# MITIGATING INFORMATION ASYMMETRIES THROUGH THE USE OF LOAN MATURITIES

Rebecca González, University of North Carolina-Pembroke, PO Box 1510, Pembroke, NC 28372

Teofilo Ozuna, University of Texas-Pan American, 1201 W University Dr, Edinburg, TX 78539

Jose A. Pagán, University of North Texas, 3500 Camp Bowie Blvd, Fort Worth, TX 76107

## ABSTRACT

Given that small businesses are important drivers of the U.S. economy, particularly as employment vehicles for racial/ethnic minorities and women, we explore non-price loan terms, specifically, the loan maturity imposed on borrowers by lenders. This study is important because most of the research on group differences in lending focuses on loan denial rates or the pricing of credit as measured by loan interest rates. The results of this study show that differences in loan maturity terms do exist between ethnic and gender groups. The lower risk groups (White and male owned businesses) encounter shorter loan terms. The differences that do exist in loan maturity terms are partially explained by the length of the relationship between the lenders and the borrowers and by the interest rate associated with the loan.

## INTRODUCTION

Small businesses are important drivers of the U.S. economy, creating millions of jobs and producing a relatively large share of the gross national product (Gebremariam, Gebremedhin, Jackson, 2004), yet they tend to struggle most in economic downturns and credit crunches (Croushore, 2007). They rely heavily on bank loans as they lack the track record, experience and financial stability necessary to raise capital via public debt or equity securities (Berger and Udell, 1998). In fact, the Small Business Administration cites that 65% of small businesses are primarily funded by banks and similar financial institutions. While the incidence of small business financing via banks and financial institutions is high, it is also important to note that these small business loans are deemed high risk to the lenders involved. Small businesses by nature are informationally opaque and many of them lack the capacity to provide detailed financial statements (Berger and Frame, 2007). As such, informational asymmetries between small business borrowers and lenders can result in moral hazard and adverse selection (Croushore, 2007).

A corollary issue is that small businesses are a valuable vehicle for employment options to racial/ethnic minorities and women. Studies have increasingly noted that entrepreneurship amongst Hispanics, Blacks, and females has continuously grown since the 1970s (Fairlie, 2004; Hughes, 2003). A recent report by the U.S. Small Business Administration's Office of Advocacy (2008) notes that immigrants (who are primarily of Hispanic origin) are 30% more likely to go into business for themselves when compared to non-immigrants. In a 2007 address to the U.S. Senate Committee on Small Business and Entrepreneurship, Senator John Kerry stated that minority owned businesses made up more than half of the two million new businesses started in the United States. He acknowledged that U.S. Census forecasts

predict that by 2050, there will be 131 million new United States citizens, and the vast majority of these new citizens will belong to racial/ethnic minority groups.

Women in business should also not be ignored. Lowrey (2006) finds that female owned businesses made up about 30% of non-farm businesses and contributed almost one trillion dollars in revenue. Caputo (1998) also asserts that there are a growing number of women entering self-employment. Various push or pull studies have been put forth to explain this phenomenon, but generally, studies show that women turn to self- employment as they seek out their personal financial independence or attempt to create more flexible work schedules to accommodate family obligations (Delage, 2002; Green and Cohen, 1995). There is a clear need for new research on the financing options and terms available to women and minorities due to the vital role that small businesses play in the U.S. economy and the fact that women and minorities are actively involved in entrepreneurship.

Translating the analysis of information asymmetries to the lending arena, it is known that principal-agent issues exist. Borrowers (in this case, agents) attempt to convey their minimal credit risk by providing as much information as possible or by negotiating loan terms (opting for shorter financing periods, providing more collateral, etc). The principal (the lender) then takes the information and signals provided by the borrower and uses these to adjust contractual details (Spence, 1973). Exactly how much of a say borrowers have in negotiating their non-price loan terms, however, is inconclusive. First, there is no consensus on whether riskier borrowers prefer short or long term loans. Jun and Jen (2003) find that financially weak and financially strong firms will opt for loan maturities that either minimize their refinancing risk exposure or lower their interest obligations. They conclude that riskier borrowers tend to prefer long term loans despite the higher interest rates that accompany them, because they encounter greater exposure to the refinancing risks associated with short term loans. Diamond (1991), on the other hand, posits that while borrower risk plays a role in the type of loan maturity that is sought, weaker firms gravitate more towards short term loans. A lender is usually capable of discerning whether a borrowing firm is financially stable. If the lender suspects the borrower is indeed high risk, they will be inclined to increase the already high interest rate that is often associated with a long term loan. Substantially higher interest rates, then, would drive riskier borrowers toward short term loans.

Secondly, while the preferred loan maturity is still debatable, there is also evidence to suggest that the role a borrower has in determining their optimal loan structure is limited. Bodenhorn (2003), Boot and Thakor (1994) and Diamond (1991) find that the length of the relationship between the lender and the borrower helps determine contract renegotiation possibilities. Stronger borrowers with lengthier relationships are better able to signal their creditworthiness which in turn can help them minimize their debt expenses. Janjigian (1994), on the other hand finds that lenders often impose their will in order to minimize their own risk exposures to phenomenon such as interest rate risk. Lenders often deem longer term loans as riskier because they expose them to greater default, interest rate, and inflationary risk (Croushore, 2007).

Finally, there is a stream of research that shows that lenders can attempt to use loan maturity as a means to monitor riskier borrowers. More recently, research has shown that by shortening loan maturities, lenders can more closely monitor high risk borrowers (Diamond and Rajan, 2001; Berger et al, 2005; Ortiz-Molina and Peñas, 2006). Dealing with an imbalance of information is to be expected, however, lenders should exercise precaution in not imposing some of these practices unfairly amongst groups as they would be giving up key profit-making opportunities. Various studies have found that credit denial to underrepresented groups is far greater than denial to non-underrepresented groups. When minorities or females do obtain financing, they often encounter less favorable loan terms, particularly in the realm of interest rates (Blanchflower, Levine and Zimmerman, 2003; Cavalluzzo, Cavalluzzo and Wolken, 2002; Cavalluzzo and Cavalluzzo, 1998; Cavalluzzo and Wolken, 2005; and Schauer and Soden, 2001). It is

important to determine if monitoring through loan maturities is applied equally amongst borrowers and whether a borrower's gender or ethnicity might be factored into their risk assessment.

It is apparent how vital small businesses are in spurring economic growth and how they provide employment opportunities for minorities and females. As such, small business financing requires further research, in particular with regard to non-price loan terms and how lenders mitigate information asymmetries borne from the opacity of small business financials. This study focuses on the non-price loan factor of maturity and its application in small business loans. Whether loan maturity is self-selected or imposed by lenders, the purpose of this study is to investigate whether loan maturity differs between gender and ethnic groups. Any difference is then assessed to determine how firm, market, and loan characteristics might impact or influence the difference in loan maturity between groups. The study is important because most of the research on group differences in lending focuses on loan denial or approval rates or the pricing of credit as measured by loan interest rates. By exploring non-price loan terms, specifically, the loan maturity imposed on borrowers by lenders, the study contributes to research in small business financing and group borrower differences in lending.

The results of this study show that differences in loan maturity terms do exist between ethnic and gender groups. The lower risk groups (White and male owned businesses) encounter shorter loan terms, as predicted by Jun and Jen (2003). The differences that do exist in loan maturity terms are partially explained by the length of the relationship between the lenders and the borrowers and by the interest rate associated with the loan. Geographic proximity, firm age, credit score, competition, and loan amount do little to explain the difference in loan maturity terms across all gender and ethnic/racial groups.

## LITERATURE REVIEW

Akerlof (1970), Spence (1973) and Stiglitz (1975) note how adverse selection and moral hazard may be dealt with by the party that has additional information and the party that lacks the additional information. Their findings are indicative of the problems inherent within the lending industry where borrowers seeking out loans are at an informational advantage relative to the lenders making the loans. Akerlof (1970) detailed various methods for mitigating information asymmetries (and the problems of adverse selection and moral hazard that information asymmetry causes), including the use and implementation of guarantees such as loan covenants and collateral requirements. He also noted the opportunities to diminish information discrepancies that come about from experience, much like relationship lending between lenders and borrowers.

Spence (1973) presents the concept of using applicant signals in assessing relative risk levels. Such signals include lenders relying on credit scores, work experience and tenure, and certain "immutable characteristics" such as race and gender when assessing applicant riskiness. Stiglitz (1975) goes one step further and offers the concept of screening as a way to identify qualities deemed necessary. In this case, the less informed party is the one attempting to derive information about the more informed party.

Most money and banking books (Croushore, 2007; Ritter, Silber and Udell, 2009) often cite the use of collateral and loan covenants as a means to overcome or dissipate information asymmetries. Typically, borrowers know more about themselves and their business prospects than lenders. To circumvent adverse selection, lenders impose collateral requirements on their borrowers to protect themselves against default. To deal with problems that may arise from moral hazard, such as a business owner using loan funds inappropriately, lenders often include covenants in their loan contracts. Covenants are legally enforced contract addendums that require the borrower to use funds as agreed.

A new stream of research has begun to look at the use of loan maturities as a way to combat these asymmetries in information. Diamond and Rajan (2001) find that as borrower risk increases, the use of short term loans increases. Indeed, Berger et al. (2005) find that this holds for loans that do not use covenants. These studies allow us to conclude that maturity is indeed an instrument lenders can use to circumvent some of the negative information asymmetry issues they may encounter with borrowers.

Ortiz-Molina and Peñas (2006) differentiate themselves from mainstream maturity studies in that they focus on small business loans instead of debt securities. The small business environment is a high risk environment and one where information asymmetries prevalently exist (Berger and Udell 1998). Additionally, other lines of credit extended outside of the small business arena tend to have collateral that fully guarantees the loan, as is the case with auto or home loans. Ortiz-Molina and Peñas (2006) find that shorter loan terms are in fact utilized by lenders to minimize the risk exposure inherent in small businesses and the information asymmetries they create.

Two other studies that have also focused on the small business environment and how maturity structure differs for these types of firms are Scherr and Hulburt (2001) and Berger et al (2005). Scherr and Hulburt (2001) find that a small firm's loan maturity is affected by the maturity of the firm's assets, its capital structure, and default probabilities. They also find that the firm's growth options, levels of asymmetric information, and tax status do not affect loan maturity. Berger et al (2005), on the other hand, find that reducing information asymmetries through the use of information gathering and the use of small business credit scoring does factor into the time to maturity of business loans.

It is fitting to continue to study how financial institutions mitigate information asymmetries within the small business environment and to further develop the research on loan maturity structures as they apply to equal credit opportunities for all. Ortiz-Molina and Peñas (2006) find small businesses that use collateral, have better credit and financial stability, and are more informationally transparent usually qualify for longer maturities on their loans. The authors conclude that lenders prefer shorter maturities as a way to increase supervision of loans. Borrowers must submit to more frequent contract refinancing options, and lenders are able to manage information asymmetries better.

As it stands, lenders tend to work with minority business owners and female business owners far less than with non-minority and male business owners. In fact, of the 1,553 businesses analyzed in this study, only 46 are owned by Hispanics, while 22 are owned by Blacks. There are 1,358 businesses owned by men, while there are 193 female owned businesses (see Table 1). Since lenders are less familiar with minority and female business owners, they may view them as a riskier segment of the small business market.

Research has shown that discriminatory lending practices exist when approving/denying loans to minority or female business owners. It has also been shown that when some of these underrepresented groups manage to obtain financing, their interest rates are significantly higher than their non-minority/male counterparts (Blanchflower, Levine and Zimmerman, 2003; Cavalluzzo, Cavalluzzo and Wolken, 2002; Cavalluzzo and Cavalluzzo, 1998; Cavalluzzo and Wolken, 2005; and Schauer and Soden, 2001). If the same were to translate to other loan terms, it stands to reason that minority business owners may also encounter shorter maturities on their loans.

While the aforementioned studies have all focused on the fact that loan maturities are imposed upon borrowers, one cannot rule out that some borrowers may alter or choose their loan maturities willingly. Small business borrowers that are not financially sound and are deemed high risk by lenders may choose different maturity structures than small business owners that are financially stronger. Firms that are not as financially sound may be less inclined to obtain short term loans voluntarily because of risks inherent with eventual refinancing. They realize they can save money on interest expenses associated with shorter

loan terms, but they are unwilling to face the aforementioned risks (Jun and Jen, 2003). Indeed, Strahan (1999) finds that lower quality borrowers are more willing to accept high interest rates.

The converse, then, would find that financially sound firms would be more inclined to obtain short term loans because they are not as susceptible to the risks inherent in subsequent refinancing. They also have the advantage of the lower interest costs associated with short term loans. As such, less risky firms would more often opt for shorter loan terms. Janjigian (1994) finds that borrowers do indeed face the decision of opting for a long loan term as a way to reduce monthly debt obligations or a short term loan to facilitate lower interest costs over the life of the loan.

Just how much bargaining power a firm has to renegotiate loan terms is closely linked with the strength of the lending relationship that exists between the borrower and lender. Bodenhorn (2003) finds that a longer lending relationship usually provides the borrower with lower loan costs and a greater possibility of renegotiating loan terms. Boot and Thakor (1994) and Diamond (1991) also find that financially strong borrowers with longer lending relationships to the lender will attempt to signal their creditworthiness in attempts to lower interest rates. The longer lending relationship allows for more flexible contracts and efficient renegotiation of loan terms.

Diamond (1991), however, differs from the findings presented by Jun and Jen (2003) and Strahan (1999), in that financially unsound firms tend to gravitate more towards short term loans because of the difficulties inherent with obtaining long term loans. A firm's relative financial weakness is known by the borrower, but should also be evident to the lender. As such, the interest rates that may accompany long term loans will be even higher to reflect the additional risk borne by the lender. In order to avoid such high financing costs, weak firms would rather contend with potential refinancing issues associated with short term loans than with the higher loan costs associated with long term loans.

Certainly, literature on the use of loan maturities to contend with information asymmetries, whether imposed by the lender to limit risk exposure or selected by the borrower to minimize costs or circumvent future financing difficulties, is inconclusive. Some studies point to the notion that the riskier the borrower, the shorter the loan maturity, while others find that the riskier the borrower the longer the loan maturity. All these studies have assessed the relationship between borrower risk levels and loan maturities, but have only used financial positioning as a measure of the risk inherent in borrowers. There is an intangible risk associated with lending to groups of individuals to whom one is not necessarily accustomed to transacting with. Minority and female borrowers are overwhelmingly less prone to receive small business loans. This unfamiliarity may breed a sort of distrust or uncertainty about the risk associated with these groups as borrowers. There is no literature to date that has examined how minorities and females fare with the non-price loan terms on their small business loans when their ethnicity or gender is considered as a possible contribution to their overall risk level.

## DATA AND VARIABLE DEFINITIONS

In order to look into loan term differences between minority owned businesses and white owned businesses and female and male owned businesses, I use the Federal Reserve's Survey of Small Business Finances (SSBF) to obtain information on small businesses with less than 500 employees. Information such as firm and owner characteristics, use of other financial services, recent loan activities, lender characteristics, and financial statements is provided. The information provided in the 2003 SSBF is slightly different from the information provided in the 1998 SSBF in that the recent survey provides demographic characteristics for as many as three of the business owners thereby providing more explicit information with regard to race/ethnicity and gender.

The 2003 version of the SSBF includes information on 4,240 small businesses in operation at the time the survey was administered in December of 2003. The actual data collection for this survey occurred between June 2004 and January 2005, and the firms interviewed are "non-governmental, non-financial, non-agricultural for profit" firms. The 4,240 firms are representative of firms in 72 different strata according to business size, census division, and rural or urban location. Due to missing data and imputed variables, there are 5 implicates for a total of 21,200 observations, however, imputed variables may differ from implicate to implicate.

Data imputation is used to predict the values of missing data by using non-missing data. The 2003 SSBF uses multiple imputation to address potential biases due to missing data. This is particularly important in a small business survey because it may be difficult to obtain operations and financial data for many of the businesses surveyed. Appropriately addressing missing data differences across gender and minority groups is also important because there is the possibility that response rates vary substantially across questions for these groups. Multiple imputation involves the generation of multiple values for each missing data, then using those values to iteratively assess survey data. By using multiple imputation, the SSBF creates five replicate datasets to appropriately deal with those cases where respondents did not know how to provide an answer or refused to provide one altogether. Non-missing values are identical across all five implicates, while imputed variables might differ.

Loan term differences across groups are analyzed using regression analysis and the decomposition method discussed below. The explanatory variables are grouped into firm specific characteristics, market characteristics, and loan specific characteristics. These variable groupings are selected based on the work of Ortiz-Molina and Peñas (2006) and Scherr and Hulburt (2001). They include the effect that relationship lending may have on maturity terms, as well as information on the financial health/default probabilities of the firm in question. Combining the variable suggestions from the two articles provides the most comprehensive insight into loan term decision. The groups to be compared are Whites and Hispanics, Whites and Blacks, and Men and Women. In comparing groups, the definitions for minority or female owned businesses as provided by the Small Business Administration are used. A firm is considered minority owned or female owned when at least 51% of the firm is owned by a minority or a female.

The dependent variable in question for all groups is the maturity assigned to their business loans. The variable is denoted in monthly terms, however, I further classify loans into two groups of long and short term loans. As per the Small Business Administration, long term business loans are those loans with a maturity greater than 12 months, while short term business loans are those loans with a maturity less than 12 months (Black and Rosen, 2008; Fraser, Rhee and Shin, 2002). The dependent variable then becomes a binary variable, where a value of one signifies a long term loan, and a value of 0 signifies a short term loan (denoted by Mat).

The firm specific characteristics include the length of the relationship the borrower has with a lender. The 2003 SSBF asks respondents to disclose how long they had conducted business with the lending institution at the time the loan was solicited. The answer provided is in months. Elyasiani and Goldberg (2004) find that relationships between lenders and borrowers increase the availability of funds and provide for more favorable loan rates. Bodenhorn (2003) notes that the longer a relationship exists between lender and borrower, the more likely that the borrower will encounter smaller credit costs and more frequent renegotiations of loan contracts. While I initially note that riskier groups (i.e. minority and female owned businesses) might be subjected to shorter loan terms as a way to increase contract renegotiations and monitoring by the lender, there is also the possibility that a longer lender-borrower relationship may actually serve to shorten loan maturities. The lengthier the relationship the borrower has with their lender, the more capacity they have to renegotiate terms (Bodenhorn, 2003). In the mortgage

industry, homeowners will often agree to shorter loan terms in order to reduce the interest owed on their loans. If this happens in the small business arena, perhaps borrowers with lengthier relationships to their lenders may also be rewarded with such options, prompting lower interest rates in exchange for shorter loan maturities.

The geographic proximity of the firm to the lending bank may also affect loan terms. The 2003 SSBF asks the respondents to disclose how many miles from their place of business the lending institution is located. Degryse and Ongena (2002) find that as the distance between the borrowing firm and the lending bank narrows, loan rates tend to decrease. The converse holds true for when the geographic distance between lender and borrower increases.

Another firm specific characteristic includes the age of the firm in years, which can be used to gauge the reputation and the financial prospects of a firm. The 2003 SSBF asks respondents how many years have transpired since their firm was established. Martinelli (1997) finds that firm age helps facilitate access to credit. Lenders are wary of new firms since they do not have an established history of repayment or business transactions from which to establish precedent. The longer a firm survives, the greater a reputation it builds. Finally, the financial health of the firm is assessed by its Dunn & Bradstreet credit score. This score predicts the likelihood of default for business borrowers. The score is used heavily by lenders in order to determine whether a loan will be provided and the terms and conditions imposed on given loans (Berger et al, 2005). In the 2003 SSBF, it ranges from a score of one to six, with one representing the riskiest firms and six representing the least risky.

The market characteristic used in this study assesses the amount of financial institution competition in the borrowing businesses' market. Berkovec, et al. (1998) and Cavalluzzo, Cavalluzzo, and Wolken (2002) both posit that discrimination is more evident in less competitive markets. Increased competition between financial institutions reduces the disparities in loan availability between minorities and whites. The Survey of Small Business Finances provides the representative Herfindahl score which sums the squared market share of banks/similar financial institutions (times 10,000) and is divided into three categories. A category of 1 represents a Herfindahl sum of between 0 and 1,000. A category of 2 represents a Herfindahl sum of 1,000 up to a sum of 1,799. The third category represents a sum greater than 1,800. The higher the category, the greater the level of competition amongst banks at the borrowing firm's location. While looking at the firm and its market characteristics is important, the terms of the loan in question should also be assessed. The dollar amount of the loan is included as a control variable, as is the interest rate on the loan in question.

## METHODOLOGY

In this study, I look at what is traditionally used as a standard for pre-qualifications of loan applicants. When a borrower solicits a loan, they are often evaluated on criteria that include their credit (previous payment histories), their capital (how much money they can provide up front for their business endeavors), their capacity (their employment history and earnings) and the collateral they are able to provide as a guarantee for the loan. Based on the above, borrowers with similar backgrounds should have similar maturities imposed on their loans. Due to the fact that discriminatory practices have in fact been assessed in previous studies (Blanchflower, Levine and Zimmerman, 2003; Cavalluzzo, Cavalluzzo and Wolken, 2002; Cavalluzzo and Cavalluzzo, 1998; Cavalluzzo and Wolken, 2005; and Schauer and Soden, 2001), I look at whether minority and female applicants of similar characteristics to their non-minority and male counterparts will encounter different maturities imposed on their loans.

Any discriminatory practice would be due in part to the notion that lenders may qualify minority or female borrowers as being higher risk than non-minorities or males because of their unfamiliarity with the

groups. It is important to differentiate, however, that any type of discrimination evidenced may be more statistical than prejudicial. Statistical discrimination may arise due to the fact that most small business owners are white and male, and lenders, less familiar with minority and female applicants, may not be able to correctly assess their risk levels. Ethnicity/race or gender, in a sense, becomes a signal for identification and risk placement. Prejudicial discrimination occurs when lenders decline credit or offer less beneficial credit terms to individuals due to an outright dislike for a particular group (defined by gender or ethnicity/race).

It is imperative to understand whether lenders mitigate information asymmetries differently for different groups of individuals because of the implications this has on credit accessibility and firm performance for minorities and women. The Small Business Administration readily recognizes that small businesses often contend with credit rationing by lenders, and previous studies have shown how minorities and women often face less favorable price and non-price loan factors than their white and male counterparts. It stands to reason then that minority and female small business owners may have to contend with fewer numbers of available loans and less favorable loan terms. Many times, research into whether or not minorities or women encounter different lending practices focuses on the obvious price factors such as interest rates or the loan approval or denial rates of said groups. Very little focus has been placed on disparities in non-price loan factors, as most studies have focused on loan denial or approval rates and whether the price of the loan, through higher interest rates, is more costly for certain segments of the population (Blanchflower, Levine and Zimmerman, 2003; Cavalluzzo, Cavalluzzo and Wolken, 2002; Cavalluzzo and Cavalluzzo, 1998; Cavalluzzo and Wolken, 2005; and Schauer and Soden, 2001).

Group comparisons involve estimating regressions on the factors related to loan maturity terms, with separate regressions created for each group. The dependent variable is regressed against a set of independent variables, and the estimated coefficients for each regression, along with the group means, are used to develop the decomposition. Studying group differences is best done with a decomposition analysis, as opposed to a single regression with an identifying dummy variable to indicate race or gender. The latter assumes coefficients are the same for both groups and assumes differences are present only in the indicator variable for ethnicity/gender.

The Blinder-Oaxaca decomposition allows us to note how much of the difference in the dependent variable is accounted for by group differences in the independent variables. Jann (2008) provides information on this two-fold decomposition technique where explained and unexplained factors determine differences in the dependent variable. The model is written as follows

$$R = [E(X_W) - E(X_H)]'\beta^* + [E(X_W)'(\beta_W - \beta^*) + E(X_H)'(\beta^* - \beta_H)]. \quad (1)$$

The first part of the decomposition, $[E(X_W) - E(X_H)]'\beta^*$, represents the part of the dependent variable differential that can be explained by differences in the independent variables. The second part of the decomposition, $[E(X_W)'(\beta_W - \beta^*) + E(X_H)'(\beta^* - \beta_H)]$, represents the part of the dependent variable differential that is unexplained by the independent variables. This unexplained component is usually indicative of discrimination (Jann 2008), but can also exist if variables which can contribute to the dependent variable differential are omitted. Once the decomposition is obtained, the results will indicate how much of the differential in maturity terms is accounted for by differences in the independent variables. Whatever is not accounted for by the independent variables is either unexplained or it is indicative of discrimination (Jann 2008).

To begin the comparison, I define two groups: White owned businesses (w) and Hispanic owned businesses (h). The dependent variable in question for both groups is the loan maturity of their business loans, classified as a short term loan or a long term loan. The dependent binary variable, denoted by Mat,

then takes on a value of one if the loan is deemed a long term loan and zero if it is deemed a short term loan. An analysis of the tabulated frequencies of the count data associated with loan maturity shows most observations (about 48%) fall under the twelve month frequency with the rest minimally distributed at later monthly intervals. As such, the variable lends itself to identification as a binary variable.

A more detailed example of the decomposition would be as follows:

$$Mat_w = a_w + b_wFirm_w + c_wMarket_w + d_wLoan_w + e_wIdent_w \quad (2)$$

$$Mat_h = a_h + b_hFirm_h + c_hMarket_h + d_hLoan_h + e_hIdent_h \quad (3)$$

where Mat represents the long or short term maturity status of the loan. Firm represents a vector of firm characteristics that includes the relationship length between the lender and borrower in months, the geographic proximity of the firm to the lending institution in miles, the firm age measured in years, and the Dunn and Bradstreet credit score ranging from a value of one to six.

Market represents the Herfindahl score indicative of bank competition levels in the business's locale. Loan represents a vector of loan characteristics that includes the amount of the loan in dollars divided by one million and the interest rate on the loan. Identifying represents the identifying characteristic of gender for each group. The subscripts of w and h represent a White owned business and Hispanic owned business, respectively. The coefficients, b, c, d, and e, are estimated using regression analysis for White (w) and Hispanic (h) owned businesses.

The difference in the mean loan maturity across the two groups is represented as follows:

$$\begin{aligned} Mat_w - Mat_h = {} & a_w + b_wFirm_w + c_wMarket_w + d_wLoan_w + e_wIdent_w - \\ & (a_h + b_hFirm_h + c_hMarket_h + d_hLoan_h + e_hIdent_h), \end{aligned} \quad (4)$$

which can be rewritten as:

$$\begin{aligned} Mat_w - Mat_h = {} & b_w(Firm_w - Firm_h) + c_w(Market_w - Market_h) + d_w(Loan_w - Loan_h) + e_w(Ident_w - Ident_h) + \\ & (a_w - a_h) + (b_w - b_h)Firm_h + (c_w - c_h)Market_h + (d_w - d_h)Loan_h + (e_w - e_h)Ident_h \end{aligned} \quad (5)$$

where $R = Mat_w - Mat_h$ and R represents the difference in loan maturities between groups. $E = b_w(Firm_w - Firm_h) + c_w(Market_w - Market_h) + d_w(Loan_w - Loan_h) + e_w(Ident_w - Ident_h)$ and represents the part of the difference in loan maturities between groups that can be explained by differences in the average characteristics of the White and Hispanic owned businesses. If White and Hispanic owned businesses had the same average firm, market, loan, and identifying characteristics, the explained portion of the decomposition would equal zero.

$$U = (a_w - a_h) + (b_w - b_h)Firm_h + (c_w - c_h)Market_h + (d_w - d_h)Loan_h + (e_w - e_h)Ident_h \quad (6)$$

and represents the part of the difference in loan maturities between groups that cannot be explained. If the coefficients (a, b, c, d, and e) were the same for White and Hispanic owned businesses one could conclude that any difference in loan maturity terms would exist solely due to differences in firm, market, loan, and identifying characteristics of the groups.

The difference in maturities is equal to the sum of the coefficients for White owned businesses multiplied by the differences in average firm, market, loan, and identifying characteristics between groups plus the

sum of the firm, market, loan, and identifying characteristics for Hispanic owned businesses multiplied by the difference in estimated coefficients between groups.

Dividing E by R shows us what percentage of the difference in loan maturities is explained by differences in the firm, market, loan, and identifying characteristics of the businesses. Dividing U by R shows us what percentage of the difference in loan maturities remains unexplained (Shannon, n.d.).

The same model will be estimated to determine if differences between White owned businesses (w) and Black owned businesses (b) exist:

$$Mat_w - Mat_b = b_w(Firm_w - Firm_b) + c_w(Market_w - Market_b) + d_w(Loan_w - Loan_b) + e_w(Ident_w - Ident_b) + (a_w - a_b) + (b_w - b_b)Firm_b + (c_w - c_b)Market_b + (d_w - d_b)Loan_b + (e_w - e_b)Ident_b \quad (7)$$

and Male owned businesses (m) and Female owned businesses (f)

$$Mat_m - Mat_f = b_m(Firm_m - Firm_f) + c_m(Market_m - Market_f) + d_m(Loan_m - Loan_f) + e_m(Ident_m - Ident_f) + (a_m - a_f) + (b_m - b_f)Firm_f + (c_m - c_f)Market_f + (d_m - d_f)Loan_f + (e_m - e_f)Ident_f \quad (8)$$

## RESULTS

The descriptive statistics for the respective groups in Table 1 highlight differences, particularly with regard to the maturity on the loans provided to the business owners, the relationship length the borrowers have with their lenders, the age of the small business in question, the risk level associated with each business, the amount of the loan and the interest rates assigned to the loans.

The longer loan maturity Black business owners encounter contradicts the notion set forth in some studies (Diamond and Rajan, 2001; Berger et al, 2005; Ortiz-Molina and Peñas, 2006). They find that this non-price loan term can be shortened in order to facilitate more monitoring of riskier firms, particularly when these Black owned businesses have shorter relationship lengths with their lenders, are further geographically from the lending institution, are less established (as evidenced through the younger firm age) and have an overall riskier assessment as established by the Dunn and Bradstreet credit score. The average size of the business loans in question would also not warrant longer loan terms as the amount borrowed by Black owned businesses is much smaller than the amount borrowed by White owned businesses. The loan maturity for Black owned businesses, however, is consistent with the average interest rate they obtain on their loans.

A higher interest rate is usually associated with longer term loans as these are deemed riskier than short term loans (Croushore, 2007). The longer a lending institution is without its funds, the more risk it is exposed to. The risk return tradeoff warrants a higher return to the lender for contending with additional risk. It is also understood that lenders may opt for shorter loan terms in order to facilitate lower interest rates. The stronger the firm's reputation and the longer the relationship between borrower and lender, the more power the borrower has for negotiating its loan terms (Bodenhorn, 2003). This may be the case with White owned businesses that display lengthier relationships with their lenders and have more established businesses and less risky credit scores.

Data for Hispanic owned businesses show a similar situation. Relative to their White owned business counterparts, Hispanic owned firms on average were granted lengthier loan maturities despite the fact that they had shorter relationships with their lenders, had less established firms, and were deemed riskier per the Dunn and Bradstreet credit score. Hispanic owned business loan amounts were also substantially smaller than the loan amounts granted to White owned businesses. The one similarity between Black-

Table 1. Description of firm, market, and loan characteristics by race/ethnicity and gender

| | | Race/Ethnicity | | | Gender | |
|---|---|---|---|---|---|---|
| Variables | All | White | Hispanic | Black | Male | Female |
| Loan Maturity (dependent variable) | | | | | | |
| % Long term ( > 12 months) | 57.1 | 55.6 | 67.5 | 90.9 | 56.3 | 59.3 |
| % Short term (<= 12 months) | 42.9 | 44.4 | 32.5 | 9.1 | 43.7 | 40.7 |
| Firm Characteristics | | | | | | |
| Relationship length (months) | 97.53 | 99.56 | 78.96 | 31.50 | 99.91 | 84.42 |
| Geographic proximity to Bank (miles) | 53.83 | 53.97 | 43.92 | 63.45 | 50.98 | 69.55 |
| Firm age (years) | 15.48 | 15.72 | 11.70 | 9.94 | 15.94 | 12.90 |
| D&B credit score | 3.69 | 3.73 | 3.39 | 2.45 | 3.72 | 3.54 |
| Market Characteristic | | | | | | |
| Competition | 2.41 | 2.43 | 2.02 | 2.19 | 2.40 | 2.45 |
| Loan Characteristics | | | | | | |
| Amount of loan (/1,000,000) | 0.32 | 0.33 | 0.12 | 0.09 | 0.35 | 0.15 |
| Loan interest rate (%) | 6.39 | 6.26 | 8.13 | 9.92 | 6.32 | 6.78 |
| Gender | | | | | | |
| Male (%) | 84.66 | 84.72 | 83.10 | 84.34 | - | - |
| Female (%) | 15.34 | 15.28 | 16.90 | 15.66 | - | - |
| Number of observations | 1553 | 1484 | 46 | 22 | 1358 | 193 |

Source: Estimates based on the Federal Reserve's Survey of Small Business Finances 2003

owned businesses and Hispanic owned businesses is that they too encounter higher interest rates on average, relative to White owned businesses. As previously mentioned, the higher interest rates experienced by Hispanic owned businesses do correspond to the lengthier loan terms they obtain, as these longer loans are deemed riskier to the lender.

The data on male owned businesses indicates that on average they contend with shorter loan terms than female owned businesses. Male owned businesses also tend to have lengthier established relationships with their lenders, more established businesses (as evidenced by the larger firm ages), and lower risk credit scores. The loan amounts obtained by male owned businesses are significantly larger than the loan amounts obtained by female owned businesses, while the interest rates female owned businesses tend to average are higher than the interest rates offered to male owned businesses. This again contradicts the notion that the riskier firms (in this case, female-owned businesses) should encounter shorter loan terms in order to facilitate more frequent renegotiations by the lender. However, the higher interest rates female

owned businesses receive align with the longer loan terms they encounter, as longer loan terms are riskier and require a higher return to the lender (Croushore, 2007).

There is also a difference with regard to the level of banking competition that the various businesses encounter. White owned businesses are generally located in areas where there are greater concentrations of banks/financial institutions, while Hispanic and Black owned businesses are in areas where banking competition exists to a lesser degree. The situation between male and female owned businesses differs in that on average, female owned businesses are located in areas where there is a greater amount of banking competition, relative to male owned businesses.

In order to achieve a better understanding of loan terms across groups, loan maturity means are assessed for the racial/ethnic and gender groups when limiting the assessment to all loans under $100,000 and then all loans under $50,000. On average, White owned firms obtain business loans in the realm of $330,000 while Hispanic and Black owned businesses obtain business loans that average $120,000 and $90,000, respectively.

The means tell a similar story when looking at loans under $100,000. In this case, White owned businesses tend to obtain shorter loans with an average maturity of 44.8 months, while Hispanic owned businesses obtain loans with an average of 70.2 months and Black owned businesses obtain loans with an average of 48.1 months. Male owned businesses average 45.0 months on their loans while female owned businesses obtain loans with an average of 50.2 months. In the aforementioned instances, the "less risky" groups (White and male owned businesses) both encounter shorter loan maturities. This continues to contradict studies (Diamond and Rajan, 2001; Berger et al, 2005; Ortiz-Molina and Peñas, 2006) which contend that riskier groups tend to obtain shorter loan maturities for more frequent contract renegotiations between lender and borrower. The constant in this case is that the borrowers with the shortest loan maturities (White and male owned businesses) again have the lowest average interest rates on their loans. This follows the notion that shorter loan terms are less risky to the lender and therefore require a lower return (in the form of interest rates) for the lender (Croushore, 2007).

The situation changes somewhat, however, when loan maturity means are gathered for all loans under $50,000. In this case, White owned businesses have average loan maturities of about 45.5 months while Black owned businesses have loan maturities of 48.4 months. Hispanic owned businesses, however, encounter shorter loan maturities of about 43.5 months. Male owned businesses average about 44.8 months on their loans while female owned businesses average about 48.5 months on their loans. Nevertheless, the fact that this situation only changes once leads us to believe that on average, less risky groups tend to see shorter maturities on their loans.

The decomposition results in Table 2a and b show that the differences between loan maturities that exist between White-owned businesses and Hispanic and Black owned businesses can be mostly attributed to the relationship length that borrowers maintain with their lenders. Almost 68% of Hispanic owned businesses have longer loan terms compared to 56% of White owned businesses, a 12 percentage point differential. Almost 12% of this differential is explained by differences in borrower-lender relationship length, and 8.3% by differences in interest rates across the two groups.

About 91% of Black owned businesses are likely to have long term loans, 35 percentage points above the average for White owned businesses. About 13% of this gap is explained by the relationship between lender and borrower, while 6% is explained by the interest rates obtained on the business loans. A similar story holds for the gap in loan maturities evidenced by male and female owned businesses. Female owned businesses obtain long term loans 59% of the time, while male owned businesses obtain long term loans

**Table 2a. Decomposition of differences in loan maturity terms by race/ethnicity and gender**

| | Decomposition Analysis | | | | | |
|---|---|---|---|---|---|---|
| | Race/Ethnicity | | | | Gender | |
| | Hispanic | | Black | | Female | |
| | Factor | % | Factor | % | Factor | % |
| White loan maturity | 0.5582 | | 0.5582 | | | |
| Male loan maturity | - | | | | 0.5619 | |
| Specific group loan maturity | 0.6754 | | 0.9088 | | 0.6080 | |
| Difference | -0.1172 | | -0.3505 | | -0.0461 | |
| *Explained* | | | | | | |
| Firm Characteristics | | | | | | |
| Relationship length (months) | -0.0143 | 12.2 | -0.0471 | 13.4 | -0.0108 | 23.4 |
| Geographic proximity to bank | 0.0005 | -0.4 | -0.0005 | 0.1 | -0.0006 | 1.3 |
| Firm age (years) | 0.0074 | -6.3 | 0.0106 | -3.0 | 0.0068 | -14.8 |
| D&B credit score | -0.0004 | 0.3 | -0.0014 | 0.4 | -0.0002 | 0.4 |
| Market Characteristic | | | | | | |
| Competition | 0.0120 | -10.2 | 0.0070 | -2.0 | -0.0014 | 3.0 |
| Loan Characteristics | | | | | | |
| Amount of loan (/1,000,000) | -0.0021 | 1.8 | -0.0024 | 0.7 | -0.0019 | 4.1 |
| Loan interest rate (%) | -0.0097 | 8.3 | -0.0192 | 5.5 | -0.0022 | 4.8 |
| Gender | | | | | | |
| Female | -0.0004 | 0.3 | -0.0001 | 0.0 | - | - |
| Race/Ethnicity | | | | | | |
| Hispanic | - | - | - | - | -0.0004 | 0.9 |
| Black | - | - | - | - | -0.0001 | 0.2 |
| All included explained variables | -0.0070 | 6.0 | -0.0531 | 15.1 | -0.0108 | 23.3 |

*Source: Estimates based on the 2003 Federal Reserve's Survey of Small Business Finances*

56% of the time. About 23% of this gap is also explained by the relationship between the lender and borrower and 5% is explained by the loan interest rates.

The same holds true for the explanation of the difference in maturity loan terms between men and women. The second most important factor has to do with interest rates. In all comparison cases, interest rates also serve to explain some of the discrepancies evidenced in loan maturity terms between groups.

While the results do not show that minority and female owned businesses obtain shorter maturities on their loan terms (ruling out the notion that they may be deemed riskier and therefore require more frequent loan renegotiations facilitated by shorter loan terms), it is evident that White and male owned businesses, with lengthier relationships and lower interest rates do find shorter maturities on their loans. This brings us back to the Bodenhorn (2003) study. The longer the relationship between lender and borrower, the easier it is for borrowers to suggest changes in loan terms. Shorter loan terms would be correlated with lower interest rates, following the notion that long term loans are deemed riskier by lenders and therefore require a higher return in the form of higher interest rates (Croushore, 2007). In

fact, White and male owned businesses, across the board and for different loan amount categories, universally see lower interest rates on their loans.

**Table 2b. Decomposition of differences in loan maturity terms by race/ethnicity and gender**

| | Decomposition Analysis | | | | | |
|---|---|---|---|---|---|---|
| | Race/Ethnicity | | | | Gender | |
| | Hispanic | | Black | | Female | |
| | Factor | % | Factor | % | Factor | % |
| *Unexplained* | | | | | | |
| Firm Characteristics | | | | | | |
| Relationship length (months) | -0.0633 | 54.0 | -0.0165 | 4.7 | 0.0458 | -99.3 |
| Geographic proximity to bank | -0.0824 | 70.3 | 0.0085 | -2.4 | -0.0009 | 2.0 |
| Firm age (years) | -0.1093 | 93.3 | 0.0535 | -15.3 | -0.1470 | 318.9 |
| D&B credit score | -0.0980 | 83.6 | 0.1979 | -56.5 | 0.1761 | -382.0 |
| Market Characteristic | | | | | | |
| Competition | 0.4143 | -353.5 | 0.5478 | -156.3 | -0.0913 | 198.0 |
| Loan Characteristics | | | | | | |
| Amount of loan (/1,000,000) | 0.0188 | -16.0 | -0.0038 | 1.1 | 0.0121 | -26.2 |
| Loan interest rate (%) | 0.4643 | -396.2 | -0.2196 | 62.7 | -0.0841 | 182.4 |
| Gender | | | | | | |
| Female | 0.0676 | -57.7 | 0.0296 | -8.4 | - | - |
| Race/Ethnicity | | | | | | |
| Hispanic | - | - | - | - | 0.0074 | -16.1 |
| Black | - | - | - | - | 0.0085 | -18.4 |
| Constant | -0.7221 | 616.1 | -0.8948 | 255.3 | 0.0381 | -82.6 |
| All included unexplained variables | -0.1101 | 93.9 | -0.2974 | 84.9 | -0.0353 | 76.6 |

Source: Estimates based on the 2003 Federal Reserve's Survey of Small Business Finances

## CONCLUSION

The minority and female owned businesses in this study are riskier than their non-minority and male owned business counterparts as they have been established for fewer years and have lower credit scores. Coupled with that is the fact that lenders deal significantly less with minority and female business owners on the whole. On average, White owned businesses experience shorter maturities on their loan terms relative to Hispanic and Black owned businesses. Male owned businesses also encounter shorter loan maturities than female owned businesses. This contradicts the notion put forth by Diamond and Rajan (2001), Berger et al (2005), and Ortiz-Molina and Penas (2006), who argue that riskier borrowers usually find shorter loan maturities imposed on their loans as lenders attempt to mitigate their risk exposure.

The findings of this paper fall more in line with the results portrayed in Bodenhorn's (2003) study where firms with longer established relationships to their lenders might have more power to negotiate their loan terms in order to receive lower loan costs. Boot and Thakor (1994) and Diamond (1991) also find that borrowers may attempt to signal their creditworthiness by opting for shorter loan terms, demonstrating their ability to contend with higher monthly payments and unafraid of refinancing risks that lower credit quality borrowers may have to contend with (Jun and Jen, 2003; Strahan, 1999). These less risky firms know that by opting for shorter loan maturities, they can decrease their overall borrowing costs (Janjigian, 1994).

The limitations of the study undertaken in this paper include the small sample size evidenced by minority and female borrowers. In order to obtain the variables required for the analysis in the study, I forgo using the entire sample and limit my analysis to those borrowers who have been approved for loans within the past three years. This subsample provides the most detailed elements of the loan experience, but as such, it significantly limits the sample size. The disproportionate underrepresentation of Black, Hispanic, and female business owners (relative to nationally observed statistics) could be due to the fact that these groups have less access to credit. This could be due to lender hesitation to grant them loans, or it could be due to the fact that some of these groups do show some reluctance to seek out mainstream financing for business ventures (sometimes opting to provide their own savings or to obtain loans from family member).

Another limitation is that the database does not establish whether loan terms are imposed by the lenders or self-imposed by the borrowers; it is not evident if the non-price loan terms are chosen by borrowers in order to obtain more favorable loan terms. A pattern in the decomposition results is noticeable, however, where the gap between minority and non-minority owned businesses is mainly explained by the relationship length between borrower and lender and the interest rates imposed on the loans. The same findings are evident between male and female owned businesses.

## REFERENCES


[1] Akerlof, George A. (1970) The market for lemons: Quality uncertainty and the market mechanism, Quarterly Journal of Economics, 84:488-500.

[2] Berger, Allen N., Marco A. Espinosa-Vega, W. Scott Frame, and Nathan Miller (2005) Debt maturity, risk, and asymmetric information, The Journal of Finance, 60:2895-2923

[3] Berger, Allen N., and W. Scott Frame (2007) Small business credit scoring and credit availability, Journal of Small Business Management, 45:5-22

[4] Berger, Allen N., W. Scott Frame, Nathan H. Miller (2005) Credit scoring and the availability, price, and risk of small business credit, Journal of Money, Credit, and Banking, 37:191-222.

[5] Berger, Allen N. and Gregory F. Udell (1995) Relationship lending and lines of credit in small firm finance, Journal of Business, 68:351-381

[6] Berger, Allen N. and Gregory F. Udell (1998) The economics of small business finance: the roles of private equity and debt markets in the financial growth cycle, Journal of Banking and Finance, 22:613-673

[7] Berger, Allen N. and Gregory F. Udell (2005) A more complete conceptual framework for SME financing, Journal of Banking and Finance, 30:2945-2966

[8] Berkovec, James A., Glenn B. Canner, Stuart A. Gabriel, and Timothy H. Hannan (1998) Discrimination, competition, and loan performance in FHA mortgage lending, The Review of Economics and Statistics, 80:241-250.

[9] Black, Lamont K. and Richard J. Rosen (2008) The effect of monetary policy on the availability of credit: how the credit channel works, Federal Reserve Bank of Chicago working paper No. 2007-13

[10] Blanchflower, David G., Phillip B. Levine, and David J. Zimmerman (2003) Discrimination in the small-business credit market, The Review of Economics and Statistics, 85(4):930-943

[11] Bodenhorn, Howard (2003) Short term loans and long term relationships: Relationship lending in early America, Journal of Money, Credit and Banking, 35: 485-505

[12] Boot, Amoud W.A. and Anjan V. Thakor (1994) Moral hazard and secured lending in an infinitely repeated credit market game, International Economic Review, 35:899-920

[13] Boot, Arnoud W.A., Anjan V. Thakor, and Gregory F. Udell (1991) Secured lending and default risk: Equilibrium analysis, policy implications, and empirical results, Economic Journal, 101:458-472

[14] Caputo, Richard K. (1998) Women's choice to pursue self employment: the role of financial and human capital of household members, Journal of Small Business Management, 36:8-17

[15] Cavalluzzo, Ken S. and Linda Cavalluzzo (1998) Market structure and discrimination: The case of small businesses, Journal of Money, Credit and Banking, 30:771-792

[16] Cavalluzzo, Ken S., Linda Cavalluzzo, John Wolken (2002) Competition, small business financing, and discrimination: Evidence from a new survey, Journal of Business, 75:641-680

[17] Cavalluzzo, Ken S. and John Wolken (2005) Small business loan turndowns, personal wealth, and discrimination, Journal of Business, 78:2153-2178

[18] Croushore, Dean (2007) Money and Banking**:** A Policy-Oriented Approach. Boston: Houghton Mifflin.

[19] Degryse, Hans and Van Cayseele (2000) Relationship lending within a bank based system: evidence from European small business data, Journal of Financial Intermediation, 9:90-109

[20] Degryse, Hans and Steven Ongena (2002) Distance, lending relationships, and competition, The Journal of Finance, 60:231-266

[21] Delage, Benoit (2002) Results from the Survey of Self Employment in Canada. Ottawa: Applied Research Branch, Human Resources Development Branch.

[22] Diamond, Douglas (1991) Monitoring and reputation: The choice between bank loans and directly placed debt, Journal of Political Economy, 99:688-721

[23] Diamond, Douglas W. and Raghuram Rajan (2001) Banks, short-term debt and financial crises: Theory, policy implications, and applications, Carnegie-Rochester Conference Series on Public Policy, 54:37-71

[24] Elyasiani, Elyas and Lawrence G. Goldberg (2004) Relationship lending: A survey of the literature, Journal of Economics and Business, 56:315-330

[25] Fairlie, Robert W. (2004) Self-employed business ownership rates in the United States: 1979-2003, for the SBA Office of Advocacy

[26] Fairlie, Robert W. (2005) An extension of the Blinder-Oaxaca decomposition technique to logit and probit models, Journal of Economic and Social Measurement, 30:305-316

[27] Fraser, Donald R., S. Ghon Rhee, and Guen Hwan Shin (2002) The impact of interbank

and capital market competition on relationship banking: evidence from the Japanese experience, APEC/University of Hawaii Special Session

[28] Gebremariam, Gebremeskel H., Tesfa G. Gebremedhin and Randall W. Jackson (2004) The role of small business in economic growth and poverty alleviation in west Virginia: An empirical analysis, West Virginia University Regional Research Institute working paper 2004-10.

[29] Green, E. and Cohen, L. (1995) Women's business: are women entrepreneurs breaking new ground or simply balancing the demands of women's work in a new way? Journal of Gender Studies, 4:297–314

[30] Hughes, Karen D. (2003) Pushed or pulled? Women's entry into self employment and small business ownership, Gender, Work, and Organization, 10:433-454.

[31] Hulburt, Heather M. and Frederick C. Scherr (2003) Determinants of the Collateralization of Credit by Small Firms, Managerial and Decision Economics, 24:483-501.

[32] Janjigian, Vahan (1994) Choosing the term on a fixed rate home mortgage: A cash flow perspective, Financial Practice and Education, 4:167-168

[33] Jann, Benn (2008) A Stata implementation of the Blinder Oaxaca decomposition, forthcoming in The Stata Journal

[34] Jun, Sang-Gyung and Frank C. Jen (2003) Trade off model of debt maturity structure, Review of Quantitative Financing and Accounting, 20:5-34

[35] Lowrey, Ying (2006) Women in business: A demographic review of women's business ownership, Small Business Research Summary, 280:1-48

[36] Lowrey, Ying (2007) Minorities in business: A demographic review of minority business ownership, Small Business Research Summary, 298:1-50

[37] Martinelli, Cesar (1997) Small firms, borrowing constraints, and reputation, Journal of Economic Behavior and Organization, 33:91-105

[38] Molina, Hernan Ortiz and Maria Peñas (2006) Lending to small businesses: the role of loan maturity in addressing information problems, Working paper

[39] Rajan, Raghuram and Andrew Winton (1995) Covenants and collateral as incentives to monitor, The Journal of Finance, 4:1113-1146.

[40] Ritter, Lawrence S., William L. Silber, Gregory F. Udell (2009) Principles of Money, Banking and Financial Markets, Addison-Wesley

[41] Schauer, David A. and Dennis L. Soden (2001) Capital access in El Paso: A multivariate

analysis of factors influencing loan approval, Institute for Policy and Economic Development, University of Texas-El Paso.

[42] Scherr, Frederick C. and Heather M Hulburt (2001) The debt maturity structure of small firms, Financial Management, Spring 2001:85-111.

[43] Shannon, Michael (n.d.) A specific example of a Oaxaca decomposition

[44] Spence, A. Michael (1973) Job market signaling, Quarterly Journal of Economics, 83:355-377.

[45] Stiglitz, Joseph E. (1975) The theory of screening, education, and the distribution of income, American Economic Review, 65:283-300.

[46] Stiglitz, Joseph E (1990) Peer monitoring and credit markets, World Bank Economic Review, 4:351-366

[47] Strahan, Philip E. (1999) Borrower risk and the price and nonprice terms of bank loans, Federal Reserve Bank of New York, Staff Reports: 90