TERMS OF LENDING FOR SMALL BUSINESS LINES OF CREDIT: THE ROLE OF LOAN GUARANTEES

Raymond Posey, Mount Union College
Alan K. Reichert, Cleveland State University

ABSTRACT

This study examines the role of loan guarantees in lines of credit granted to small businesses. Since there is evidence of simultaneity among lending terms, two-stage instrumental variable procedures are used to obtain consistent parameter estimates. The findings suggest the presence of a loan guarantee is associated with lower interest rates and smaller lines of credit and that loan guarantees and collateral are to some extent substitutes in that loans guarantees are a close substitute for collateral but collateral does not always serve as a close substitute for loan guarantees. Furthermore, firms with longer banking relationships and/or fewer banking relationships are less likely to have loan guarantees.

JEL: G2

KEYWORDS: Term of lending, bank relationships, line of credit

INTRODUCTION

Numerous authors have investigated the importance of banking relationships in lending to small businesses. For example, Petersen and Rajan (1994) find that small firm borrowing is concentrated among a small number of lenders, indicating substantial benefits to developing and maintaining a strong banking relationship. They conclude that the value of the banking relationship relates more to the availability of credit than to a lower cost of funds. Brick, and Palia (2007) study the interrelationship between interest rate, fees, and collateral in small business loans. They note that all three of these factors, in principle, can be negotiated simultaneously to achieve the required return and suitable level of risk. Their empirical findings provide evidence of jointness or endogeneity among the terms of lending.

Not included in the Brick and Palia study is the role of loan guarantees for small business line of credits (LOC). Both loan guarantees and collateral serve to reduce the loss given default (LGD) of a loan and the pledging of personal loan guarantees may also lower the probability of default. On the other hand, loan guarantees and collateral may introduce a moral hazard if the bank relaxes its lending standards assuming that it is not exposed to either the risk of default or a significant loss at default. Furthermore, loan guarantees and collateral can serve as a form of non-price credit rationing as discussed by Stiglitz and Weiss (1981). Thus, on can argue that loan guarantees and collateral are substitutes in the lending process. On the other hand, both have unique dimensions. For example, of the firm pledges corporate assets such as account receivables or inventories the lender must perfect a lien on the assets, monitor them, and liquidate them in the case of default. This is process can involve significant costs and the marketability of the collateral is always an issues. In the cases of loan guarantees the borrower is often asked to pledge his/her personal assets, such as real estate, stock and bonds, and other personal assets. Thus, in the case of collateral the firm's assets are being pledged while in the case of a personal guarantee borrowers are risking their own assets and possible bankruptcy. In addition, there are third party guarantees of course and in the United States, the U.S. Small Business Administration (SBA) was created to assist small businesses and represents one source of loan guarantees for small businesses.

The focus of this research is on the effect loan guarantees have on the interest rates charged and the size of small business LOCs. Two questions will be addressed. First, what are the factors associated with the use of loan guarantees? Secondly, to what extent does the presence of a loan guarantee affect the interest rate charged and the size of the LOC? Along with these variables, this study will also examine the effects of collateral and compensating balances on the specific terms of LOCs. Two additional variables are included in this study which has not been used in prior research. The strength of the banking relationship is often measured by the length of the relationship. This study includes this measure also includes the number of bank relationships that each firm maintains. Firms which maintain a greater number of bank relationships may have weaker individual banking relationships as they spread their loyalty and business around. On the other hand, they may be able to exploit a competitive credit market and negotiate better lending terms. Because of the expected interplay among loan guarantees, collateral, interest rate, and loan size during loan negotiations, the ratio of the dollar value of credit granted scaled by the requested amount is considered. This variable suggests that the amount of credit extended may be an integral part of the bargaining process and whether the borrower or lender has a comparative advantage in the negotiating process. The reminder of this paper is organized as follows. Section 2 reviews the prior literature, Section 3 discusses the data and methodology, Section 4 presents the empirical findings, while Section 5 presents the conclusion.

LITERATURE REVIEW

Stiglitz and Weiss (1981) discuss the conditions under which credit rationing may occur in markets under equilibrium conditions. The authors suggest that interest rates alone may not be sufficient to screen applicants and distinguish good and bad borrowers. They postulate that expected bank returns might reach a maximum at some interest rate and decline at higher rates because of expected higher rates of default. A similar argument is made for collateral requirements. They conclude that credit rationing may be likely, especially under conditions of imperfect and limited information, a typical aspect of lending to small businesses. Using interest rates alone to screen applicants may also introduce an adverse selection problem in that only the riskiest borrowers may agree to such high interest rates. Because of the importance of small businesses to economic growth and recognizing the possible credit rationing behavior, many nations have introduced loan guarantee programs for small business to counter the expected credit rationing behavior of banks.

A number of authors examine the effects of loan guarantee programs. Camino and Cardone (1999) suggest that policy-makers view loan guarantees as substitutes for collateral. The guarantees are granted to induce lenders to extend credit when collateral is not available. Their study summarizes a number of European loan guarantee programs and provides a framework for further study, but does not reach specific conclusions about the costs or effectiveness of such loan guarantee programs. Riding and Haines (2001) survey previous attempts to evaluate the effectiveness of loan guarantee programs and note widely differing rates of default among national programs. They go on to examine the Canadian experience with its loan guarantee program and find it to be quite cost effective. They find higher default rates among newer firms and varying rates of default by industry. They also find that lenders are quite sensitive to the size or portion of the loan that is guaranteed, as small changes in the level of the guarantee are expected to impact default rate and recovery rates. Cowling and Mitchell (2003) study the loan guarantee program in the UK. They find that default rates are positively related to interest rates, consistent with the Stiglitz and Weiss (1981) expectation. They also find that default rates are affected by other variables, including the size of the loan, its purpose, the legal form of the borrower, age of the firm, maturity of the loan, and location of the business.

Glennon and Nigro (2005) examine SBA 7(a) loan guarantees in the US. They first compare the default rate of small business loans to other traded debt securities and conclude that the default rate falls between Ba/BB and B rated corporate bonds, as rated by Moody's and S&P. These are below investment grade,

but are of similar default risk as a large number of corporate loans held by banks. They find that newer firms have a higher rate of default than older firms and larger firms have a higher default rate than smaller firms. Higher guarantee percentages were associated with higher default rates. They also found that lenders did not price loans based on risk during the sample period (1983 – 1998).

Doh and Ryu (2004) study loan guarantees among Korean chaebol or borrowing groups. Within the chaebol, there is extensive sharing of information, while between the borrower and lender asymmetric information problems exist. They suggest that the issuance of a loan guarantee by one member on behalf of another in the chaebol is a positive signal regarding the borrower to an outside lender. They further summarize research by Lee and Lee (1998) which indicates that corporate loan guarantees lead to higher debt to equity ratios and suggest that firms within chaebols "over-borrow" because of the availability of these affiliate guarantees. In addition, they suggest that the fees guarantors charge for the guarantees can be viewed as a form of transfer pricing which may lead to distorted incentives. Chakraborty and Hu (2006) study collateral for lines of credit and non-lines of credit. They find that the length of the banking relationship is negatively related to the amount of collateral required, suggesting importance of the durability of the lending relationship.

Brick and Palia (2007) examine the interdependence of interest rates, collateral, and fees using the 1993 Survey of Small Business Finances conducted by the Federal Reserve System for small business lending in the U.S. They found evidence that these variables are jointly or endogenously determined and employ a two-stage least squares (2SLS) procedure to analyze the data. They found a positive correlation among all three variables. Surprisingly, the duration of the banking relationship was not found to be significant, as would be expected for relationship-based lending for small, informationally opaque borrowers. A major contribution of this work is the finding that there appears to be jointness in the way these loan parameters are set, hence, traditional models that ignore these endogenous relationships may produce inaccurate or misleading results. A factor not considered in the Brick and Palia (2007) study nor the Chakraborty and Hu (2006) study was the effect of loan guarantees, which is the focus of this study.

DATA AND METHODOGY

Hypotheses

As mentioned above, loan guarantees can be viewed as reducing the loss given default for the lender, so to the extent that the interest rate reflects anticipated losses, then loans with credit guarantees should have lower interest rates. Since some authors suggest collateral provides a similar function, then collateral also should reduce the interest rate. It can be argued that loan guarantees from other corporate entities or government agencies may add administrative costs and possibly raise the interest rate. However, the premise here is that loan guarantees will reduce the interest rate on lines of credit, all other factors being equal. Secondly, it is expected that the presence of a loan guarantee or collateral would encourage the lender to extend more credit since the bank would expected a larger recovery in the event of default. Unfortunately, one factor not included in the data is whether the loan guarantee covers 100% or some smaller percentage of the total LOC. However, assuming that the loan guarantee provides some protection in the event of default and as suggested by the "over-borrowing" behavior within Korean chaebols lenders should be willing to extend larger amounts of credit.

Therefore, the following two hypotheses are formally tested:

H1: The interest rate charged on lines of credit will be lower in the presence of a loan guarantee and/or collateral.

H2: The size of a line of credit is larger in the presence of a loan guarantee and/or collateral.

Model

There are four endogenous (hypothesis) variables included in this study: the presence of a loan guarantee, loan rate, the size of the LOC, and collateral requirements. These four variables are used to test a number of specific hypotheses relating to the lending process. Control variables are included to capture exogenous effects that have been previously reported in literature, such as, the effect as length of the borrowing relation and specific borrower characteristics including; leverage, cash, fixed assets, ownership structure, number of LOCs outstanding, number of lenders utilized by the borrower, whether the owner is an active manager, and the industry classification based on two-digit SIC codes. Four basic equations will be used to explore this topic. Their general form is shown below.

$$LOCG = \alpha_{11} + \beta_{11}RATE + \beta_{12}LSIZEP + \beta_{13}COLLAT + \beta_{1n}CV + \varepsilon_1 \quad (1)$$

$$RATE = \alpha_{21} + \beta_{21}LOCG + \beta_{22}LSIZEP + \beta_{23}COLLAT + \beta_{2n}CV + \varepsilon_2 \quad (2)$$

$$LSIZEP = \alpha_{31} + \beta_{31}RATE + \beta_{32}LOCG + \beta_{33}COLLAT + \beta_{3n}CV + \varepsilon_3 \quad (3)$$

$$COLLAT = \alpha_{31} + \beta_{31}RATE + \beta_{32}LOCG + \beta_{33}LSIZEP + \beta_{3n}CV + \varepsilon_3 \quad (4)$$

where:

LOCG is binary and indicates the presence of a loan guarantee
RATE is the initial interest rate on the LOC
LSIZEP is the size of the LOC as a proportion of firm assets
COLLAT is binary and indicates the presence of collateral
CV is the vector of control variables (see Table 1 for descriptions)

Note that LOCG COLLAT are dichotomous variables, hence equations (1) and (3) are estimated using a logistic regression procedure. Ordinary least squares regressions will be used for the other two equations. In this study, the existence of simultaneity among the variables was confirmed using the Hausman test before proceeding to use a two stage least squares (2SLS) approach as employed by Brick and Palia (2007). Each of the four hypothesis variables will be regressed on all the exogenous variables in the model. In the second step, the predicted values from these first-stage regressions will be used as independent variables, replacing their respective original variables in the right hand side of equations (1)-(4). Variables not found to be consistently significant in the initial regressions are omitted from the second stage analysis.

Data

The data source is the 2003 Surveys of Small Business Finances (SSBF), available from the US Federal Reserve Board. A total of 4,240 firms and 1,972 variables are included in the survey. The data was collected over several months during the year. For this study, only firms whose most recent loan was a line of credit are included in the analysis. Thus term loans are excluded. Mach and Wolken (2006) report that 34.3% of firms in the 2003 survey have LOCs. The definitions of variables used in this study are provided in Table 1. Variables with missing, extreme, or illogical values (e.g. a negative cash balance) were excluded from the analysis.

Table 2 provides descriptive statistics for the variables used. There are approximately 1,460 observations in the data set. Approximately 63.7% of all LOCs have loan guarantees. The average initial interest rate is 5.55%. The mean term to maturity is just under 31 months. The average size of the LOC scaled by total assets is 66.1%. The average age of the firms in the sample is 17+ years. On average, each borrowers does business with 3.9 lenders. Approximately 80% of the firms have some form of limited

liability, such as, subchapter S, C, or LLC's. Collateral was required in 51% of the loans, while compensating balances were required on less than 9% of the LOCs.

Table 1: Variable Definitions

Dependent Variables	
LOCG	binary variable indicating a guarantee (1 = present)
RATE	nominal initial interest rate charged for line of credit
LSIZEP	dollar value of the line of credit divided by total assets
COLLAT	binary variable indicating collateral (1 = required)
2SLS Instrumental Variables	
LOCG_I	Instrument for LOCG
RATE_I	Instrument for RATE
LSIZEP_I	Instrument for LSIZEP
COLLAT_I	Instrument for COLLAT
Control Variables	
RATEOVRINDEX	initial interest rate premium over index used
FEES	Fees imposed as % of loan
FSIZE	natural log of firm's assets
EMPLOY	number of full-time employees in survey year
LEVERAGE	ratio of debt to total assets
CASH	ratio of cash to total assets
PPE	ratio of net depreciable assets divided by total assets
INC	net income divided by sales
OPINC	operating profit divided by sales
NUMLOC	number of lines of credit for the firm
TERM	term of the line of credit in months
FAGE	age of the firm in years
FIXED	binary variable indicating fixed interest rate (1 = fixed)
DISTANCE	distance in miles between firm and lender
RELATE	length of the firm's relationship with lender in years
LIMLIAB	binary variable indicating limited liability legal form
OWNMGR	binary variable indicating presence of owner/manager
NINST	number of financial institutions used by the firm
GRANTPCT	ratio of amount granted divided by amount requested
Industry	7 dummy variables for two digit SIC code groups (8 total)

For 83% percent of the firms the owner and the manager of the firm are the same individual. Binary variables were used to capture the industry sector based on 2-digit SIC codes. Of the industries represented, 1% were in the mining industry, 8.2% in construction, 15.8% in manufacturing, 4.1% in transportation, 8.6% in wholesale, 16.4% in retail, 42.5% in insurance, and 3.4% in the general services sector. None of the firms had previously filed for bankruptcy and none had been delinquent on previous loans. The preponderance of the LOCs were established during 2003, with only a few exceptions. Small businesses, as defined by the U.S. government, are those having fewer than 500 employees. In the final sample, the average business has 52 employees and assets of $6.2 million.

EMPIRICAL RESULTS

As discusses earlier, there are four dependent endogenous variables of interest: the presence of a loan guarantee (LOCG) and loan collateral (COLLAT), the size of the loan as a proportion of total firm assets (LSIZEP), and the initial interest rate (RATE) on the LOC. Employing a 2SLS approach, Tables 3-6 present the results of the four second-stage regressions where one endogenous variable serves as the dependent variable and three remaining endogenous variables are represented by instrumental variables generated in the three first-stage regressions. (Note that the instrumental variables are identified by the name of the endogenous variable followed by an underscore and the letter "I". For example, the instrument for the collateral variable is indicated by COLLAT_I).

Table 2: Summary Statistics

Variable	N	Mean	Standard Deviation	Minimum	Maximum
LOCG	1460	0.637	0.481	0.0	1.0
RATE	1460	5.548	2.405	0.0	20.9
LSIZEP	1450	0.661	1.404	0.0	12.3
FSIZE	1450	13.445	2.205	7.6	19.1
COLLAT	1460	0.507	0.500	0.0	1.0
LEVERAGE	1450	0.685	1.236	0.0	14.6
FEES	1460	0.007	0.019	0.0	0.2
CASH	1405	0.139	0.211	0.0	1.0
INC	1450	0.038	1.731	-29.0	1.7
TERM	1262	30.99	46.08	0.0	432.0
FAGE	1460	17.171	13.168	1.0	99.0
NINST	1460	3.873	2.023	1.0	13.0
GRANTPCT	1460	1.125	1.016	0.1	12.5
RELATE	1460	76.346	98.031	0.0	600.0
LIMLIAB	1460	0.798	0.402	0.0	1.0
FIXED	1460	0.273	0.445	0.0	1.0
DISTANCE	1460	14.064	76.486	0.0	1110.0
COMPBAL	1460	0.089	0.285	0.0	1.0
EMPLOY	1460	51.772	77.664	1.0	486.0
RATEOVRINDEX	1459	1.203	1.622	-1.5	12.0
PPE	1450	0.324	0.288	0.0	1.0
OWNMGR	1415	0.830	0.375	0.0	1.0
NUMLOC	1460	0.182	0.843	0.0	7.0
MINE	1460	0.010	0.101	0.0	1.0
CONST	1460	0.082	0.275	0.0	1.0
MANUF	1460	0.158	0.364	0.0	1.0
TRANS	1460	0.041	0.199	0.0	1.0
WHOLE	1460	0.086	0.280	0.0	1.0
RETAIL	1460	0.164	0.371	0.0	1.0
INSURE	1460	0.425	0.494	0.0	1.0
Assets	1460	6,243,037	21,430,888	0.0	190,741,345
trading	1460	0.103	0.241	0.0	2.3
liaboverassets	1450	0.996	1.500	0.0	14.7
ROA	1450	0.778	3.359	-6.3	45.6
Quick	1240	18.820	176.485	-41.2	2754.0
cashovrassets	1450	0.131	0.216	-0.7	1.0

Table 2 provides the mean, standard deviation, minimum, and maximum values for each of the variables.

In Table 3, the dependent variable is LOCG. Independent variables include three instruments for collateral, rate, and size. None of the three endogenous instrumental variables are statistically significant. If collateral and loan guarantees serve as substitutes one would expect to see a statistically significant negative coefficient, and if they are complements a statistically significant positive coefficient would be expected. While the coefficient on COLLAT_i is positive it is not statistically significant suggesting the presence of collateral does not impact the probability for a loan guarantee. Thus, the empirical results fail to support the notion that collateral serves as either a close substitute or complement for a loan guarantee. On the other hand, the following factors significantly increase the probably that a loan will have a guarantee: 1) greater use of leverage (LEVERAGE), 2) an increase in the number of lending institutions a borrower utilizes (NINST), greater geographic distance from the lender (DISTANCE), the borrower has

limited liability (LIMLIAB), and the loan carries a compensating balance requirement (COMBAL). Alternatively, the following factors reduce the likelihood of loan guarantees: 1) the larger the firm (FSIZE), the greater the firm's cash balances (CASH), the longer the lending relationship (RELATE), the LOC carries a fixed interest rate (FIXED), and the greater the level of fixed assets owned by the firm (PPE). In terms of prediction accuracy, the logistic regression produced a concordant ratio of 76.5%, a discordant ratio of 23.3% and concordant to discordant ratio of 3.3, with virtually no ties.

Table 3: Logistic Regression (Stage 2) with Collateral as Dependent Variable

Parameter	Expected Sign	Estimate	Wald Chi-Square	Significance
Intercept		1.636	1.426	
COLLAT_I	-	0.457	0.544	
RATE_I	-	0.055	0.211	
LSIZEP_I	+	-0.123	1.033	
FSIZE		-0.223	9.801	***
LEVERAGE		0.480	8.960	***
FEES		4.941	0.605	
CASH		-1.210	4.502	**
INC		0.219	0.298	
TERM		0.003	1.592	
FAGE		0.020	8.639	***
NINST		0.187	16.458	***
GRANTPCT		0.224	5.715	**
RELATE		-0.002	6.768	***
LIMLIAB		1.393	30.310	***
FIXED		-1.233	18.316	***
DISTANCE		0.011	5.430	**
COMPBAL	+	0.572	2.568	*
EMPLOY		-0.004	12.655	***
RATEOVRINDEX		-0.061	0.611	
PPE		-1.136	7.846	***
OWNMGR		-0.050	0.058	
NUMLOC		-0.108	1.038	
Concordant (%)	76.5		Somer's D	0.532
Discordant (%)	23.3		Gamma	0.533
Ties (%)	0.2		Tau - a	0.242
Pairs	226850		c	0.766

*significance denoted by ***, **, * for the 1%, 5%, and 10% level, respectively. This table presents the results of a second stage logistic regression where LOCG (presence of a loan guarantee) is the dependent variable. The estimated equation is:* : $LOCG = \alpha_{11} + \beta_{11}RATE\_I + \beta_{12}LSIZEP\_I + \beta_{13}COLLAT\_I + \beta_{1n}CV + \varepsilon_1$ *Where: RATE_I is the instrument for initial interest rate for the line of credit, LSIZEP_I is the instrument for the size of the line of credit as a proportion of firm assets, COLLAT_I is binary and is the instrument indicating the presence of a collateral requirement, and CV is the vector of control variables.*

In Table 4, COLLAT is regressed on the other three instrumental endogenous variables as well as the remaining independent variables. In this case all three endogenous variables are statistically significant. As mentioned above, in Table 3 the presence of collateral had no impact on the likelihood of the borrower posting a personal guarantee. In contrast, Table 4 indicates that the presence of a loan guarantee (LOCG_I) serves to reduce the likelihood of collateral being pledged against the loan. Thus, while theory would suggest that both collateral and guarantees potentially reduce the loss given default on a loan, and hence, one may substitute for the other, the evidence presented in Table 4 suggest that the relationship is asymmetric. That is, loan guarantees appear to serve as a substitute for collateral but collateral is not a substitute for a personal loan guarantee. As mentioned previously, with a guarantee the borrower is likely pledging his or her personal assets, while with collateral corporate assets are being pledged. Thus, the results suggest that in some sense, guarantees represent a higher form of security than collateral. The coefficient on the loan rate (RATE_I) is also negative suggesting collateral is implicitly priced since the borrower may reduce the loan rate by posting collateral. On the other hand, the size of the loan (LSIZEP) is positively related to the use of collateral suggesting that the lender is attempting to reduce loss given default as the size of the LOC increases. Among the remaining variables the following are positively related to the use of collateral: 1) greater firm profitability (INC), longer the loan maturity (TERM), the greater the age of the firm (FAGE), distance from borrower (DISTANCE), and the use of compensating balances (COMPBAL). The factors which tend to reduce the likelihood of using collateral are: 1) the excess of the loan over the requested loan amount (GRANTPCT), the length of the lending relationship (RELATE), the number of full-time employees (EMPLOY), the level of fixed assets (PPE), and the number of number of lines of credit outstanding (NUMLOC). In terms of accuracy, the percent of

concordant observations is 79.5%, the percent of discordant observations is 20.4%, and a concordant to discordant ratio of 3.9, with virtually no ties.

Table 4: Logistic Regression (Stage 2) with Collateral as Dependent Variable

Parameter	Expected Sign	Estimate	Wald Chi-Square	Significance
Intercept		-0.004	0.000	
LOCG_I	-	-0.950	3.310	*
RATE_I	-	-0.483	17.447	***
LSIZEP_I	+	0.405	10.437	***
FSIZE		0.195	6.598	**
LEVERAGE		0.021	0.063	
FEES		7.578	1.443	
CASH		-0.445	0.668	
INC		1.289	11.714	***
TERM		0.007	8.235	***
FAGE		0.013	3.787	*
NINST		0.063	1.886	
GRANTPCT		-0.352	8.514	***
RELATE		-0.003	9.795	***
LIMLIAB		-0.169	0.330	
FIXED		0.372	1.577	
DISTANCE		0.025	15.021	***
COMPBAL	+	1.121	9.448	***
EMPLOY		-0.003	5.094	**
RATEOVRINDEX		-0.031	0.177	
PPE		-1.332	12.483	***
OWNMGR		-0.224	1.090	
NUMLOC		-0.198	3.283	*

Concordant (%)	79.5	Somer's D	0.591
Discordant (%)	20.4	Gamma	0.591
Ties (%)	0.1	Tau - a	0.292
Pairs	246078	c	0.795

This table presents the results of a second stage logistic regression where COLLAT (indicating presence of a collateral requirement) is the dependent variable. The estimated equation is: $COLLAT = \alpha_{11} + \beta_{11}RATE\_I + \beta_{12}LSIZEP\_I + \beta_{13}LOCG\_I + \beta_{1n}CV + \varepsilon_1$ *Where: RATE_I is the instrument for initial interest rate for the line of credit, LSIZEP_I is the instrument for the size of the line of credit as a proportion of firm assets, LOCG_I is binary and is the instrument indicating the presence of a loan guarantee, and CV is the vector of control variables. Significance denoted by ***, **, * for the 1%, 5%, and 10% level, respectively.*

In Table 5, the loan rate (RATE) is regressed on the other three endogenous variables and the remaining independent variables. Consistent with the asymmetric relationship between loan guarantees and collateral mentioned above, the loan guarantee (LOCG_i) is negatively related to the loan rate while the loan collateral is not. As mentioned earlier the presence of a loan guarantee reduces loss given default (LGD), which is a component in the risk premium a bank incorporates into the loan rate. Firm size (FSIZE) and the loan rate are negatively related suggesting that larger firms have greater bargaining power. Of the remaining explanatory variables the following have a positive and significant relationship with the loan rate: 1) loan fees (FEES), 2) length of the lending relationship (RELATE), fixed interest rate (FIXED), interest rate premium over the market rate index (RATEOVRINDEX), if the manger and owner are the same (OWNMGR), and the number of lending relationships used by the firm (NINST). The following variables are negatively related to the loan rate: 1) firm profitability (INC), 2) length of the loan (TERM), and 3) the total number of full-time employees (EMPLOY). While it may seem surprising that the longer the banking relationship the higher the interest rate, the "hold-up" theory of the lending relationship suggests that banks often attempt to extract economic rents from their long time customers. As the lending relationship matures both the borrower and especially the lender have invested considerable time and effort to develop the relationship. The durability of this relationship reflects a form of "implicit capital" both parties have invested. The lender in particular is interested in maximizing the

return on this investment, and hence attempts to extract economic rents in the form of higher loan rates. The adjusted R-square and F-value for the model are 0.41 and 22.9, respectively.

Table 5: OLS Regression with Interest Rate as Dependent Variable

Variable	Expected Sign	Parameter Estimate	t Value	Significance
Intercept		1410.404	8.82	***
COLLAT_I	-	0.337	0.8	
LOCG_I	-	-0.872	-2.46	**
LSIZEP_I	?	-0.063	-0.82	
FSIZE		-0.263	-5.13	***
LEVERAGE		-0.031	-0.54	
FEES		27.141	7.39	***
CASH		-0.149	-0.38	
INC		-0.577	-2.14	**
TERM		-0.004	-2.81	***
FAGE		-0.006	-1.42	
RELATE		0.002	2.89	***
LIMLIAB		-0.256	-1.24	
FIXED		1.501	8.72	***
DISTANCE		-0.002	-1.56	
COMPBAL	?	0.262	1.1	
EMPLOY		-0.002	-2.52	**
RATEOVRINDEX		0.341	7.02	***
PPE		0.321	1.19	
OWNMGR		0.319	2.15	**
NUMLOC		-0.017	-0.22	
NINST		0.138	4.32	***
GRANTPCT		0.052	0.81	
Adj. R-squared		0.41		
F statistic		22.86		***

*This table presents the results of a second least squares (2SLS) regression where RATE (initial interest rate). The estimated equation is: : RATE = $\alpha_{11} + \beta_{11}LOCG\_I + \beta_{12}LSIZEP\_I + \beta_{13}COLLAT\_I + \beta_{1n}CV + \varepsilon_1$ Where: LOCG_I is the instrument for the presence of a loan guarantee, LSIZEP_I is the instrument for the size of the line of credit as a proportion of firm assets, COLLAT_I is binary and is the instrument indicating the presence of a collateral requirement, and CV is the vector of control variables. Significance denoted by ***, **, * for the 1%, 5%, and 10% level, respectively.*

In Table 6, loan size as a percent of total firm assets (LSIZEP) is regressed on the other three endogenous variables. Both loan guarantee (LOCG_I) and loan rate (RATE_I) are negatively related to loan size. This may be explained by the fact that small borrowers requesting smaller loans are less diversified and hence potentially riskier, leading to both higher interest rates and a greater use of personal loan guarantees. Once again, it appears that there is an asymmetric relationship between loan guarantees and collateral, with guarantee having the stronger impact (Note that the coefficient collateral is negative but not statistically significant). Among the other explanatory variables the following have a positive relationship with loan size: 1) firm leverage (LEVERAGE), 2) loan fees (FEES), 3) firm profitability (INC), 4) limited liability (LIMLIAB), 5) number of employees (EMPLOY), and 6) the number of lending relationships (NINST). Among the explanatory variables with a negative relationship with loan size are: 1) the length of the lending relationship (RELATE), and 2) and the interest rate premium over the market rate index (RATEOVRINDEX). Once again there is evidence of a "hold-up" effect as demonstrated by the negative relationship between loan size and the durability of the lending relationship. One way for the lender to extract economic rents from the relationship is to make not only higher priced loans but to reduce the size of the loan. This limits the lenders risk at the expense of the borrowers financing needs. The adjusted R-square and F-value for the model are 0.32 and 17.2, respectively.

Hypothesis H1 indicates that loan guarantees lower the interest rate charged. The results indicate that the presence of a loan guarantee is in fact associated with a lower rate of interest, however, when loan guarantee is the dependent variable, the loan rate is not significant. The follow-on statement in H1states that collateral lowers the interest rate is weakly supported. The presence of collateral does not

significantly affect the interest rate when the loan rate is the dependent variable. However, higher interest rates are associated with a lower likelihood of collateral use when collateral is the dependent variable.

Hypothesis H2, which states that lines of credit will be larger in the presence of a loan guarantee can be rejected. The coefficient on loan guarantees (LOCG_I) is negative and statistically significant where loan size is the dependent variable. In this case, loan guarantees appear to be associated with smaller, perhaps riskier loans. Consistent with this explanation, loan guarantees are associated with higher leverage. In a related fashion, hypothesis H2 also states that lines of credit will be larger when collateral is required. The insignificant empirical results suggest that the presence of collateral does not explain the size of the loan when loan size is the dependent variable. However, larger loans increase the probability that collateral will be required when COLLAT is the dependent variable. Consistent with Chakraborty and Hu (2006), the length of the banking relationship is significant is all the regressions. A longer relationship is associated with a lower probability of both a loan guarantee and collateral requirements, but is associated with higher interest rates and smaller lines of credit, which may indicate that banks are trying to earn economic rents from their long-term borrowers. However, the estimates suggest the practical effect is minimal as the coefficients are all quite small.

Table 6: OLS Regression with Loan Size as the Dependent Variable

Variable	Expected Sign	Parameter Estimate	t Value	Significance
Intercept		4.965	9.14	***
COLLAT_I	+	-0.341	-1.43	
LOCG_I	+	-0.815	-3.96	***
RATE_I	?	-0.182	-3.84	***
FSIZE		-0.270	-9.27	***
LEVERAGE		0.305	9.86	***
FEES		10.543	4.1	***
CASH		-0.232	-0.99	
INC		0.384	2.44	**
TERM		-0.001	-0.58	
FAGE		0.002	0.79	
RELATE		-0.001	-2.94	***
LIMLIAB		0.576	4.71	***
FIXED		-0.230	-1.82	*
DISTANCE		0.002	1.93	
COMPBAL	?	0.083	0.59	
EMPLOY		0.001	2.67	***
RATEOVRINDEX		-0.064	-2.01	**
PPE		-0.024	-0.15	
OWNMGR		-0.070	-0.81	
NUMLOC		-0.009	-0.2	
NINST		0.034	1.78	*
GRANTPCT		0.036	0.95	
Adj. R-squared		0.32		
F statistic		17.2		***

This table presents the results of a second least squares (2SLS) regression where LSIZEP (size of line of credit over assets). The estimated equation is: $LSIZEP = \alpha_{11} + \beta_{11}LOCG\_I + \beta_{12}RATE\_I + \beta_{13}COLLAT\_I + \beta_{1n}CV + \varepsilon_1$ *Where: LOCG_I is the instrument for the presence of a loan guarantee, RATE_I is the instrument for the initial interest rate for the line of credit, COLLAT_I is binary and is the instrument indicating the presence of a collateral requirement, and CV is the vector of control variables. Significance denoted by ***, **, * for the 1%, 5%, and 10% level, respectively*

Furthermore, loan guarantees appear to be used more frequently by limited liability firms and are also used more frequently by more highly leveraged firms. On the other hand, longer banking relationships are associated with less frequent use of guarantees. The interest rate and size of the line of credit offer no significant explanation for the presence of a loan guarantee. The use of collateral also does not explain the use of loan guarantees. The interest rate charged is lower in the presence of a loan guarantee, but is not significantly affected by the use of collateral or compensating balances. Loan guarantees are associated with smaller loans, possibly an indication of lower credit quality. It appears that lower credit

quality is addressed though the use of loan guarantees and by limiting the size of lines of credit granted.. In this case, loan size and guarantees appear to be complementary. This provides evidence that credit rationing is taking place

CONCLUSION

In our research, loan guarantees are found to have a negative effect on the size of loans and also a negative effect on the interest rate of the loans. There is some evidence that loan guarantees and collateral are asymmetric substitutes as the presence of a loan guarantee lowers the likelihood of a collateral requirement but the opposite is not true. Collateral does not appear to be substitute for land guarantees. Furthermore, measures of liquidity and leverage affect the use of loan guarantees, while they do not significantly affect the use of collateral. The presence of more fixed assets lowers the likelihood of both loan guarantees and collateral. Both loan guarantees and collateral are explained, in part, by the ratio of the amount of credit granted to that applied for. However, the signs are different, so loan guarantees are more probable as the loan amount increases while collateral requirement are less likely. Perhaps this is once again a reflection that the two are substitutes. The variable GRANTPCT suggest that there is more room to bargain with collateral requirements and loan guarantees than interest rates or the final size of the line of credit.

As reported by Brick & Palia (2007), there is some evidence of simultaneity among the terms of lending which if not accounted for may provide inconsistent results. Brick & Palia (2007) and others examine the effects of the strength of the lending relationships on the terms of lending. Various authors have found little or no significant effect. In this research, the length of the lending relationship is considered a proxy for the strength of the relationship. Furthermore, the model includes an additional variable, which reflects the number of lending relationships a firm relies upon. If both variables measure an important aspect of the lending relationship, their signs should be opposite. Holding all else constant, a longer relationship is presumed to indicate a stronger relationship, while a greater number of lending relationships might suggest a weaker relationship. The empirical evidence suggests that multiple banking relationships do in fact reflect a weaker lending relationship. Furthermore, for loan guarantees a longer (stronger) lending relationship is associated with a lower probability of a guarantee. For collateral, only the length of the relationship is significant, but it too indicates that a longer relationship is associated with a lower probability of collateral. In the case of the loan rate, the two variables have the same sign, while in the loan size equation a stronger relationship is associated with smaller loans, contrary to what might be expected. As mention in the beginning, the precise terms of any given loan reflect the results a complex set of negotiation between the borrower and the lender where various trade-off exist between the individual terms of lending.

REFERENCES

Brick, I. and Palia, D. (2007). Evidence of Jointness in the terms of relationship lending. *Journal of Financial Intermediation*. 16, 452 – 476.

Camino, D., and Cardone, C. (1999). The Valuation and Cost of Credit Insurance Schemes for SME: The Role of Loan Guarantees. *International Small Business Journal*, 17, 13–31.

Chakraborty, A. and Hu, C. (2006). Lending relationships in line-of-credit and non-line-of-credit loans; Evidence from collateral use in small business. *Journal of Financial Intermediation*, 15, 86 – 107.

Cowling, M., and Mitchell, P. (2003). Is the Small Firms Loan Guarantee Scheme Hazardous for Banks or Helpful to Small Business. *Small Business Economics*, 21, 63-72.

Doh, T., and Ryu, K. (2004). Analysis of Loan Guarantees among the Korean Chaebol Affiliates. International Economic Journal, 18, 161 –178.

Glennon, D. and Nigro, P. (2005) Measuring the Default Risk of Small Business Loans: A Survival Analysis Approach. *Journal of Money, Credit & Banking*, 37, 923-947.

Mach, T. and Wolken,J. (2003). Financial Services Used by Small Businesses: Evidence from The 2003 Survey of Small Business Finances. Federal Reserve Bulletin, 92, A167-195.

Petersen, M., and Rajan, R. (1994). The Benefits of Lending Relationships: Evidence from Small Business Data. *Journal of Finance*, 49, 3-37

Riding, A. and Haines Jr., G.(2001). Loan Guarantees: Cost of Default and Benefits to Small Firms. *Journal of Business Venturing*, 16, 595 – 613.

Stiglitz, J. and Weiss,A. (1981). Credit Rationing in Markets with Imperfect Information. *American Economic Review*, 71 Issue, 393 – 411.

BIOGRAPHY

Dr. Alan K. Reichert is a Professor of Finance at Cleveland State University. He can be contacted at Department of Finance, College of Business, Cleveland State University, 2121 Euclid Avenue, Cleveland, Ohio 44115. Email: a.reichert@csuohio.edu

Dr. Ray Posey is Department Chair and Professor of Business Administration, Mount Union College. He can be contacted at Department of Business Administration , Mount Union, Ohio, Alliance, Ohio 44601. Email: Poseyra@muc.edu