*
Firms' CREDIT BALANCES with all primary institutions	790,246	83,670	234,618	33,028
Firms' CREDIT BALANCES with all primary banking organizations	808,183	90,784	236,227	38,000
CREDIT BALANCE--PRIMARY BANK, Unclassified[1]	1,007,779	108,469	217,764	32,080
Primary Bank Organ. Asset Size				
Under 25 Million	68,563	27,500	54,774	31,000
25 to 50 Million	209,371	107,076	200,225	127,000
50 to 100 Million	208,572	60,239	74,037	20,000
100 to 300 Million	276,208	98,500	145,241	55,000
300 to 500 Million	415,304	98,000	223,878	48,000
500 Million to 1Billion	327,125	60,423	149,902	38,000
Firm Debt to Primary Bank Organization Assets 1 Billion or less	*292,510*	*94,556*	*149,492*	*48,000*
Primary Bank Assets 1 to 3 Billion	551,154	111,500	242,423	61,972
Primary Bank Assets 3 to 10 Billion	570,316	90,500	228,668	33,560
Primary Bank Assets Over 10 Billion	1,154,196	88,000	297,090	30,000
Firm Debt to Primary Bank Organization Assets Greater than 1 Billion	*1,003,925*	*90,000*	*281,344*	*32,000*

[1] Unclassified implies that the size of the banking organization could not be determined, since it was unidentified in the bank-firm match.

Table I.B. Firms' Outstanding Credit Limits By Size Of Banking Organization

Firm Debt by Bank Organ. Size:	Unweighted Firm Debt		Weighted Firm Debt	
Variable	Mean	Median	Mean	Median
Firms' Credit limits with all Financial Institutions	1,167,270	98,139	322,244	48,718
Firms' CREDIT LIMITS with all banking organizations	1,089,430	103,535	329,696	50,000
CREDIT LIMIT—Unclassified[1]	891,756	50,000	287,338	30,000
Asset Size of Banking Organization				
Under 25 Million	81,210	25,000	53,326	15,000
25 to 50 Million	214,701	76,259	163,240	72,518
50 to 100 Million	203,197	45,000	98,583	25,000
100 to 300 Million	286,278	98,000	143,831	50,000
300 to 500 Million	368,899	85,500	180,580	25,000
500 Million to 1Billion	357,568	105,000	181,310	65,000
Total of Firm Debt to Bank Org. with Assets 1 Billion or less	_314,520_	_96,500_	_159,241_	_50,000_
Bank Assets 1B to 3B	615,193	111,000	267,924	50,000
Bank Assets 3B to 10B	680,384	100,000	322,391	50,000
Bank Assets Over 10B	1,375,941	91,000	367,542	46,000
Total of Firm Debt to Bank Org. with Assets Greater than 1 Billion	_1,266,132_	_100,000_	_364,587_	_50,000_
Firms' CREDIT LIMITS with all primary institutions	1,110,574	100,000	333,079	50,000
Firms' CREDIT LIMITS with all primary banking organizations	1,138,353	109,215	342,637	50,000
CREDIT LIMIT--PRIMARY BANK, Unclassified[1]	1,370,395	144,000	438,005	50,000
Primary Bank Organ. Asset Size				
Under 25 Million	67,709	25,000	60,261	31,000
25 to 50 Million	232,874	117,038	212,186	127,000
50 to 100 Million	237,346	60,000	97,477	25,000
100 to 300 Million	333,583	107,953	162,797	63,000
300 to 500 Million	488,717	121,500	240,843	48,000
500 Million to 1Billion	431,765	107,347	186,453	64,000
Firm Debt to Primary Bank Organization Assets 1 Billion or less	_352,918_	_100,000_	_169,998_	_53,460_
Primary Bank Assets 1 to 3 Billion	721,756	129,000	295,728	50,000
Primary Bank Assets 3 to 10 Billion	755,760	140,000	356,174	60,000
Primary Bank Assets Over 10 Billion	1,668,878	106,765	435,149	50,000
Firm Debt to Primary Bank Organization Assets Greater than 1 Billion	_1,439,246_	_114,034_	_407,797_	_50,000_

[1] Unclassified implies that the size of the banking organization could not be determined, since it was unidentified in the bank-firm match.

Table II. Variable Descriptions and Means

VARIABLE	Description	N	Mean	Std.
Dependent Variables				
Likelihood of Credit				
Credit Balances				
Total banks	A dichotomous variable equaling one if the firm has an outstanding bank loan balance with any bank (1462 firms), zero otherwise	3491	.3491	.0095
Primary banks	A dichotomous variable equaling one if the firm has an outstanding loan balance with the firm's primary bank (1163 firms), zero otherwise	3491	.3173	.0092
Credit Limits				
Total banks	A dichotomous variable equaling one if the firm has a credit limit with any bank (1695 firms), zero otherwise. This differs from bank balances in that it includes un-drawn lines of credit	3491	.4278	.0098
Primary banks	A dichotomous variable equaling one if the firm has a credit limit with the firm's primary bank (1402 firms), zero otherwise. It includes un-drawn lines of credit.	3491	.3273	.0093
Levels of Credit				
Balance to Revenue				
Total banks	Outstanding balance on all the firm's bank loans (mortgages, motor vehicles, equipment, lines of credit, other) at all source banks divided by total revenue of the firm	1448	.4768	.0599
Primary banks	Same as above except credit is only from the firm's primary bank--I.e., the bank the firm considers to be its most important provider of financial services	1330	.4566	.0560
Limits to Revenue				
Total banks	Total credit limit on all the firm's bank loans including un-drawn lines of credit (mortgages, motor vehicles, equipment, lines of credit, other) at all source banks divided by total revenue of the firm	1680	.5289	.0608
Primary banks	Same as above except credit is only from the firm's primary bank--I.e., the bank the firm considers to be its most important provider of financial services	1389	.4319	.0550

Table II. Variable Descriptions and Means (continued)

VARIABLE

Independent Variables	Description	N[1]	Mean[1]	Std.[1]
Firm Characteristics				
Firm age 0 - 7 years (fage1)	A dummy (0,1) variable for the youngest third of firms. The omitted variable is firms established for more than 16 years	1448 3491	.3076 .3701	.0156 .0097
Firm age 8 - 16 years (fage2)	A dummy (0,1) variable for the middle third of firms. The omitted variable is firms established for more than 16 years	1448 3491	.3726 .3362	.0164 .0095
1 - 3 employees (fsize1)	Measures firm size with a dummy (0,1) variable for the smallest third of firms in terms of number of workers, inclusive of sole proprietor. The omitted variable is firms larger than 10 employees	1448 3491	.3349 .5137	.0163 .0099
4 – 10 employees (fsize2)	Measures firm size with a dummy (0,1) variable for the middle third of firms. The omitted variable is firms larger than 10 employees	1448 3491	.4076 .3304	.0165 .0096
minority owned (c_minor)	A dummy variable if the primary owner--I.e., having the largest percent, is an ethnic minority.	1448 3491	.0698 .0947	.0055 .0030
D&B Credit Score (db_perct)	A continuous variable from zero to 100, with 100 representing the strongest credit rating determined by Dunn & Bradstreet.	1448 3491	51.68 51.05	.9716 .5553
bankruptcy in past 7 years (bankrupt)	A dummy variable if the primary owner or the firm declared bankruptcy within the last seven years.	1448 3491	.0158 .0244	.0045 .0030
Profit per asset (profitss)	The profit of the firm normalized by the firm's assets.	1448 3491	.0003 .0046	.0002 .0036
1998 sales>1997 sales (growing)	A dummy variable of 1 if the firm's current year's sales are greater than prior year.	1448 3491	.6577 .6080	.0159 .0098
	Standard Industrial Codes (SIC) as determined by the Census Bureau			
Construction	A dummy variable for the firm industry, Omitted variable is services	1448 3491	.1527 .1186	.0129 .0068
Manufacturing	A dummy variable for the firm industry, Omitted variable is Services	1448 3491	.0949 .0846	.0093 .0055
Trade	A dummy variable for the firm industry, wholesale or retail trade; the omitted variable is services	1448 3491	.2841 .2649	.0152 .0089
Real Estate & Transportation	A dummy variable for the firm industry, Omitted variable is Services	1448 3491	.1070 .1012	.0106 .0061

Note: Variable descriptions in parenthesis are the short names contained in the marginal effects, Tables IV - VII.

[1] Due to different number of observations for each dependent variable for conditional levels of debt, there are four subsets of means for the independent variables associated with each regression--total bank balances, primary bank balances, total bank limits, primary bank limits. Only total bank balances are reflected, since they are very similar to the remaining three. Full subsets will be furnished at the request of the author. The mean for the sample size N=3491 represents the mean for the variables in the selection (probit) regression.

Table II. Variable Descriptions and Means (continued)

VARIABLE

Independent Variables	Description	N^2	Mean^2	Std.^{2}
Source bank Variables	For multiple banks this represents an average			
Years with bank[1] (yearbank, yearprim)	The number of years the firm has had at least one financial service provided by the bank	1448	8.926	.2828
miles to nearest bank used[1] (distbank, distprim)	The number of miles from the firm's headquarters to the nearest and most frequently used bank office (branch).	1448	8.236	3.272
Log of Total Org Assets[1] (log_avas, log_prim)	The natural log of the assets of the banking organization--the consolidated holding company.	1448	15.454	.1670
at least one unit bank used[1] (unit, pr_unit)	A dummy variable if at least one of the bank credit providers is a unit bank	1448	.0672	.0085
at least one mbhc used[1] (hc_mbhc, pr_mbhc)	A dummy variable if at least one of the bank credit providers is a member of a multi-bank holding company	1448	.7144	.0156
BHC assets * unit bank (unit_size, pr_unsize)	The unit bank dummy variable interacted with the total assets of the bank holding company. This is to capture behavioral differences between unit banks that are members of small versus large bank organizations.	1448	.9556	.1206
Bank Market Variables				
herfindahl index-1998 100% bank (hhi_98)	An index based on local market deposits of all banking offices located in the county for a rural area and MSA for an urban area. It is computed by summing the square of each bank's market share. The variable is continuous with a high number implying the market is concentrated--i.e., containing very few banks.	3491	.2090	.0022
Log of Avg Org Asset in MSA/county (log_avas)	This is the natural log of the average assets of all the banking organizations in the local market.	3491	15.706	.02909
% mult bhc in msa/county (pctmbhc)	This is a percentage of multi-bank holding companies within the local bank market.	3491	.3483	.0032
% unit-banks in msa/county (pctunit)	This is a percentage of unit banks (single-office or no-branch banks) within the local bank market.	3491	.1444	.0025

[1] For multiple banks this is an average of all banks, otherwise it is the primary bank
Note: Variable descriptions in parenthesis are the short names contained in the marginal effects, Tables IV - VII.
[2] Due to different number of observations for each dependent variable for conditional levels of debt, there are four subsets of means for the independent variables associated with each regression--total bank balances, primary bank balances, total bank limits, primary bank limits. Only total bank balances are reflected, since they are very similar to the remaining three. Full subsets will be furnished at the request of the author. The mean for the sample size N=3491 represents the mean for the variables in the selection (probit) regression.

Table III.A. Total Banks and Primary Banks Regressions--Balances

VARIABLE DESCRIPTION	Balance to Revenue	Balance to Revenue	Primary Balance to Revenue	Primary Balance to Revenue
	LEVELS	SELECT	LEVELS	SELECT
Firm Characteristics	**Total**	**Total**	**Primary**	**Primary**
	Banks	Banks	Banks	Banks
Firm age 0 - 7 years	0.383	-0.129	0.292	-0.095
	(0.157)**	(0.058)**	(0.140)**	(0.059)
Firm age 8 - 16 years	0.024	0.091	0.027	0.083
	(0.109)	(0.054)*	(0.119)	(0.056)
1 - 3 employees	0.302	-0.888	0.126	-0.791
	(0.153)**	(0.049)***	(0.170)	(0.051)***
4 - 10 employees	0.041	-0.338	-0.064	-0.337
	(0.147)	(0.047)***	(0.172)	(0.050)***
minority owned	0.577	-0.201	0.785	-0.160
	(0.414)	(0.064)***	(0.472)*	(0.065)**
D&B Credit Score	-0.002	-0.001	0.000	-0.002
	(0.002)	(0.001)	(0.002)	(0.001)**
Bankruptcy in past 7 years	0.052	-0.323	0.033	-0.060
	(0.309)	(0.175)*	(0.220)	(0.153)
Profit per asset	-6.107	-3.628	-3.686	-3.916
	(3.436)*	(2.845)	(2.714)	(3.904)
1998 sales>1997 sales	-0.176	0.183	-0.252	0.100
	(0.138)	(0.045)***	(0.139)*	(0.046)**
Construction	-0.470	0.324	-0.414	0.288
	(0.147)***	(0.070)***	(0.136)***	(0.073)***
Manufacturing	-0.435	0.082	-0.320	0.158
	(0.159)***	(0.076)	(0.156)**	(0.076)**
Trade	-0.373	0.101	-0.191	0.091
	(0.177)**	(0.054)*	(0.163)	(0.055)*
Real Estate & Transportation	-0.043	0.169	0.141	0.091
	(0.200)	(0.076)**	(0.201)	(0.079)
Source Bank Characteristics				
Years with bank[1]	0.001		-0.010	
	(0.004)		(0.005)**	
miles to nearest bank used[1]	-0.000		-0.000	
	(0.000)		(0.000)	
Log of Total Org Assets[1]	0.016		-0.001	
	(0.017)		(0.011)	
at least one unit bank used[1]	-0.511		-0.117	
	(0.333)		(0.633)	
at least one mbhc used[1]	-0.270		-0.318	
	(0.251)		(0.193)*	
Unit bank * BHC assets[1]	-0.020		-0.011	
	(0.022)		(0.056)	

significant at 10%; ** significant at 5%; *** significant at 1%; standard errors in parentheses

[1] For multiple banks this is an average of all banks, otherwise it is the primary bank

Table III.A. Total Banks and Primary Banks Regressions--Balances (Continued)

VARIABLE DESCRIPTION		Balance to Revenue		Primary Balance to Revenue
		SELECT		SELECT
		Total		**Primary**
BANK MARKET CHARACTERISTICS		Banks		Banks
herfindahl index-1998 100% bank		-0.062		-0.249
		(0.195)		(0.209)
Log of Avg Org Asset in MSA/county		-0.081		-0.070
		(0.018)***		(0.018)***
% mult bhc in msa/county		0.530		0.571
		(0.144)***		(0.144)***
% unit-banks in msa/county		-0.565		-0.673
		(0.204)***		(0.216)***
Constant	0.657	1.202	0.932	1.039
	(0.252)***	(0.311)***	(0.355)***	(0.318)***
Observations	3491	3491	3491	3491

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table III.B.   Total Banks and Primary Banks Regressions--Limits

VARIABLE DESCRIPTION	Limit to Revenue	Limit to Revenue	Primary Limit to Revenue	Primary Limit to Revenue
	LEVELS	SELECT	LEVELS	SELECT
Firm Characteristics	**Total** Banks	**Total** Banks	**Primary** Banks	**Primary** Banks
Firm age 0 - 7 years	0.367	-0.173	0.294	-0.222
	(0.140)***	(0.055)***	(0.131)**	(0.059)***
Firm age 8 - 16 years	0.107	0.109	-0.015	0.089
	(0.124)	(0.051)**	(0.110)	(0.055)
1 - 3 employees	0.350	-1.035	0.139	-1.011
	(0.155)**	(0.045)***	(0.164)	(0.051)***
4 - 10 employees	0.022	-0.433	-0.073	-0.462
	(0.140)	(0.043)***	(0.172)	(0.048)***
minority owned	0.456	-0.205	0.623	-0.196
	(0.359)	(0.059)***	(0.436)	(0.066)***
D&B Credit Score	-0.002	0.001	-0.000	0.001
	(0.002)	(0.001)	(0.002)	(0.001)
bankruptcy in past 7 years	0.007	-0.457	0.012	-0.520
	(0.309)	(0.178)**	(0.204)	(0.200)***
Profit per asset	-0.130	0.399	-0.126	0.475
	(0.031)***	(0.139)***	(0.030)***	(0.132)***
1998 sales>1997 sales	-0.268	0.204	-0.236	0.142
	(0.152)*	(0.043)***	(0.144)	(0.046)***
Construction	-0.488	0.379	-0.329	0.365
	(0.147)***	(0.065)***	(0.146)**	(0.071)***
Manufacturing	-0.447	0.053	-0.255	0.136
	(0.162)***	(0.073)	(0.167)	(0.078)*
Trade	-0.419	0.133	-0.150	0.168
	(0.176)**	(0.052)**	(0.158)	(0.056)***
Real Estate & Transportation	-0.069	0.230	0.140	0.108
	(0.194)	(0.071)***	(0.193)	(0.079)
Source Bank Characteristics				
Years with bank[1]	0.005		-0.008	
	(0.004)		(0.004)*	
miles to nearest bank used[1]	-0.000		-0.000	
	(0.000)		(0.000)	
Log of Total Org Assets[1]	0.011		0.006	
	(0.014)		(0.016)	
At least one unit bank used[1]	-0.713		-0.190	
	(0.288)**		(0.591)	
At least one mbhc used[1]	-0.198		-0.379	
	(0.211)		(0.236)	
Unit bank * BHC assets[1]	0.036		-0.006	
	(0.019)*		(0.053)	

significant at 10%; ** significant at 5%; *** significant at 1%; standard errors in parentheses

[1] For multiple banks this is an average of all banks, otherwise it is the primary bank

Table III.B. Total Banks and Primary Banks Regressions--Limits (Continued)

VARIABLE DESCRIPTION		Limits to Revenue		Primary Limits to Revenue
		SELECT **Total**		SELECT **Primary**
BANK MARKET CHARACTERISTICS		Banks		Banks
herfindahl index-1998 100% bank		-0.239		-0.407
		(0.184)		(0.203)**
Log of Avg Org Asset in MSA/county		-0.077		-0.073
		(0.017)***		(0.018)***
% mult bhc in msa/county		0.494		0.470
		(0.139)***		(0.147)***
% unit-banks in msa/county		-0.615		-0.586
		(0.193)***		(0.214)***
Constant	0.751	1.337	0.879	1.161
	(0.253)***	(0.294)***	(0.414)**	(0.315)***
Observations	3491	3491	3491	3491

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

[1] For multiple banks this is an average of all banks, otherwise it is the primary bank

Table IV.A MARGINAL EFFECTS OF PROBABILITY—BALANCES—ALL BANKS

----------------y = Pr(select) (predict, psel) = .32836004--------------------

Variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		(mean)X
fage1*	-.0463229	.0205	-2.26	0.024	-.08651	-.006136	.370137
fage2*	.033255	.01988	1.67	0.094	-.005705	.072215	.336248
fsize1*	-.314248	.01564	-20.10	0.000	-.344896	-.2836	.513697
fsize2*	-.1185937	.01573	-7.54	0.000	-.149422	-.087766	.330358
c_minor*	-.0698998	.0213	-3.28	0.001	-.111637	-.028162	.094663
db_perct	-.0002902	.00029	-0.99	0.321	-.000863	.000282	51.0567
bankrupt*	-.1074884	.05252	-2.05	0.041	-.210425	-.004552	.024449
construt*	.1223346	.02738	4.47	0.000	.068663	.176006	.118577
manufac*	.0300431	.02809	1.07	0.285	-.025014	.0851	.084611
trade*	.036806	.02002	1.84	0.066	-.002428	.07604	.264925
realtran*	.0626226	.02887	2.17	0.030	.006032	.119213	.101172
profitAs	-1.311135	1.02066	-1.28	0.199	-3.31159	.689315	.004629
growing*	.0655285	.01595	4.11	0.000	.034271	.096786	.608011
yearbank	0	0	.	.	0	0	7.47244
disbank	0	0	.	.	0	0	9.34801
log_bhct	0	0	.	.	0	0	14.1718
unit*	0	0	.	.	0	0	.050686
unit_size	0	0	.	.	0	0	.682326
hctmult*	0	0	.	.	0	0	.611365
hhi_98	-.0224605	.07061	-0.32	0.750	-.160853	.115932	.209041
log_avAst	-.0291631	.00643	-4.54	0.000	-.041757	-.01657	15.7057
pctMbhc	.1914631	.05166	3.71	0.000	.090211	.292715	.348279
pctunit	-.2042533	.07386	-2.77	0.006	-.349021	-.059485	.144387

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table IV.B (Con't) MARGINAL EFFECTS OF LEVELS—BALANCES—ALL BANKS

----------------y = E(bkbal_rev|Zg>0) (predict, ycond)= .57317178-------------

Variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
fage1*	.374447	.15576	2.40	0.016	.069159	.679735	.370137
fage2*	.0305996	.11048	0.28	0.782	-.185928	.247127	.336248
fsize1*	.2424923	.17328	1.40	0.162	-.097123	.582108	.513697
fsize2*	.0175449	.15058	0.12	0.907	-.277577	.312667	.330358
c_minor*	.5635602	.40973	1.38	0.169	-.2395	1.36662	.094663
db_perct	-.0015822	.00198	-0.80	0.425	-.005466	.002301	51.0567
bankrupt*	.0292548	.31045	0.09	0.925	-.579224	.637733	.024449
construt*	-.4487538	.14038	-3.20	0.001	-.723902	-.173605	.118577
manufac*	-.4292714	.15659	-2.74	0.006	-.736187	-.122356	.084611
trade*	-.3665328	.17549	-2.09	0.037	-.710486	-.022579	.264925
realtran*	-.0318037	.19796	-0.16	0.872	-.419797	.356189	.101172
profitas	-6.351188	3.52605	-1.80	0.072	-13.2621	.559734	.004629
growing*	-.1632325	.13534	-1.21	0.228	-.428486	.10202	.608011
yearbank	.0013711	.00358	0.38	0.702	-.005641	.008383	7.47244
disbank	-.000305	.00028	-1.10	0.270	-.000847	.000237	9.34801
log_bhca	.0158009	.01682	0.94	0.348	-.017168	.04877	14.1718
unit*	-.5110525	.33299	-1.53	0.125	-1.16369	.141588	.050686
unit_size	.0195502	.02209	0.89	0.376	-.023745	.062845	.682326
hctmult*	-.2703293	.25074	-1.08	0.281	-.761769	.221111	.611365
hhi_98	-.0041883	.01342	-0.31	0.755	-.030488	.022112	.209041
log_avas	-.0054381	.00362	-1.50	0.133	-.012538	.001662	15.7057
pctmbhc	.0357027	.02281	1.56	0.118	-.009014	.080419	.348279
pctunit	-.0380877	.02815	-1.35	0.176	-.093258	.017083	.144387

Table V.A MARGINAL EFFECTS OF PROBABILITY—BALANCES— PRIMARY BANK

```
----------------- y = Pr(select) (predict, psel) = .2974236-----------------
```

Variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
fage1*	-.0326364	.01998	-1.63	0.102	-.071801	.006528	.370137
fage2*	.0288303	.01956	1.47	0.140	-.009506	.067167	.336248
fsize1*	-.2704298	.0162	-16.69	0.000	-.302191	-.238669	.513697
fsize2*	-.1125586	.01593	-7.07	0.000	-.143782	-.081335	.330358
c_minor*	-.0532588	.02074	-2.57	0.010	-.093904	-.012614	.094663
db_perct	-.0006505	.00028	-2.30	0.022	-.001206	-.000096	51.0567
bankrupt*	-.0203641	.05139	-0.40	0.692	-.121088	.08036	.024449
constr~t*	.1046858	.02787	3.76	0.000	.050062	.15931	.118577
manufac*	.0563361	.02804	2.01	0.044	.001387	.111285	.084611
trade*	.0318663	.01948	1.64	0.102	-.006318	.070051	.264925
realtran*	.032119	.0285	1.13	0.260	-.023731	.087969	.101172
profitas	-1.356241	1.33979	-1.01	0.311	-3.98218	1.2697	.004629
growing*	.0345518	.01571	2.20	0.028	.003764	.065339	.608011
yearprim	0	0	.	.	0	0	6.35272
distprim	0	0	.	.	0	0	8.91787
log_prim	0	0	.	.	0	0	12.7929
pr_unit*	0	0	.	.	0	0	.031939
pr_unsize	0	0	.	.	0	0	.359714
pr_mbhc *	0	0	.	.	0	0	.557456
hhi_98	-.0863962	.07242	-1.19	0.233	-.228335	.055543	.209041
log_avas	-.0243941	.00624	-3.91	0.000	-.036626	-.012162	15.7057
pctmbhc	.1976972	.04946	4.00	0.000	.100759	.294636	.348279
pctunit	-.2330948	.0748	-3.12	0.002	-.379701	-.086489	.144387

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table V.B (Con't)MARGINAL EFFECTS OF LEVELS—BALANCE— PRIMARY BANK

```
--------------- y = E(bkbal_rev|Zg>0) (predict, ycond)= .52499672------------
```

Variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
fage1*	.2853985	.13779	2.07	0.038	.015335	.555462	.370137
fage2*	.0326174	.1198	0.27	0.785	-.202179	.267413	.336248
fsize1*	.0680143	.19092	0.36	0.722	-.306189	.442217	.513697
fsize2*	-.0886643	.1764	-0.50	0.615	-.434397	.257068	.330358
c_minor*	.7731674	.46717	1.65	0.098	-.142475	1.68881	.094663
db_perct	.0002338	.00173	0.14	0.892	-.003155	.003622	51.0567
bankrupt*	.0281779	.21818	0.13	0.897	-.399454	.45581	.024449
construt*	-.3935217	.1251	-3.15	0.002	-.638718	-.148326	.118577
manufac*	-.3087387	.15044	-2.05	0.040	-.603594	-.013883	.084611
trade*	-.1841233	.1601	-1.15	0.250	-.49792	.129673	.264925
realtran*	.1477787	.19858	0.74	0.457	-.241432	.53699	.101172
profitas	-3.975625	2.9424	-1.35	0.177	-9.74261	1.79136	.004629
growing*	-.2449817	.13763	-1.78	0.075	-.514741	.024778	.608011
yearprim	-.0104404	.00482	-2.17	0.030	-.019884	-.000997	6.35272
distprim	-.0001758	.00018	-0.98	0.327	-.000528	.000176	8.91787
log_prim	-.0007258	.01067	-0.07	0.946	-.021644	.020192	12.7929
pr_unit*	-.1165715	.6326	-0.18	0.854	-1.35645	1.12331	.031939
pr_unsize	-.0108121	.0555	-0.19	0.846	-.119593	.097969	.359714
pr_mbhc *	-.3176677	.19301	-1.65	0.100	-.695961	.060625	.557456
hhi_98	-.0184244	.01904	-0.97	0.333	-.055746	.018897	.209041
log_avas	-.0052022	.00366	-1.42	0.155	-.012369	.001965	15.7057
pctmbhc	.0421598	.02917	1.45	0.148	-.015008	.099327	.348279
pctunit	-.0497085	.03562	-1.40	0.163	-.119525	.020108	.144387

Table VI.A. MARGINAL EFFECTS OF PROBABILITY—LIMITS—ALL BANKS

```
---------------------- y = Pr(select) (predict, psel) = .39461464-----------
```

Variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
fage1*	-.0661959	.02073	-3.19	0.001	-.106827	-.025564	.370137
fage2*	.0422781	.01994	2.12	0.034	.003195	.081361	.336248
fsize1*	-.3838054	.01479	-25.96	0.000	-.412784	-.354827	.513697
fsize2*	-.1619278	.01533	-10.56	0.000	-.191969	-.131887	.330358
c_minor*	-.0766465	.0216	-3.55	0.000	-.118977	-.034316	.094663
db_perct	.0004733	.0003	1.59	0.111	-.000109	.001056	51.0567
bankrupt*	-.1611153	.05511	-2.92	0.003	-.26912	-.05311	.024449
construt*	.1490452	.02585	5.77	0.000	.098382	.199709	.118577
manufac*	.0205182	.02839	0.72	0.470	-.035118	.076154	.084611
trade*	.0517071	.02029	2.55	0.011	.011936	.091478	.264925
realtran*	.0902074	.02828	3.19	0.001	.034775	.145639	.101172
profi~ss	.1537015	.05334	2.88	0.004	.049164	.258239	.004629
growing*	.0779235	.01621	4.81	0.000	.046144	.109703	.608011
yearbank	0	0	.	.	0	0	7.47244
disbank	0	0	.	.	0	0	9.34801
log_mbhc	0	0	.	.	0	0	14.1718
unit*	0	0	.	.	0	0	.050686
unit_size	0	0	.	.	0	0	.682326
hctmult*	0	0	.	.	0	0	.611365
hhi_98	-.0918856	.07091	-1.30	0.195	-.230869	.047098	.209041
log_avas	-.0294534	.00651	-4.53	0.000	-.042206	-.016701	15.7057
pctmbhc	.1902466	.05328	3.57	0.000	.085823	.29467	.348279
pctunit	-.2367527	.07411	-3.19	0.001	-.382012	-.091493	.144387

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table VI.B.(Con't) MARGINAL EFFECTS OF LEVELS—LIMITS—ALL BANKS

```
---------------- y = E(bkbal_rev|Zg>0) (predict, ycond)= .66227194-----------
```

Variable	dy/dx	Std. Err.	z	P>|z|	[95% C.I.]		X
fage1*	.360503	.13971	2.58	0.010	.086679	.634327	.370137
fage2*	.1113107	.12497	0.89	0.373	-.133625	.356246	.336248
fsize1*	.3100284	.18335	1.69	0.091	-.049323	.66938	.513697
fsize2*	.0050293	.147	0.03	0.973	-.283085	.293144	.330358
c_minor*	.447495	.35566	1.26	0.208	-.249594	1.14458	.094663
db_perct	-.0023835	.00199	-1.20	0.230	-.006277	.00151	51.0567
bankrupt*	-.0119841	.30901	-0.04	0.969	-.61764	.593672	.024449
constr~t*	-.4740419	.14251	-3.33	0.001	-.753347	-.194737	.118577
manufac*	-.4451933	.1605	-2.77	0.006	-.759763	-.130624	.084611
trade*	-.4138963	.17408	-2.38	0.017	-.755081	-.072711	.264925
realtran*	-.0598627	.19216	-0.31	0.755	-.43649	.316765	.101172
profi~ss	-.1146666	.03833	-2.99	0.003	-.1898	-.039533	.004629
growing*	-.2596617	.14965	-1.74	0.083	-.552975	.033652	.608011
yearbank	.005365	.00408	1.31	0.189	-.00264	.01337	7.47244
disbank	-.0002645	.00017	-1.60	0.109	-.000588	.000059	9.34801
log_bh~t	.0112709	.01409	0.80	0.424	-.016344	.038886	14.1718
unit*	-.7127428	.28763	-2.48	0.013	-1.27649	-.148996	.050686
unit_s~e	.0361842	.01937	1.87	0.062	-.001789	.074157	.682326
hctmult*	-.197507	.21089	-0.94	0.349	-.610844	.21583	.611365
hhi_98	-.0092219	.01174	-0.79	0.432	-.032226	.013782	.209041
log_avAs	-.002956	.00321	-0.92	0.357	-.009245	.003333	15.7057
pctmult	.0190938	.01964	0.97	0.331	-.019398	.057586	.348279
pctunit	-.0237613	.02601	-0.91	0.361	-.074743	.02722	.144387

Table VII.A. <u>MARGINAL EFFECTS OF PROBABILITY—LIMITS— PRIMARY BANK</u>
```
------------------- y = Pr(select) (predict, psel) = .3062348----------------
Variable |     dy/dx    Std. Err.      z     P>|z|   [    95% C.I.    ]        X
---------+--------------------------------------------------------------------
   fage1*| -.0766632     .02004     -3.83    0.000   -.115946  -.037381   .370137
   fage2*|  .0314226     .01967      1.60    0.110    -.00713   .069975   .336248
   fsize1*| -.345913     .01509    -22.92    0.000   -.375497  -.316329   .513697
   fsize2*| -.1543896     .01485    -10.40    0.000   -.183487  -.125292   .330358
  c_minor*| -.0659412      .021     -3.14    0.002   -.107098  -.024784   .094663
  db_perct |  .000261      .00029     0.90    0.366   -.000304   .000827   51.0567
  bankrupt*| -.1553336     .04802    -3.23    0.001   -.249448   -.06122   .024449
  constr~t*|  .1353005     .02734     4.95    0.000    .081723   .188878   .118577
   manufac*|  .0489625     .02858     1.71    0.087   -.007052   .104977   .084611
    trade*|  .0601164      .0205      2.93    0.003    .019941   .100292   .264925
  realtran*|   .038681     .02898     1.33    0.182    -.01812   .095482   .101172
  profitas |  .1668286     .04609     3.62    0.000    .076496   .257161   .004629
   growing*|    .04924     .01599     3.08    0.002    .017908   .080572   .608011
  yearprim |        0          0       .        .           0         0   6.35272
  distprim |        0          0       .        .           0         0   8.91787
  log_prim |        0          0       .        .           0         0   12.7929
   pr_unit*|        0          0       .        .           0         0   .031939
  pr_unsize|        0          0       .        .           0         0   .359714
  pr_mbhc *|        0          0       .        .           0         0   .557456
    hhi_98 | -.1428038     .07119    -2.01    0.045   -.282336  -.003272   .209041
  log_avas | -.0255357     .00632    -4.04    0.000   -.037929  -.013142   15.7057
   pctmbhc |  .1647777      .0512     3.22    0.001    .064431   .265124   .348279
    pctunit | -.2056721     .07501    -2.74    0.006   -.352683  -.058661   .144387
------------------------------------------------------------------------------
```
(*) dy/dx is for discrete change of dummy variable from 0 to 1

Table VII.B.(Con't).MARGINAL EFFECTS OF LEVELS—LIMITS— PRIMARY BANK
```
---------------- y = E(bkbal_rev|Zg>0) (predict, ycond)= .54764608-----------
Variable |     dy/dx    Std. Err.      z     P>|z|   [    95% C.I.    ]        X
---------+--------------------------------------------------------------------
firmage1*|  .2802812      .12801     2.19    0.029    .029392   .531171   .370137
firmage2*|  -.009465      .11226    -0.08    0.933   -.229495   .210565   .336248
firmsze1*|  .0778761      .20011     0.39    0.697   -.314337    .47009   .513697
irmsize2*| -.1017316      .18673    -0.54    0.586   -.467712   .264249   .330358
minorowne|  .6105118      .43202     1.41    0.158   -.236235   1.45726   .094663
db_perct | -.0001953      .00158    -0.12    0.901   -.003284   .002893   51.0567
bankrupt*| -.0208456      .20422    -0.10    0.919   -.421113   .379422   .024449
construt*| -.3080355      .13184    -2.34    0.019   -.566437  -.049634   .118577
manufact*| -.2467695      .16169    -1.53    0.127   -.563679    .07014   .084611
    trade*| -.1395288      .15195    -0.92    0.358   -.437346   .158289   .264925
realtran*|  .1462399      .18981     0.77    0.441   -.225773   .518253   .101172
profitAs | -.0968735      .04492    -2.16    0.031   -.184906   -.00884   .004629
 growing*| -.2273922      .14038    -1.62    0.105   -.502531   .047747   .608011
yearprim | -.0084956      .00434    -1.96    0.050   -.017001   9.5e-06   6.35272
distprim |  -.000164       .00019    -0.85    0.395   -.000542   .000214   8.91787
log_prbk |  .0055459      .01646     0.34    0.736   -.026715   .037806   12.7929
 pr_unit*| -.1895257      .59065    -0.32    0.748   -1.34717   .968119   .031939
pr_unsize| -.0062391      .05303    -0.12    0.906   -.110175   .097697   .359714
pr_hctpt*| -.3789804      .23597    -1.61    0.108    -.84148   .083519   .557456
   hhi_98 | -.0246625      .02246    -1.10    0.272   -.068692   .019367   .209041
log_avAs | -.0044101      .00369    -1.20    0.232   -.011642   .002822   15.7057
 pctmbhc |  .0284574       .0237     1.20    0.230   -.018003   .074917   .348279
   pctunit |  -.03552       .0305    -1.16    0.244    -.0953    .02426   .144387
------------------------------------------------------------------------------
```