THE INCIDENCE OF PERSONAL COLLATERAL IN SMALL BUSINESS LENDING.

Tensie Steijvers
Limburgs Universitair Centrum
Department of Business Administration
Universitaire Campus, B-3590 Diepenbeek, BELGIUM
Tel. +32 11 268658, Fax +32 11 268700
E-mail: tensie.steijvers@luc.ac.be

Wim Voordeckers
Limburgs Universitair Centrum
Department of Business Administration
Universitaire Campus, B-3590 Diepenbeek, BELGIUM
Tel. +32 11 268694, Fax +32 11 268700
E-mail: wim.voordeckers@luc.ac.be

ABSTRACT

Previous empirical research has devoted little effort on the role and determinants of business collateral and personal commitments in the credit acquisition process, even though this is a common feature of many small business credit contracts. This paper provides new empirical evidence on the determinants of business collateral and personal commitments. Starting from theoretically important factors concerning the use of collateral, a multinomial logit model is used to determine simultaneously the determinants of both kinds of commitments. The results, based on a database of small business credit approvals from a Belgian retail bank, suggest that loan, lender and firm characteristics are of minor importance. Only firm size, profitability, industry, use of trade credit and the organization as a family firm seem to matter. On the other hand, variables concerning the relationship between lender and borrower seem to be of major importance.

INTRODUCTION

Previous studies concerning the functioning of the credit market have mainly focused on the role of the intrest rate of credit even though other features of credit contracts seem to be very important as well (Coco 2000). The pledging of collateral to secure loans is a widespread, important feature of the credit acquisition process (Berger and Udell 1990, Leeth and Scott 1989).

A common feature of many small business credit contracts is the use of personal commitments[1] (Avery et al 1998). This feature implies that there is little separation of business and personal risks associated with small business ownership. Furthermore, Avery et al (1998) argue that personal wealth of small business owners will play a key role in the credit acquisition process if personal commitments are a fundamental condition to obtain a credit.

Despite the considerable amount of effort that has been devoted in the theoretical literature to the role of collateral in business lending, astonishingly little empirical evidence is available concerning the determinants of personal collateral in small business lending. The only available empirical studies we are aware off (Ang et al 1995, Avery et al 1998), are based on U.S. data. No European data based study was found concerning the determinants of both kinds of collateral. In this paper, we will try to fill the gap in this domain of the empirical literature concerning secured debt. We will identify from the theoretical literature the factors that determine the use of personal commitments and test them empirically simultaneous with the determinants of business collateral. A multinomial logit model will be used to estimate the econometric model. We will differentiate between three kinds of credit: (1) unsecured debt, (2) secured debt with only business collateral and (3) secured debt with personal commitments. In order to test the hypotheses, we will use a database from a Belgian retail bank. This analysis will allow us to complete our understanding of the total risks faced by owners of SME's. In case of abundant use of personal commitments, the risks for the SME owner may extend beyond business failure and could even result in personal ruin (Ang et al 1995).

---

[1] Personal commitments are defined as both personal collateral and guarantees that make owners personally liable for business debt (Avery et al 1998).

The organization of the paper is as follows. Section 2 reviews and discusses the secured debt literature. In section 3 the hypotheses are developed. Section 3 explains the empirical methodology and the variables. The results are analysed in section 4. Section 5 concludes the paper.

THE SECURED DEBT LITERATURE

Throughout the years, several theoretical contributions attempting to explain the widespread use of collateral have been developed (e.g. Chan and Kanatas 1985, Scott 1977, 1979, Smith and Warner 1979a, 1979b, Stulz and Johnson 1985). From the point of view of a value-maximizing firm, collateral would impose costs and create benefits for both lenders and borrowers that influence the value of the firm.

The *costs* of collateral could be extensive. Lenders must value and monitor collateral, pay filing fees for security registration and incur administrative expenses. Borrowers have to make additional reports to financial institutions and agree with more restrictive asset usage. In addition, both parties have to resolve the conflicts of interest between secured and unsecured claimants created through the use of collateral (Leeth and Scott 1989, Mann 1997a, 1997b).

Besides these costs, the *benefits* include the reduction of agency costs, limitation of possible legal claims, reducing informational asymmetries and refraining from excessive future borrowing. First of all, the reduction of *agency costs* by pledging collateral may lower the cost of debt by preventing the problem of asset substitution (Jensen and Meckling 1976) and mitigating the underinvestment problem (Myers 1977). The asset substitution problem arises when a borrowing firm has the possibility to switch to higher risk investment projects than the original intended projects. The potential profit gains of this behaviour in case of success are entirely for the borrowing firm. On the other side, creditors receive no additional gain in case of success but bear the potential losses in case of project failure. The underinvestment problem (Myers 1977) originates where investment projects with a low positive net present value and low risk are rejected because only unsecured debt financing is available. In this case, collateral can play its role in reducing future bankruptcy costs

and as a consequence, mitigates the wealth transfer from shareholders to unsecured creditors.

Secondly, secured debt also *limits possible claims* in bankruptcy and as a consequence creates shareholder wealth (Scott 1977). In liquidation, pledged collateral allocates resources away from unsecured to secured creditors. Under conditions of perfect information, security protection lowers the interest rate of secured creditors but increases proportionally the implicit interest rate of unsecured creditors. If, due to incomplete information, some unsecured creditors do not react to this decrease in legal protection, then firms can expropriate wealth from these unsecured claimants by offering collateral to lenders (Leeth and Scott 1989).

Thirdly, as far as the minimisation of the *information asymmetry* between borrower and lender is concerned, the borrower receives, in exchange for collateral, the advantage of a lower interest rate but incurs the risk of loosing collateral when the return of the project turns out to be too low (Chan and Kanatas 1985, Bester 1985, Besanko and Thakor 1987a, 1987b, Chan and Thakor 1987). When the borrower considers the chance of a low return as too large, the costs associated with collateral exceed the advantages of a lower interest rate. As a consequence, the borrower will refuse the loan. The reverse is true when it concerns a project with a high probability of a high return. Thus, collateral serves to convey indirectly information between the two parties. Collateral has a 'signalling role' by showing the real value of a project. This certainly is the case when the financial institution assigns a lower value to the project due to limited information availability. Much of the theoretical literature concludes that, in equilibrium, low risk borrowers pledge more collateral than high risk borrowers. However, Stiglitz and Weiss (1981) show that collateral may introduce an adverse selection problem that associates higher levels of collateral with higher average borrower risk.

Finally, another benefit of secured credit is, according to Mann (1997a, 1997b), the fact that securing credit limits the firms' ability to obtain future loans from other lenders or reduces the risk of *excessive future borrowing*.

In general, one can conclude that, given the idea that moral hazard is the most important problem in financial relationships, collateral plays a disciplinary role in the behaviour of the borrower. As a consequence, stronger creditor protection from collateral leads to cheaper credit. Recently, Manove et al. (2001) criticized the unrestricted reliance on collateral and argued that this might have a negative impact on credit-market efficiency. They argue that banks are in a good position to evaluate the future prospects of new investment projects. Collateral will weaken the bank's incentives to do so. Especially for small firms, banks seem to do little screening and rely excessively on collateral. From the point of view of banks, collateral and screening can be considered as substitutes.

The majority of these theoretical contributions consider 'secured' debt but do not make the explicit distinction between personal and business collateral. The few theoretical studies (e.g. Chan and Kanatas 1985) that make the distinction conclude that business and personal collateral are very similar. Nevertheless, Mann (1997b) argues that personal collateral is more effective in limiting the borrower's risk preference incentives by enhancing the likelihood that the principal will feel any losses personally. The empirical literature (Leeth and Scott 1989, Ang et al. 1995, Avery et al 1998, Hanley 2002) concerning the determinants of collateral is scant, possibly due to data limitations. While it is well documented that small and medium-sized firms rely primarily on financial intermediaries as lenders, especially commercial banks (Cole et al 1996), only partial clues exist as to the role of personal wealth or business wealth in the contractual details of lending arrangements. In previous research, Berger and Udell (1988, 1995) find a positive relationship between pledging collateral and firm risk. Moreover, empirical studies by Ang et al (1995) and Avery et al (1998) found that personal commitments are an important component of small business lending. However, in general little has been done to refine such results by distinguishing the factors related to personal versus business collateral usage.

In their research, Ang et al (1995) examine whether the factors related to business collateral are also related to personal commitments. They state that larger firms, both sole proprietorships and corporations, have a greater degree of separation between business and personal risks and thus lower personal commitments. Smaller firms would be more dependent on personal collateral. In addition, their results reveal that

firms with lower leverage ratios have a lower incidence of personal commitments while firms with lower profitability offer more personal collateral. They conclude that personal risks are substantial for all organizational forms and should be included when examining business risks. Avery et al (1998) build on the paper of Ang et al (1995) even though they examine a wider range of factors including owner, loan and lender characteristics that potentially affect the use of personal commitments. In addition, they address collateral pledges and guarantees separately throughout the empirical analysis and examine the extent to which they serve as substitute credit enhancements for small firms. One of the most appealing results concerns the strong evidence that personal commitments are substitutes for business collateral, at least for lines of credit, while personal collateral and guarantees appear to be complementary.

HYPOTHESES DEVELOPMENT

Firm Characteristics

Firm size is expected to be negatively related to collateral usage. Several explanations for this expected relationship could be found. Chan and Kanatas (1985) argue that newer and smaller firms will offer more collateral in order to signal project quality when lenders have less information concerning a company's operations. According to Altman et al (1977), debt expenses for small firms may be reduced to a larger extent by collateral because of their higher probability of bankruptcy. Unfortunately, none of these studies differentiate between business collateral, personal collateral and guarantees. However, more recent studies by Ang et al (1995) and Avery et al (1998) make the distinction. Avery et al (1998) argue that firm size is expected to be negatively related to the costs incurred by lenders, in part because larger firms are likely to be owner of more business assets that can be pledged as business collateral than smaller firms. In this case, business assets may be sufficient security for creditors while lenders expect similar levels of personal commitments from smaller firms. Therefore, one could expect that larger firms use less personal commitments than smaller firms. Moreover, size can be considered as a proxy for prior success, resulting in lower requirements for personal commitments by lenders to obtain a business loan (Ang et al 1995).

H1a: Firm size is negatively related to the likelihood of collateral usage.
H1b: In case of collateral pledging, larger firms have a lower likelihood of personal commitment usage.

A second firm characteristic that could have an influence on the use of personal commitments is the difference between *family* and *non-family firms*. Personal commitments could bring about potential agency problems between individual partners in small firms due to unequal risk sharing and free-riding among the partners. When all partners pledge personal collateral or guarantees, the actions of one partner can place the wealth and personal assets of all other partners at risk (Ang et al 1995). This potential agency problem is expected to be more prevalent in non-family firms. We therefore postulate the hypothesis:

H2: Non-family firms have a lower likelihood to use personal commitments than family firms.

An important element in the determination of collateral value is *asset specificity*. Highly specialized assets have almost no alternative usage, resulting in a low liquidation value. Leeth and Scott (1989) argue that asset specificity lowers the value of bonding against asset substitution behaviour. Theories predict that firms with more specialized assets offer less frequently business collateral than other companies. Nevertheless, personal commitments can take over the role of bonding mechanism against asset substitution behaviour in the absence of significant business collateral.

The presence or absence of significant business collateral is related to the firm industry. The primary assets for the majority of service-based firms are intangible in nature and as a consequence, have low or no liquidation value. For these firms, personal commitments may even be critical in obtaining financing (Avery et al. 1998). Therefore we expect a positive relation between asset specificity and the pledging of personal commitments.

H3: Higher asset specificity will increase the likelihood of personal commitment usage.

Trade credit could be used as a signalling instrument, mitigating the adverse selection problem. Biais and Gollier (1997) show in their model that trade credit can play an important role in the credit decision process of banks when suppliers have private information about their customers. Providing trade credit is a credible way for sellers to convey their private information about the company to the bank. When the signalling effect of trade credit is strong enough, it is expected to reduce the likelihood that firms have to pledge collateral. Therefore we formulate the following hypothesis:

H4a: More trade credit decreases the likelihood of pledging collateral.
H4b: In case of collateral pledging, firms that use more trade credit have a lower likelihood of personal commitment usage.

The *financial characteristics* of a company also influence the incidence of secured debt (Mann 1997a). Empirical findings indicate that if a borrower's financial strength increases ceteris paribus, the incidence of secured credit diminishes (Scott and Smith 1986, Berger and Udell 1988, 1992, Klapper 2001). Berger and Udell (1988) define this as the 'sorting by observed risk paradigm'. These empirical findings are due to a decrease of the benefits and a status quo of the costs associated with secured debt. As already mentioned, pledging collateral involves a reduction in the ex ante expectation of default. Of course, when financially strong companies would provide their creditors with collateral, this would imply just a minor reduction in risk because the perceived risk by the lender is already very limited. The fact that mainly financially strong firms obtain loans without providing collateral because of the safety of the loans is confirmed by earlier empirical research. Berger and Udell (1988) and Booth (1992) suggest that these unsecured loans have lower risk premiums and fewer defaults than loans with collateral. On the other hand, the costs (e.g. costs of enduring supervision by the lender, costs of valuation and monitoring, filing fees, administrative expenses, agency costs) remain more or less status quo (Leeth and Scott 1989).

In contrast to the empirical literature and actual practice cited above, signalling theory predicts the opposite (Bester 1985, Chan and Kanatas 1985, Besanko and Thakor 1987a, 1987b, Chan and Thakor 1987). It states that the financially strongest companies will be more willing to offer collateral as a way of signalling their strength

and low risk of failure of payment. Collateral serves as a mean to overcome the asymmetric information problem often coped with by small firms. Berger and Udell (1988) define this as the 'sorting by private information paradigm'.

Manove et al (2001) try to reconcile theory with empirical findings, by arguing that low-quality entrepreneurs are screened, while high-quality entrepreneurs are not. As a consequence, for low-quality entrepreneurs only good projects are funded while for high-quality entrepreneurs all projects are funded, including some bad projects. Thus, if firms' ex post performance has been used to divide them into low and high-risk classes, we would conclude that high-risk borrowers more often post collateral, being actually the high-quality unscreened entrepreneurs.

H5: Financially strong companies have a greater tendency towards secured debt.

Relationship Characteristics

Relationship banking stresses the fact that banks can improve their revenues by maximising the profitability of the actual relationship with the firm throughout time. So far, research on relationship lending mainly concerns the effect of a strong relationship on the interest rate. Links between relationship strength and collateral have not received much attention in literature (Coco 2000).

A relationship can be defined in numerous ways. The most common measure is the *duration* of the relationship with the bank (Petersen and Rajan 1994, 1995, Berger and Udell 1995, Angelini et al 1998, Ongena and Smith 2001). Previous scant empirical research focusing on the link with collateral has stressed this duration of the relationship and has discovered that firms with a longer relationship with their bank incur a lower incidence of collateral (Berger and Udell 1995, Harhoff and Körting 1998). This is theoretically predicted by the model of Boot and Thakor (1994). The capacities and the character of the entrepreneur become obvious as the relationship continues. Also the timely repayment of acquired loans contributes to the reliability of the firm. The entrepreneur gets the opportunity to build a good reputation and give a signal of trustworthiness. As time goes by, the entrepreneur builds up a good reputation and the moral hazard problem will diminish (Diamond 1989). A good

reputation is considered a valuable asset. Consequently, the firm will prefer a low-risk project above a high-risk project, reducing the probability of repayment difficulties and keeping the value of the reputation asset intact. Petersen and Rajan (1994) argue that the reputation effect does not necessarily have to depend on the duration of the relationship. When a creditor can acquire information concerning the firm via interactions of this firm with their previous financial institution, the age of the firm can count as relationship measure. So a good relationship can solve the adverse selection and moral hazard problem as it offers the possibility for the bank to get properly acquainted with the firm and can reduce the information asymmetry between financial institutions and firms.

H6a: Firms with longer relationships with the bank, from which they obtain a loan, have a lower likelihood of pledging collateral.
H6b: In case of collateral pledging, firms with a longer relationship with the bank have a lower likelihood of personal commitment usage.

Instead of the duration of the relationship, we can also use an alternative measure for the strength of the relationship used in previous empirical research, being the *exclusivity* of the relationship (Petersen and Rajan 1994, Ferri and Messori 2000, Berger et al. 2001, Ongena and Smith 2001). If a financial institution operates as the main banker for a firm, the firm mostly communicates with this particular bank. Obviously, this intense communication between both parties reduces the banks' risk involved in granting credit. It diminishes the information asymmetry and improves the banks' knowledge of the firm.

H7a: A more exclusive relationship reduces the likelihood of pledging collateral.
H7b: In case of collateral pledging, a more exclusive relationship with the bank decreases the likelihood of personal commitment usage.

Additionally, we can also categorize the number of banks a firm negociates with before agreeing to a certain credit contract under the relationship header. A firm, which does not exclusively deal with one bank, can introduce competitive forces in the credit acquisition process. The threat for a financial institution of loosing a certain

firm as borrower to a competitor can imply that this financial institution will diminish its initial demand concerning the pledging of collateral.

H8a: Increasing the use of competitive forces between banks during the credit request process decreases the likelihood of pledging collateral.

H8b: In case of collateral pledging, the use of competitive forces increases the likelihood of pledging business collateral instead of using personal commitments.

Loan Characteristics

The *time to maturity* or loan duration has an impact on the incidence of secured debt: long-term credit would be more often secured due to several reasons. First of all, long-term loans require a long-term judgement of the creditor on the creditworthiness of the debtor. A company that is financially strong and creditworthy at the moment of a credit acquisition cannot assure that it will remain creditworthy in the future. The chance of occurrence of an adverse event becomes larger, as the time period of the loan is enlarged. Collateral has the power to decrease the ex ante loan assessment of risk. The pledging of collateral is an effective mechanism for the creditor to ascertain himself of a certain value in the future: a company may not retain its value on a longer term but collateral does most likely retain its value (Mann 1997a).

Secondly, the problem of asset substitution is particularly present when providing long-term credit (Jackson and Kronman 1979). The term of the loan gives the debtor enough opportunity to alter the projects in subtle ways or even switch from low-risk to high-risk projects. As loan duration falls, the reputation effect becomes much more important.

Thirdly, for firms, which have acquired short-term credit and would actually engage in asset substitution, the wealth transfer would be relatively small compared to the reputation cost (higher future interest rates). Moreover, the speed required to substitute assets would raise costs for the debtor. Consequently, short-term loans will rely less on collateral provision (Schwartz 1981, Leeth and Scott 1989). In contrast, Stulz and Johnson (1985) argue the opposite. They assert that the value of collateral is a decreasing function of time to maturity. Consistent with the majority of the

theoretical literature and the empirical research by Leeth and Scott (1989), we postulate the next hypothesis:

H9: Long-term creditors are more likely to rely on the pledging of collateral.

From both a theoretical and empirical point of view, *loan size* would have a positive impact on the provision of collateral by a firm. The advantages of loans backed by collateral set forward in a previous section (e.g. preventing asset substitution, claim dilution, reducing foreclosure costs), have to be more extensive than the costs that are mainly fixed. For small loans, these benefits cited may not cover the fixed costs including monitoring costs, costs for asset appraisals and administrative expenses. Given these arguments, Jackson and Kronman (1979) conclude that larger loans should be more frequently secured. Loan size is also linked to the probability of default, since a firm that receives more credit attains a higher leverage level and so increases the risk of non payment (Leeth and Scott 1989, Avery et al 1998).

H10: Loans of a larger size are more often provided on a secured basis.

Lender Characteristics

Screening efforts of banks could have an influence on the pledging of collateral. In case of small business lending, banks usually have superior expertise in judging the different aspects of project quality in comparison to the often-unrealistic optimistic entrepreneur (De Meza and Southey 1996). Although the disciplining role of collateral to prevent moral hazard by borrowers is well described in literature, collateral also has a potential drawback. Manova et al. (2001) prove that collateral protection may induce banks to be "lazy" and reduces their screening efforts below socially efficient screening levels. As a result from the point of view of banks, collateral and screening can be considered as substitutes.

H11: Lower screening efforts of the bank increase the likelihood of pledging collateral.

EMPIRICAL METHODOLOGY

Sample

This research project utilizes credit file data of a large Belgian bank. In order to construct the database, we used a questionnaire, which was filled out by the account manager of each credit file. The questionnaire contained questions concerning the set of variables needed to test the hypotheses. We obtained a database containing a sample of 210 random selected small business credit requests during the period 1999-2002. After removing outliers, we ended up with a final sample of 201 cases.

Variables

Dependent variables.
The dependent variable was treated as a categorical dummy variable with three levels. The first category are credit requests approved without any collateral (28 cases). The second category are credit requests approved with only business collateral (107 cases). The third category are credit requests approved with personal commitments (66 cases).

Independent variables.
Firm characteristics include the size of the company (LNTA), which is measured by the natural log of total assets. The distinction between family and non-family firms is measured by a dummy variable (FAMILY) coded "1" if the company is a family firm and "0" otherwise. The influence of trade credit on collateral is tested with the proxy trade credit scaled by total assets (TRADECR). The financial strength of the company at the moment of the credit request is measured by two financial variables: equity scaled by total assets (EQUITY) and return on equity (ROE). Loan characteristics variables include the time to maturity of the loan in months (MATURITY), the natural log of loan amount in € (LNAMOUNT), and the number of days needed by the bank to judge the credit request (LAZY) in order to test the 'lazy banks' hypothesis. In order to test the asset specificity hypothesis, we use industry as proxy. Industry (INDUSTRY) is treated as a series of categorical dummy variables with four categories (manufacturing, building, retail and wholesale, service).

Table 1 Summary statistics

Variable	Mean	Standard deviation
TRADECR	0.291	0.179
EQUITY	26.745	15.453
ROE	9.462	20.055
RELATION	10.955	8.157
COMPETI	0.562	0.858
MATURITY	35.034	30.347
AMOUNT	204634	503900
LAZY	12.298	16.756
FIRMAGE	156.975	113.409
TA	3582.437	6750.498

In order to test the strength of the relationship the number of years of the relationship is included (RELATION) as a first variable. Furthermore, we included in the model the number of competing banks for the same credit request (COMPETI) and a dummy variable coded "1" if the bank is the 'main bank' and "0" otherwise (BANKER). Summary statistics of the main independent variables in the model are reported in table 1.

Control variables

We control in our study for four variables: firm age, mother-daughter position, the year of approval and the kind of the asset financed. Firm age (FIRMAGE) is measured by the age of the firm in months. The position in a group of companies can influence the credit decision. Therefore we included a dummy variable (MOTHDAU) coded "1" if the company is the mother and "0" if it concerns a daughter company. The year of approval (APPROV) is treated as a set of categorical dummy variables consisting of the three years (2000, 2001, 2002) in which the loan requests have been approved. The kind of the asset that has to be financed (CHARACT) is measured as a categorical dummy variable with three categories: (1) real estate and machinery, (2) vehicles and (3) other assets.

Estimation method

The relation between pledged collateral and the independent variables is examined in a multiple-choice setting with three alternatives. Therefore a multinomial logit model is used (Maddala 1987). The regression model can be written in the form:

$$\ln (P_{no}/P_{per}) = \beta_1 + \beta_{11}X_1 + \beta_{12}X_2 + \beta_{13}X_3 + ... + \beta_{1n}X_n \qquad (1)$$

$$\ln (P_{bus}/P_{per}) = \beta_2 + \beta_{21}X_1 + \beta_{22}X_2 + \beta_{23}X_3 + ... + \beta_{2n}X_n \qquad (2)$$

where 'no' = 'no collateral', 'bus' = 'business collateral' and 'per' = 'personal commitment'. The independent variables X_1 through X_n have been described in the previous section. The third comparison between 'no collateral' and 'personal commitment' can be derived from equations (1) and (2) since:

$$\ln (P_{no}/P_{bus}) = \ln (P_{no}/P_{per}) - \ln (P_{bus}/P_{per}) \qquad (3)$$

RESULTS

In table 2, we present the results from the regressions on our sample. The χ^2 value indicates that the econometric model is statistical significant at the 1% level.

Our results indicate that, contrary to what was hypothesized, the *size of the firm* has a significant effect on the probability of pledging any kind of collateral: larger firms are less likely to acquire credit without pledging collateral. This surprising result can be explained by the fact that in our database, credit was often acquired without pledging 'additional' collateral. This means that companies which have granted personal or business collateral in previous years of operation, nowadays cannot get any additional credit, when withdrawing their personal commitments or business assets. The occurrence of many loans being granted "within the existing collateral" can be evidence of the fact that small firms often pledge more collateral than is necessary during the early years.

The variable '*family firms*' seems to have a significant positive effect on the probability of granting (business or personal) collateral. Moreover, family firms are, as hypothesized, more likely to use personal commitments as compared to business collateral. The results also point out that the variable '*industry*' has a certain effect in collateral usage but not in the way it was hypothesized. The sector "retail & wholesale" is less likely than the manufacturing industry to use personal commitments as compared to the other two dependent variable categories. Contrary to our expectations, no significant effect was found for the "service" sector.

Table 2 Multinomial logit estimation of the determinants of collateral pledging.

Independent variables	Dependent variable		
	$\ln (P_{no}/P_{per})$	$\ln (P_{bus}/P_{per})$	$\ln (P_{no}/P_{bus})$
Intercept	19.899**	3.132	16.766*
	(4.200)	(0.611)	(3.332)
LNTA	-3.341***	-0.215	-3.126***
	(8.368)	(0.622)	(7.542)
FAMILY	-8.473***	-2.787**	-5.687***
	(12.415)	(4.640)	(7.108)
CHARACT2	1,619	-0.223	1.842
	(0.840)	(0.138)	(1.122)
CHARACT3	4,931**	-0.394	5.326***
	(6,064)	(0.402)	(7.209)
TRADECR	3,439	6.448***	-3.009
	(0.540)	(12.524)	(0.449)
EQUITY	-0.009	0.019	-0.028
	(0.042)	(1.470)	(0.454)
ROE	0.039	-0.015	0.054**
	(2.001)	(2.260)	(4.063)
RELATION	0.161**	0.055*	0.106
	(5.099)	(3.364)	(2.373)
COMPETI	3.540***	1.066**	2.474**
	(7,654)	(5.174)	(4.193)
BANKER	-10.547***	-0.084	-10.463***
	(9.773)	(0.006)	(10.268)
MATURITY	0.0002	0.009	-0.008
	(0.000)	(0.801)	(0.203)
LNAMOUNT	1.355	0.064	1.292
	(2,435)	(0.086)	(2.305)
LAZY	-0.009	0.002	-0.011
	(0.019)	(0.018)	(0.032)
FIRMAGE	-0.033**	0.008**	-0.040**
	(4.029)	(5.606)	(6.267)
APPROV2	-3.965**	-2.002	-1.963
	(3.977)	(2.556)	(1.378)
APPROV3	-2.310	-2.015	-0.295
	(1.542)	(2.640)	(0.038)
INDUSTRY[1]			
'building'	-1.840	-1.215*	-0.625
	(0.561)	(3.265)	(0.066)
'retail & wholesale'	3.565**	1.231*	2.334
	(4.115)	(3.193)	(1.939)
'service'	0.478	0.279	0.199
	(0.087)	(0.153)	(0.016)
MOTHDAU	0.815	-1.688	2.503
	(0.124)	(1.988)	(1.371)
nobs	201		
-2 Log Likelihood (Initial Model)	392.30		
-2 Log Likelihood (Final Model)	192.55		
χ^2	199.75***		

[1] The manufacturing industry is the suppressed comparison category.

Wald statistics between parentheses.

* p<0.1, ** p<0.05, *** p<0.01

The regression results partly support the hypothesis that '*trade credit*' is a signalling device. Trade credit seems to influence the probability of pledging business collateral as compared to personal commitments. Receiving relatively more trade credit has a positive effect on the probability of pledging business collateral as compared to personal commitments. When reviewing the results concerning the financial characteristics, it is astonishing to see that these appear to be of minor importance! Only '*profitability*' has a significant effect on the pledging of business collateral. More profitable firms have a higher probability of granting no collateral as compared to granting business collateral. This finding contradicts the signalling hypothesis but confirms the empirical findings of previous research (e.g. Berger and Udell 1988, 1992; Klapper 2001).

Relationship characteristics appear to be extremely important in determining the use of collateral. A firm with a longer *relationship* with the financial institution is more likely, as hypothesized, to receive credit without giving any kind of collateral. In addition, they are more likely to pledge business collateral as compared to personal collateral. The acquired reputation assures that business collateral suffices. An element that appears to be even more important is the exclusivity of the relationship. Contrary to what was expected, if a financial institution operates as 'main bank' for a firm ('*banker*'), this firm is more likely to pledge collateral. This can be interpreted as a bank exploiting the power it has over the firm when being the main bank. It seems that the main bank will try to acquire as much collateral as possible in order to limit the firms' ability to obtain future loans from other lenders and to reduce the risk of excessive future borrowing such as argued by Mann (1997a, 1997b).

More competition between banks apparently has an influence on collateral pledging. If a company introduces a credit request with more banks, it diminishes the probability of granting any kind of collateral. Furthermore, the results convey that if a firm introduces a credit request with more banks, it is more likely to use business collateral as compared to personal commitments. *Loan characteristics* do not appear to have any significant effect on the pledging of collateral. Furthermore, no significant effects were found for the proxy of screening efforts. This means that the provocative proposition by Manove et al (2001) that banks could be lazy in a sense that they ask more collateral as substitute for their screening efforts is not supported by our results.

CONCLUSION

In this paper, we tried to fill the gap in the empirical literature concerning the determinants of business and personal commitments. We identified the factors that determine the use of personal commitments and tested them empirically simultaneous together with the determinants of business collateral in a multinomial logit model.

Our results suggest surprisingly that loan, lender and firm characteristics are of minor importance in determining the use of business collateral or personal commitments. From all tested variables only firm size, profitability, industry, trade credit and the organization as a family firm seem to matter. Especially this last determinant is strongly significant. Larger firms and family firms are more likely to use any kind of business or personal commitment. More profitable firms are more likely to acquire credit without pledging collateral as compared to pledging business collateral. The choice between business collateral and personal commitments is mainly determined by the determinant 'family firm'. Family firms are more likely to use personal commitments. The data also yield interesting evidence about the role of trade credit in determining the granting of business collateral versus personal commitments. The results suggest that trade credit does have a signalling effect since firms receiving more trade credit from their suppliers have a higher likelihood of receiving credit by pledging business collateral instead of using personal commitments. The provocative 'lazy banks' proposition by Manove et al (2001) is not supported by our results.

Further evidence suggests that the relationship characteristics are of major importance. A longer relationship diminishes the probability that a firm has to use personal commitments. On the contrary, when a small firm uses more competition between banks for a credit request, the probability of granting business collateral as well as personal commitments increases. The choice between business collateral and personal commitments seems to be in favour of business collateral when more competition between banks is used such as expected. If a financial institution operates as 'main bank' for a firm, that firm is also more likely to use personal or business commitments.

Finally, we find indirect evidence in the data that small firms often use more business collateral and personal commitments than is necessary during the early years. Further research is needed to scrutinize this point.

REFERENCES

Altman, E.I. – Haldeman, R.G. – Narayanan, P. (1977) Zeta analysis: a new model to identify bankruptcy risk of corporations. *Journal of Banking and Finance* 1.

Ang, J. – Lin, J. – Tyler, F. (1995) Evidence on the lack of separation between business and personal risks among small businesses. *Journal of Small Business Finance* 4(2/3).

Angelini, P. - Di Salvo, R. – Ferri, G. (1998) Availability and cost for small businesses : customer relationships and credit cooperatives. *Journal of Banking and Finance* 22.

Avery, R. – Bostic, R. – Samolyk, K. (1998) The role of personal wealth in small business finance. *Journal of Banking & Finance* 22.

Berger, A.N. - Udell, G.F. (1988) Collateral, loan quality, and bank risk. *Finance and Economics Discussion Series* 51, (Federal Reserve Board, Washington D.C.)

Berger, A.N. - Udell, G.F. (1990) Collateral, loan quality, and bank risk. *Journal of Monetary Economics* 25(1).

Berger A.N. – Udell, G.F. (1992) Some evidence on the empirical significance of credit rationing. *Journal of Political Economy 100.*

Berger, A.N. – Udell, G.F. (1995) Relationship lending and lines of credit in small firm finance. *Journal of Business* 68.

Berger, A.N. - Klapper, N. - Udell, G.F. (2001) The ability of banks to lend to informationally opaque small businesses. *Journal of Banking and Finance* 25.

Besanko, D. - Thakor, A. (1987a) Collateral and rationing: sorting equilibria in monopolistic and competitive credit markets. *International Economic Review* 28 (3).

Besanko, D. - Thakor, A. (1987b) Competitive equilibrium in the credit market under asymmetric information. *Journal of Economic Theory* 42.

Bester, H. (1985) Screening vs. rationing in credit markets with imperfect information. *American Economic Review* 75.

Biais, B. – Gollier, C. (1997) Trade credit and credit rationing. *Review of Financial Studies* 10(4).

Boot, A. - Thakor, A. (1994) Moral hazard and secured lending in an infinitely repeated credit market game. *International Economic Review* 35(4).

Booth, J.R. (1992) Contract costs, bank loans, and the cross-monitoring hypothesis. *Journal of Financial Economics* 31.

Chan, Y.S. - Kanatas, G. (1985) Asymmetric valuation and the role of collateral in loan agreements. *Journal of Money, Credit and banking* 17.

Chan, Y.S. - Thakor, A.V. (1987) Collateral and competitive equilibria with moral hazard and private information. *Journal of Finance* 42(2).

Coco, G. (2000) On the use of collateral. *Journal of Economic Surveys* 14(2).

Cole, R.A. - Wolken, J.D. - Woodburn, L.R. (1996) Bank and nonbank competition for small business credit: evidence from the 1987 and 1993 national survey of small business finances. *Federal Reserve Bulletin* 82.

De Meza, D. – Southey, C. (1996) The borrowers curse : optimism, finance and entrepreneurship. *The Economic Journal 106.*

Diamond, D. (1989) Reputation acquisition in debt markets. *Journal of Political Economy* 97(4).

Ferri, G. - Messori, M. (2000) Bank-firm relationships and allocative efficiency in northeastern and central Italy and in the south. *Journal of Banking and Finance* 24(6).

Hanley, A. (2002) Do binary collateral outcome variables proxy collateral levels ? The case of collateral from start-ups and existing SME's. *Small Business Economics* 18.

Harhoff, D. - Körting, T. (1998) Lending relationships in Germany – Empirical evidence from survey data. *Journal of Banking and Finance* 22(10-11).

Jackson, T.H. - Kronman, A.T. (1979) Secured financing and priorities among creditors. *The Yale Law Journal* 88.

Jensen, M. - Meckling, W. (1976) Theory of the firm:managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3(4).

Klapper, L. (2001) The uniqueness of short-term collateralization. *World Bank Working Paper* 2544.

Leeth, J.D. - Scott, J.A. (1989) The incidence of secured debt: evidence from the small business community. *Journal of Financial and Quantitative Analysi*s 24(3).

Maddala, G.S. (1987) Limited-dependent and qualitative variables in econometrics. Cambridge University Press New York

Mann, R.J. (1997a) Explaining the pattern of secured debt. *Harvard Law Review* 110.

Mann, R.J. (1997b) The role of secured credit in small-business lending. *The Georgetown Law Journal 86.*

Manove, M. - Padilla, J. - Pagano, M. (2001) Collateral versus project screening: a model of lazy banks. *RAND Journal of Economics* 32(4*)*.

Myers, S.C. (1977) Determinants of corporate borrowing. *Journal of Financial Economics* 5.

Ongena, S. - Smith, D.C. (2001) The duration of bank relationships. *Journal of Financial Economics* 61(3).

Petersen, M.A. – Rajan, R.G. (1994) Benefits of lending relationships : evidence from small business data. *Journal of Finance* 49(1).

Petersen, M.A. - Rajan, R.G. (1995) The effect of credit market competition on lending relationships. *Quarterly Journal of Economics* 110(2).

Schwartz, A. (1981) Security interests and bankruptcy priorities : a review of current theories. *The Journal of Legal Studies* 10.

Scott, J.H., Jr. (1977) Bankruptcy, secured debt, and optimal capital structure. *Journal of Finance* 32.

Scott, J.H., Jr. (1979) Bankruptcy, secured debt, and optimal capital structure: reply. *Journal of Finance* 34.

Scott, J.A. – Smith, T.C. (1986) The effect of the bankruptcy reform act of 1978 on small business loan pricing. *Journal of Financial Economics* 16.

Smith, C.W. - Warner, J.B. (1979a) Bankruptcy, secured debt, and optimal capital structure: comment. *Journal of Finance* 34.

Smith, C.W. - Warner, J.B. (1979b) On financial contracting: an analysis of bond covenants. *Journal of Financial Economics* 7.

Stiglitz, J. - Weiss, A. (1981) Credit rationing in markets with imperfect information. *American Economic Review* 71(3).

Stulz, R.M. - Johnson, H. (1985) An analysis of secured debt. *Journal of Financial Economics* 14.