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Credit Constraints and Determinants of the Cost of Capital in Vietnamese Manufacturing

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ABSTRACT. This paper examines the extent to which borrowing constraints restrict firm access to credit and identifies individual, firm, and loan characteristics, which determine the cost of capital in Vietnamese manufacturing. Using direct information from a Vietnamese enterprise survey the paper shows that between 14 and 25% of the enterprises are credit constrained, and these enterprises would increase their debt holdings by between 40 and 115% if borrowing constraints were relaxed. Moreover, it emerges that informal credit markets play an important role for fast growing firms. Enterprises do not appear to have the necessary time to go through the many administrative difficulties in the formal credit system if they want to "seize the day". Finally, collateralized loans face larger interest rates, explained by the significant influence of "policy lending" in Vietnamese credit markets.

KEYWORDS: credit constraints, financial markets, Vietnam

JEL CLASSIFICATION: O16, O53

1. Introduction

A former Vietnamese Secretary General once stated that Vietnam has, in principle, three problems related to future economic development: "Capital, capital and capital". According to a recent survey by MPDF (1997) the private small and medium scale enterprises (SMEs) share this view in the sense that they perceive their main obstacles to growth as "Credit, credit and credit". In the early 1990s concern among donors and Vietnamese officials about the malfunctioning of financial markets gave rise to the promotion and establishment of formal credit institutions targeted at the poor. Moreover, the government announced that policy-induced lending by State Owned Commercial Banks (SOCBs), primarily to State Owned Enterprises (SOEs), would be phased out. However, the SOCBs continued to serve mainly the SOEs, and doubt regarding the ability of public banks and the financial system in general to fulfil the growing demand for credit from the fast growing private sector emerged.

Previous studies on credit constraints have due to lack of direct measures of credit constraints typically identified unconstrained firms by dividing the sample under consideration according to the ratio of financial assets to the market value of the firm (Fazzari et al., 1988).[1] In this paper, a more direct approach is applied using two different measures of credit constraints. First, I categorize firms as being credit constrained based on replies to direct questions about whether the firm applied for credit and if they applied whether they were denied access. Second, in order to address possible self-selection issues I expand the credit constraints measure to include firms that consider themselves in need of a loan, regardless of they received a loan or not. I then use information for the non-constrained firms to get an estimate of actual debt demand, and use this estimate to measure desired debt for constrained firms, based on observed individual firm specific characteristics. This paper therefore has two main objectives. First, using a Vietnamese enterprise survey conducted in 2002 I identify credit constrained SMEs directly and determine whether there exists a gap between desired debt and observed debt. Based on this calculation, an

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estimate of the magnitude of borrowing constraints is established. Second, I use information on credit access and interest rates to identify determinants of credit access and the cost of capital facing Vietnamese SMEs.

Credit constraints and establishing the magnitude hereof have important policy implications. Differences in the cost of internal and external financing can influence the way in which the effects of fiscal policy and monetary policy are perceived. As summarized in Hubbard (1998) contractionary monetary policy raises the cost of external financing relatively more for constrained firms, both in terms of higher interest rates and as a larger spread between internal and external funds. Consequently, investment tends to be lower, than in unconstrained firms. Moreover, identifying characteristics of credit constrained firms can help policy makers to target firms which are more likely to face binding credit constraints, such as young non-household firms.

The main results are that between 14 and 25% of Vietnamese SMEs are credit constrained, and these enterprises would increase their debt holdings between 40 and 115% if borrowing constraints were relaxed. The data furthermore suggest that larger firms have access to cheaper credit, and although male entrepreneurs obtain credit more frequently, there seems to be no discrimination against women. The probability of accessing credit is higher in rural areas, but rural firms at the same time experience larger credit constraints, indicating that demand for external funds is significantly higher in rural areas than in urban cities. Moreover, non-household enterprises often face larger credit constraints, suggesting that a shift in the present policy focus from the smaller household firms towards supporting larger private and limited liability companies maybe justified. Borrower–lender relationships reduce interest rates, suggesting that relationship lending provides important information about borrower quality in the segmented Vietnamese credit market. Finally, it is suggested that "policy lending" by SOCBs give rise adverse collateral effects on the cost of capital.

The remainder of the paper is organized as follows. Section 2 identifies the characteristics of credit constrained SMEs in Vietnam and estimates the magnitude of these constraints. Section 3 put focus on the firms, which get access to credit, and examines the empirical determinants of credit availability and the interest rate on the most recent loan. Section 4 concludes.

2. Identifying credit constrained firms

Most of the empirical literature concerning firm credit constraints focuses on either q-models of investment or on an Euler equation approach (for excellent overviews see Hubbard, 1998 and Schiantarelli, 1996). As an example, the latter approach relies on the Euler equation to describe the firm's choice of capital stock in modeling investment decisions. To check whether credit constraints are present over-identifying restrictions are added to the Euler equation and tests for model misspecification are carried out. According to Bigsten et al. (2003) most studies find significant effects of such restrictions, leading to the conclusion that firms are credit constrained. I take a more direct approach, using survey data for SMEs in Vietnam to identify liquidity constrained firms.

2.1. *Data*

The data were generated in an enterprise survey conducted in 2002, gathering information for the years 2000 and 2001, respectively. The survey covered four provinces (Ha Tay, Long An, Quang Nam and Phu Tho) and three cities (Ho Chi Minh City, Ha Noi and Hai Phong), focusing on the non-state sector. In all areas covered by the survey, the sample was stratified by ownership form to ensure the inclusion of all types of non-state enterprises, including household, private, co-operative firms, limited companies and share-holding companies. The stratification, ensured first, that household enterprises account for about 70% of the enterprises (Sakai and Takata, 2000) and, second, that the 30% non-household (and non-state) enterprises were divided according to GSO (2004): Private enterprises (39%), co-operatives (7%), limited companies (37%), joint-stock companies (4%) and foreign invested firms (4%). For reasons of implementation the survey was confined to specific areas in each province/city. All in all credit data from 1106 firms is used in the following analysis.[2] In order to identify credit constraints, the firms were asked whether they during the last 5 years applied for a bank loan, other formal credit or informal credit and if they applied whether they were denied credit. Based on this information, the variable labelled *unconstrained 1* was constructed. Due to self-selection problems, the firms were asked whether they still are in need of a loan, regardless of they received a loan or not. Based on this additional information the variable *unconstrained 2* was created.

Table I shows the connection between the two variables describing credit constrained Vietnamese firms. We see that according to the credit constraints definition used in Cox and Jappelli (1993) (*unconstrained 1*) approximately 14% of enterprises rapport that they have applied for credit and was denied credit. However, considering the second measure of credit constraints an additional 114 firms perceive themselves as being constrained although they have never applied for credit. That is approximately 25% of the enterprises consider themselves credit constrained according to the second measure.

Table II displays sample means for selected variables covering the whole sample and for subsamples where firms hold debt and are unconstrained in their access to credit, respectively. It transpires, first of all, that Vietnamese firms have a relative low debt to assets share, confirming that a large part of investment financing by Vietnamese SMEs is done through retained earnings. Furthermore, only 54% hold positive debt even though only between 14 and 25% of the enterprises considers themselves credit constrained.

Firms that are unconstrained do not differ much from constrained firms in terms of size measured by average total assets and revenue. Moreover, it seems as if constrained firms are on average experiencing larger growth rates (measured as the growth in real revenue from 2000 to 2001) than unconstrained firms. From column 2 in Table II it can be seen that firms holding debt are often larger, have larger financial assets share and grow faster than non-debt holders. Debt holders are often relatively young firms, and older firms are often on average less credit constrained than their younger counterparts.

Another group of variables includes characteristics of the owner. Enterprises are primarily owned by men (77.8%).[3] Male owned firms are more likely to hold debt, but on average there seems to be no gender discrimination in credit markets based on the unconstrained measures. Regarding measures of the level of human capital, I use the average educational level of the enterprise owner. There is some indication lower skilled firm owners holding a relative larger part of the debt. Regarding credit constraints, there does not seem to be much difference between constrained and unconstrained groups in terms of educational level.

Table II also identifies a set of firm specific characteristics, related to ownership structure and location. Location is modelled using indicator variables representing each area. The 2002 survey covered three urban cities HCMC, Ha Noi, and Hai Phong, and four rural provinces Ha Tay, Long An, Phu Tho and Quang Nam, and it is noticeable that a relatively large part of the enterprises in rural areas are debt holders. One possible explanation for this is that there is little uncertainty about land holding rights in rural areas. Many households possess the necessary land-use-rights documents, which can be used as collateral. The situation in urban areas is more complex, and the possibilities to use land-holding rights as collateral are more limited.

TABLE I
Constrained firms: two definitions

	Constrained 2	Unconstrained 2	Total observations	% of total
Constrained 1	158	0	158	14.3
Unconstrained 1	114	834	948	85.7
Total observations	272	834	1106	
% of total	24.6	75.4		

TABLE II
Mean statistics

	Total sample	Debt holders	Unconstrained 1	Unconstrained 2
Assets (log)	12.765	12.858	12.766	12.753
Financial assets share	0.148	0.172	0.140	0.145
Physical assets share	0.852	0.828	0.860	0.855
Revenue (log)	12.423	12.703	12.393	12.395
Revenue growth	0.102	0.120	0.092	0.088
Profitshare	0.167	0.171	0.162	0.163
Age	11.313	10.662	11.451	11.392
Gender (Male = 1, Female = 0)	0.778	0.803	0.767	0.765
Education	9.596	9.454	9.567	9.508
HCMC	0.146	0.116	0.157	0.164
Ha Noi	0.166	0.133	0.174	0.165
Hai Phong	0.164	0.125	0.170	0.135
Ha Tay	0.182	0.221	0.177	0.198
Long An	0.147	0.162	0.141	0.146
Phu Tho	0.101	0.130	0.097	0.108
Quang Nam	0.094	0.114	0.083	0.083
Household enterprise	0.732	0.690	0.750	0.763
Private firm	0.089	0.109	0.077	0.078
Cooperative	0.085	0.081	0.089	0.080
Limited/Share holding	0.094	0.120	0.084	0.079
Debt share	0.083	0.155	0.078	0.088
Unconstrained 1	0.857	0.847	1.000	1.000
Unconstrained 2	0.754	0.827	0.880	1.000
Positive debt holders	0.537	1.000	0.531	0.589
Observations	1106	594	948	834

Turning to ownership structure, private enterprises as well as limited and share-holding companies are relatively more credit constrained than household firms, as shown by the drop in the share from the total sample in column 1 to the unconstrained sample in columns 3 and 4. Moreover, the proportion of household enterprises is lower in the debt holders group than in the entire sample. Finally, it seems as if retained earnings is still a major source of firm financing in Vietnam, given the relative low debt to assets share (8.3%).

2.2. *Empirical model*

Joint analysis of the desired level of debt and credit constrained firms can be performed using a two step sample selection model, which has only been used in analysing credit constrained households in the US (see Cox and Jappelli, 1993; Duca and Rosenthal, 1993). In this approach it is recorded whether enterprises with positive debt holdings are credit constrained and conditional on being a credit constrained firm, holding positive debt, I estimate the desired level of debt of the individual firm. Assume that the desired level of debt to assets ratio, d, for firm i, is a linear function of a vector of observables x_{1i}.

$$d_i = x_{1i}\beta + \varepsilon_{1i} \tag{1}$$

where ε_{1i} is a random component for firm i. The underlying estimation problem is that the desired debt to asset share for firm i (described by d_i) is only observed if the demand for debt is positive ($b_i = 1$) and the firm is not credit constrained ($n_i = 1$). A direct estimate of equation (1) is therefore likely to be biased, if the variables which determine whether a firm is credit constrained or has debt also affect the level of desired debt. Given that some firms prefer not to hold debt, equation (2) controls for the fact that debt holdings are truncated from below by zero.

$$b_i = 1[x_{2i}\beta_2 + \varepsilon_{2i} > 0] \tag{2}$$

where b_i is a binary variable, which takes the value of one if the firm holds positive debt, x_{2i} contains proxies for the convenience of having debt, and ε_{2i} is a firm specific error term.

Direct measures of credit constraints have generally not been available in previous studies, and Jappelli (1990) show that the indirect proxies used often generate large errors when classifying unconstrained individuals. This highlight the advantages of identifying directly whether or not a firm is credit constrained as done in the present study. The underlying latent variable credit constraint model is given by equation (3)

$$n_i = 1[x_{3i}\beta_3 + \varepsilon_{3i} > 0] \quad (3)$$

where n_i is a binary variable, which takes the value of one if the firm is non-constrained, x_{3i} is a vector of credit constraint proxies, and ε_{3i} is a random error term for firm i.

The inverse Mills ratios from the estimates of equations (2) and (3) are used to correct for selection bias, ensuring consistent estimates of the debt demand in equation (1). The equation for d_i for the selected sample is therefore

$$E(d_i|b_i=1,n_i=1)=x_{1i}\beta_1+E(\varepsilon_{1i}|b_i=1,n_i=1) \quad (4)$$

Following Cox and Jappelli (1993) I assume that the error terms are normally distributed with mean zero and variance σ_1, σ_2 and σ_3, respectively. I also use the standard probit normalization ($\sigma_2=\sigma_3=1$) to obtain consistent estimates of β_2 and β_3. Estimating debt demand therefore boils down to

$$d_i = x_{1i}\beta_1 + \frac{\phi(b_i)}{F(b_i)}\gamma_2 + \frac{\phi(n_i)}{F(n_i)}\gamma_3 \quad (5)$$

where $\frac{\phi(b)}{F(b)}$ and $\frac{\phi(n)}{F(n)}$ are the inverse Mill's ratios, and $\phi(*)$ and $F(*)$ are the probability and cumulative distribution function, respectively.

2.3. *Credit demand and constraints*

A reduced form firm debt demand function can be estimated using only unconstrained firms that hold positive debt. Table III presents the regressions for being unconstrained and for holding positive debt, respectively. It is clear that the probability of being unconstrained is larger in HCMC than in the other cities considered. Regardless of which credit constraints measure used rural provinces Long An and Quang Nam face larger constraints than urban areas. This is in accordance with Van de Walle and Cratty (2004), who state that post-reform government policies in terms of access to credit has tended to favour urban areas. Furthermore, larger firms such as private firms as well as limited and share-holding companies are less likely to be unconstrained. This is contrary to the general perception that financing constraints are more binding for smaller firms, which have a higher probability of going bankrupt (the positive relationship between size and survival).[4] Moreover, using the unconstrained 1 measure it seems as if firms with a higher financial assets share have a lower probability of being unconstrained. However, the significance of this result disappears using the perceived credit constraints measure in column 2.

Results from the estimation of the debt incidence equation indicate that the probability of holding debt increases with revenue earnings. Moreover, holding debt is negatively related to age. Older firms are often more settled and less likely to engage in activities that require capital demanding initiatives, which is in accordance with findings that older firm are less innovative. Higher levels of education reduce the probability of having positive debt. This finding is somewhat surprising given that firm revenue and growth is controlled for.

Table IV report results for both the unadjusted generalized tobit estimation and the debt equation corrected for the two sources of selection bias. First of all consider the sign pattern for the selection terms in columns 2 (*unconstrained 1*) and 3 (*unconstrained 2*). The coefficient of the first selection term (non-constrained) considers the correlation between unobservables in the equation for being unconstrained and those in the equation for the desired amount of debt. The negative correlation therefore implies that unobservables which reduce desired debt increase the probability of being unconstrained. This effect is present regardless of which credit constraints definition used. Similarly, the positive coefficient of the second selection term represents the fact that unobserved factors that increase the probability of holding debt also increase the desired debt amount. This effect is only significant for one of the credit constraint definitions.

TABLE III
Non-constrained firms holding positive debt

	Unconstrained 1		Unconstrained 2		Debt incidence	
	Coefficient	*t*-statistics	Coefficient	*t*-statistics	Coefficient	*t*-statistics
Assets (log)	−0.023*	(1.67)	−0.008	(0.41)	0.006	(0.27)
Financial assets share	−0.164***	(2.58)	−0.070	(0.79)	0.178	(1.54)
Revenue (log)	0.012	(1.00)	0.020	(1.27)	0.093***	(4.64)
Revenue growth	−0.036	(1.39)	−0.057*	(1.73)	−0.008	(0.20)
Profitshare	−0.123*	(1.93)	−0.137	(1.55)	−0.042	(0.37)
Age	0.000	(0.23)	−0.000	(0.09)	−0.004*	(1.85)
Gender (Male = 1, Female = 0)	−0.032	(1.23)	−0.046	(1.43)	0.054	(1.37)
Education	0.001	(0.31)	−0.001	(0.21)	−0.017***	(3.14)
Ha Noi	−0.048	(1.06)	−0.114**	(2.11)	0.048	(0.83)
Hai Phong	−0.086*	(1.85)	−0.261***	(4.67)	0.064	(1.11)
Ha Tay	−0.187***	(3.65)	−0.055	(1.02)	0.343***	(6.29)
Long An	−0.184***	(3.44)	−0.131**	(2.31)	0.253***	(4.34)
Phu Tho	0.218***	(3.53)	−0.059	(0.95)	0.370***	(6.22)
Quang Nam	−0.224***	(3.55)	−0.181***	(2.68)	0.322***	(4.93)
Private	−0.113***	(2.68)	−0.106**	(2.00)	0.065	(1.04)
Coop	−0.011	(0.24)	−0.068	(1.19)	0.007	(0.11)
Limited/share holding	−0.183***	(3.35)	−0.218***	(3.55)	0.086	(1.27)
Observations	1106		1106		1106	
Pseudo *R*-sq	0.07		0.05		0.11	

Probit estimates, marginal effects. *, **, *** indicates significance at a 10%, 5% and 1% level, respectively.
Base: Household enterprise, HCMC. All regressions included a constant term.

Total assets and revenue earnings exert opposing effects on the demand for debt, where increasing assets lower the desired debt share by around 2–5%, and larger revenue earnings increase desired debt share by approximately 4–6%. Moreover, the larger the share of financial assets the more debt the firm wishes to hold. Fast growing firms have a significantly larger desire for external funds. This might suggest that although relatively few firms are credit constrained, these constraints may be binding to a larger extent for the fast growing enterprises. In the unadjusted case age comes out insignificant, however adjusting for the selection bias it turns out that older firms have lower demand for debt than their younger counterparts, when using one of the credit constraint definitions. A plausible explanation is that firms over the life-cycle increase the probability of self-financing and over time get less innovative, thereby reducing their demand for external funds. Moreover, the negative gender effect in the unadjusted equation disappears when including the two selection terms. This finding, combined with the results in Table III, suggests that there is no direct discrimination against women in Vietnamese credit markets. This is contrary to the findings in Fafchamps (2000) for the manufacturing sector in the African region where a gender bias is found, suggesting the existence of regional differences. The demand for debt is relatively high in rural areas, when correcting for the two selection biases. The fast demise of the credit cooperative system in the first phase of the Doi Moi reform may be responsible for the unfulfilled credit demand and the credit constraints facing rural areas.[5]

Finally, Table IV shows that the demand for debt is significantly higher among private firms, cooperatives, limited and share-holding companies as compared to household enterprises. Not surprisingly limited liability and share-holding companies demand 39–44% more external funds as compared to household enterprises.

2.4. *The credit gap*

The credit gap can be defined as the difference between the average desired level of debt, d (the sum of constrained firms' desired debt d_c and

TABLE IV
Debt demand

	Unadjusted		Selectivity adj 1		Selectivity adj 2	
	Coefficient	*t*-Statistics	Coefficient.	*t*-Statistics	Coefficient	*t*-Statistics
Assets (log)	−0.033**	(2.55)	−0.021**	(2.06)	0.050***	(3.32)
Financial assets share	0.140**	(2.55)	0.378***	(3.58)	0.208***	(3.11)
Revenue (log)	0.017	(1.60)	0.063**	(2.52)	0.037*	(1.71)
Revenue growth	0.054***	(2.86)	0.089***	(3.90)	0.123***	(3.67)
Age	−0.000	(0.53)	−0.002*	(1.76)	−0.001	(0.79)
Gender (Male = 1, Female = 0)	−0.041**	(2.43)	0.022	(0.75)	0.025	(0.79)
Education	0.003	(1.35)	−0.007	(1.43)	0.001	(0.23)
Ha Noi	−0.094***	(3.17)	−0.034	(1.04)	0.036	(0.75)
Hai Phong	−0.066**	(2.04)	0.021	(0.54)	0.210**	(2.07)
Ha Tay	−0.048	(1.63)	0.272**	(2.18)	0.075	(0.86)
Long An	0.010	(0.34)	0.276***	(2.65)	0.191**	(2.36)
Phu Tho	0.010	(0.28)	0.375***	(2.59)	0.144	(1.41)
Quang Nam	−0.048	(1.20)	0.294**	(2.20)	0.204*	(1.84)
Private	0.048*	(1.81)	0.185***	(3.36)	0.167***	(3.26)
Coop	0.107***	(3.12)	0.125***	(3.44)	0.172***	(3.68)
Limited/Share holding	0.202***	(5.82)	0.388***	(4.94)	0.438***	(4.42)
Non-constrained			−0.604***	(2.58)	−0.770**	(2.41)
Debt incidence			0.356**	(2.07)	0.139	(0.92)
Observations	503		503		503	
R-squared	0.28		0.29		0.30	

Dependent variable: Total debt to assets share. Generalized tobit estimates, marginal effects. *, **, *** indicate significance at a 10%, 5% and 1% level, respectively.
Base: HCMC, household enterprise. All regressions included a constant term. Estimates in columns 2 and 3 are based on Mills ratios calculated using estimates where revenue growth is excluded in the debt incidence equation, and log revenue is excluded in the unconstrained equations. Selectivity adj. 1 and Selectivity adj. 2 refers to estimations using unconstrained 1 and unconstrained 2 measures, respectively.

unconstrained firms desired debt d_{uc}), and the average actual debt d^{a} (the sum of constrained firms' actual debt $d_{\mathrm{c}}^{\mathrm{a}}$ and the actual debt of unconstrained firms $d_{\mathrm{uc}}^{\mathrm{a}}$). Therefore for firms that are not credit constrained $d_{\mathrm{uc}} = d_{\mathrm{uc}}^{\mathrm{a}}$. The average gap between desired and actual debt can be written as

$$GAP = d_{\mathrm{c}}\frac{f_{\mathrm{c}}}{f} + d_{\mathrm{uc}}\frac{f_{\mathrm{uc}}}{f} - d^{\mathrm{a}} = x_{\mathrm{c}}\beta_1\frac{f_{\mathrm{c}}}{f} + d_{\mathrm{uc}}\frac{f_{\mathrm{uc}}}{f} - d^{\mathrm{a}} \tag{6}$$

where f_{c} is the number of constrained firms, and f_{uc} is the number of unconstrained firms, so $f = f_{\mathrm{c}} + f_{\mathrm{uc}}$. The vector x_{c} contains the means of observables for the constrained firms, and $\hat{\beta}_1$ is the estimate of β_1 taken from Table IV. The average desired debt to asset share was estimated to be between 40 and 115% larger than the actual debt to asset share for constrained Vietnamese firms. These results indicate that even though rejected applicants and discouraged borrower's amount to only between 14 and 25% of the sample (depending on the definition used), Vietnamese SMEs would acquire on average 8–24% more debt if credit constraints were removed. However, given the relative low debt ratio among Vietnamese firms a liability increase of 24% would still leave the average debt to assets share at a low level.

3. The cost of capital

In this section the analysis is taken one step further and focus on the group that at some point in time were able to obtain credit from either formal or informal sources. Table V gives an overview of enterprises having accessed credit even though they consider themselves credit constrained. As reported above between 14 and 25% of the enterprises are credit constrained, and 54% hold positive debt. However, during the 1994–2002 period between 26 and 45% of the constrained firms managed to get access to some external funds. Moreover, 59 firms out of the 571 that did not get credit access during the 1994–2002 period had debt obtained before 1994. Only between 49 and 56% of the non-constrained firms applied for and got a loan, confirming that many SMEs use internal funds to finance new investments.

Table VI reports sample means of selected variables for the enterprises that have accessed credit, and for sub-samples divided by source of credit. First, the monthly interest rate charged is 0.6% on average and collateral was required in only 42% of the cases. Dividing by informal (private moneylender and friends and relatives) and formal segments (private and government banks, enterprises and poverty alleviation and job creation programmes)[6] it can be seen that the informal sector makes up around 30–35% of the credit market, depending on whether the measure is divided by source or by amount of credit.[7] Government banks (State Owned Commercial Banks, SOCBs)[8] provide approximately 40% of the credit, whereas private banks only make up for 5% of the total credit extended to manufacturing firms in Vietnam. Compared to the results reported in McMillan and Woodruff (1999a), where most private firms are excluded from formal financial markets (only 21% received formal bank loans), it seems as if formal credit possibilities have increased since 1995–1996.

Informal credit is characterized by loans where no collateral is required, but the interest rate ranges between 0% and as high as 6% per month, depending on whether the source of credit is a private moneylender (average 1.9%) or friends and relatives (average 0.3%). Note also that 73% of friends and relatives did not charge any interest. This corresponds to the findings in McMillan and Woodruff (1999a) where interest rates paid by private manufacturing firms in informal credit markets in Vietnam are as high as 4–7% per month. One

TABLE V
Debt, credit access and constraints

	Positive debt	No debt	Total
Constrained	91 (103)	67 (169)	158 (272)
Not constrained	503 (491)	445 (343)	948 (834)
Total	594 (594)	512 (512)	1106
	Credit accessed	No Credit accessed	Total
Constrained	71 (71)	87 (201)	158 (272)
Not constrained	464 (464)	484 (370)	948 (834)
Total	535 (535)	571 (571)	1106
	Credit accessed	No Credit accessed	Total
Positive debt	535	59	594
No debt	0	512	512
Total	535	571	1106

Note: The number of firms in parenthesis relates to the unconstrained 2 measure.

TABLE VI
Mean statistics

	Credit access	Money lender	Friends and relatives	Private bank	Government bank	Enterprise	Programme
Revenue growth	0.121	0.267	0.114	0.049	0.135	0.039	0.136
Interest rate (monthly, %)	0.601	1.867	0.306	1.085	0.901	0.087	0.258
Loan amount (log)	10.309	10.402	9.899	9.789	10.862	11.079	9.539
Collateral (Yes = 1, No = 0)	0.419	0.000	0.011	0.815	0.895	0.059	0.149
Relationship (Yes = 1, No = 0)	0.656	0.600	0.733	0.778	0.531	0.941	0.662
Share of total credit supply	1.000	0.028	0.329	0.050	0.391	0.064	0.138
Observations	535	15	176	27	209	34	74

feature of the data is that firms obtaining loans from private moneylenders experience relatively large revenue growth rates. Formal loans often involve time-consuming procedures in fulfilling applications and other administrative difficulties that slow down the loan approval processes. Firms which experience increased demand for their products and wish to expand production may not have the time to go through administrative difficulties in the formal credit system if they want to "seize the day". It is therefore possible that private moneylenders make fast growing firms able to meet increasing demand.

Interest rate diversity in the formal credit market is also observed. Private and government banks charge on average the highest interest rates (monthly rates between 0.9 and 1.1%, on average) in the formal market, and in order to obtain a loan from either of these two sources the firms are often required to offer collateral (over 80% of the loans are collateralized). However, on average government banks offer larger loans than can be obtained in informal credit markets. In our sample, firms that obtain loans from private banks are characterized by being male owned, with low skill, and operating a household enterprise in rural areas. This also explains why the average loan amount from private banks in our sample is relatively small. Government credit programmes are characterized by offering relatively small loans (often to household enterprises), but at a low interest rate and often without collateral requirements. Loans from other enterprises can in many cases be seen as a form of interfirm trade credit, which is often characterized by relatively low rates of interest and collateral requirements. Moreover, the loans obtained are relatively large, and in 94% of the cases the borrower has prior relations with the creditor.[9] This is in accordance with McMillan and Woodruff (1999b), who show that interfirm relationships are associated with larger credit, at a rate that diminishes with time. However, this form of interfirm credit relationships is more common among private enterprises, cooperatives, and limited and shareholding companies as compared to household SMEs.

3.1. *Credit access and determinants of loan rates*

Table VII presents the results from analysing the determinants of credit access. Column 1 contains the full sample, whereas column 2 and 3 only consider constrained and non-constrained enterprises, respectively. As described above a total of 535 enterprises accessed credit out of the 1106 sampled.

Consistent with previous studies for both developed (Uzzi, 1999) and developing countries (Bigsten et al., 2003) I find that firms are more likely to access credit the larger they are.

TABLE VII
Determinants of credit access

	All	Constrained	Non-constrained
Revenue (log)	0.079***	0.141**	0.067***
	(4.18)	(2.45)	(3.33)
Age	−0.004*	−0.010	−0.003
	(1.71)	(1.61)	(1.07)
Gender (Male = 1, Female = 0)	0.081**	0.199*	0.079*
	(2.10)	(1.68)	(1.88)
Education	−0.019***	−0.011	0.019***
	(3.48)	(0.73)	(3.31)
Rural	0.301***	−0.215	0.361***
	(7.86)	(1.33)	(8.97)
Observations	1106	158	948
Pseudo R-sq	0.10	0.14	0.12

Probit estimates, marginal effects. *, **, *** indicate significance at a 10%, 5% and 1% level, respectively.
All regressions log assets, financial assets share, firm growth, profit share, ownership type dummies and a constant term. Using the unconstrained 2 measure did not change the qualitative results in Table VII.

Moreover, the probability of accessing credit appears to be negatively related to firm age. This probably reflects that older firms to a larger extent finance investments using accumulated profits. Turning to specific owner characteristics it appears that male owned firms obtain credit more frequently than female owned firms. Education seems to play an important role in the credit allocation process. The negative correlation between education and accessing credit might reflect that owners with higher educational levels have lower demand for credit or that better educated owners are more likely to know when their application will be rejected and therefore refrain from applying. Location is of significant importance in determining access to credit. In our sample the probability of accessing credit is higher in rural than in urban areas. Most of government bank credit is allocated towards rural areas confirming that local governments often are distinctly protective of firms in rural areas, which are more oriented towards serving local markets and therefore tend to escape some of the credit barriers inherent in larger, possibly more outward oriented markets.

Regressions that explain the variation in the interest rate quoted on the most recent loan are reported in Table VIII. Consistent with other studies (Petersen and Rajan, 1994, for the US), there is a statistically significant indication of firm size (measured by total assets) being negatively related to the cost of capital, but measured in terms of real revenue a positive effect emerges. The average combined effect of these two measures of size is negative. That is, larger firms get cheaper credit, which corresponds well with the results obtained in Uzzi (1999) for U.S. non-agricultural SMEs.

The size of the loan has a positive influence on the interest paid. However, this effect does not hold when controlling for source (column 2). Contrary to results normally found in the literature collateral is positively correlated with interest rates.[10] Explanations for this result may be found in the somewhat adverse lending criteria facing the State Owned Commercial Banks (SOCBs) in Vietnam. Although the government has announced that policy-induced lending is being phased out, "policy lending" has remained a defining characteristic of the SOCBs and the share of non-performing loans (NPLs) is still large. As an example of the policy induced lending schemes, the requirement to put up collateral when borrowing from SOCBs were abolished in 1998 as long as a business plan was presented (Kovsted et al., 2004). Despite the

TABLE VIII
Cost of capital determinants

	(1)		(2)	
	Coefficient	*t*-Statistics	Coefficient	*t*-Statistics
Assets (log)	−0.102***	(2.76)	−0.085***	(2.93)
Revenue (log)	0.044	(1.53)	0.054**	(2.24)
Loan amount (log)	0.054***	(2.60)	0.024	(1.26)
Collateral (Yes = 1, No = 0)	0.413***	(8.10)	0.143***	(2.77)
Relationship (Yes = 1, No = 0)	−0.165***	(3.31)	−0.147***	(3.09)
Moneylender			1.095***	(3.00)
Friends and relatives			−0.404***	(6.10)
Private Bank			0.276***	(5.06)
Enterprise			−0.644***	(7.96)
Programme			−0.457***	(7.37)
Observations	535		535	
R-squared	0.28		0.50	

OLS, robust t-statistics, marginal effects.
*, **, *** indicate significance at a 10%, 5% and 1% level, respectively.
Base: Government bank. All regressions included debt and financial assets share, firm age and growth, profit share, owner characteristic, location and legal structure dummies, and a constant term. Loans were granted between 1994 and 2002. Time dummies for the year the loan was granted are therefore included. Only the most recent loan is considered.

four major SOCBs account for between 70 and 80% of the financial sector, two of the banks have not been able to present profits the last 5 years. Lack of competitive pressure limits the incentives to improve capabilities with regards to credit analysis. In addition, lack of appropriate accounting standards makes it almost impossible to evaluate individual projects and it therefore becomes increasingly difficult to determine the collateral needed.

Other loan criteria than economic ones may therefore have a significant influence when evaluating loan applications and given that government banks provide a major share of the credit the normal picture between collateral and interest rates may well be distorted. Table IX gives an indication of the above argument. Looking strictly at private banks, larger loan amounts and loans based on collateral are charged with significantly lower interest rates, as found in most of the related literature. Government banks charge significantly higher interest rates on collateralized loans, indicating that government banks may use other/different criteria for determining interest rates.

A positive significant effect on the cost of capital exists when borrowing from private moneylenders, but also when borrowing from private banks as compared to loans obtained from government banks. Relatives, friends, other enterprises and government credit programmes charge significantly lower interest rates than government banks. Finally, from Table VIII it is clear that firms which have borrowed from the creditor before (Relationship), and have built up some kind of business relationship are faced with significantly lower costs of capital. This result is consistent with findings from the US (Berger and Udell, 1995; Uzzi, 1999) where firms with longer banking relationships borrow at lower rates. However, note from Table IX (in the case of private banks) that relationship lending is associated with larger interest rates.

4. Conclusion

The aim of this paper was two fold. First, I used direct information to identify credit constrained firms, and found that approximately 14–25% of Vietnamese SMEs are financially constrained. Removal of this constraint was estimated to increase external debt by between 8 and 24% on average. At a first glance, this might seem as a relatively small effect. For the constrained group a removal of constraints would boost liabilities by around 40–115%, however from a low base. Second, I analysed firms, which get access to credit, and examined the empirical determinants of credit availability and the interest rate on the most recent loan. The analysis demonstrated that: (a) Around 35% receive credit from informal sources. (b) Larger firms get cheaper credit. (c) Informal credit markets play an important role for fast growing firms, suggesting that enterprises may not have the time to go through administrative difficulties in the formal credit system if they want to "seize the day". (d) While the probability of accessing credit is higher in rural areas, rural firms experience at the same time larger credit constraints, indicating that demand for external funds is significantly higher in rural areas than in the larger urban cities. (e) Non-household enterprises

TABLE IX
Government versus private banks

	Government bank		Private bank	
	Coefficient	*t*-Statistics	Coefficient	*t*-Statistics
Loan amount (log)	−0.015	(0.93)	−0.094***	(3.63)
Collateral (Yes = 1, No = 0)	0.104**	(2.21)	−0.215***	(7.04)
Relationship (Yes = 1, No = 0)	−0.021	(0.79)	0.186***	(3.55)
Observations	209		27	
R-squared	0.29		0.96	

Note: See Table VIII for details.

often face larger credit constraints, suggesting that a shift in policy focus from the smaller household firms towards supporting larger private and limited liability companies is needed. (f) Borrower lender relationships reduce interest rates, indicating that relationship lending gives important information about borrower quality in the segmented Vietnamese credit market. (g) Finally, collateralized loans face larger interest rates, explained by the significant influence of "policy lending" in Vietnamese credit markets.

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Notes

[1] See Schiantarelli (1996) for an overview of the problems faced when using the q-type and the Euler equation approaches.

[2] Further details on the survey and sampling procedures can be found in Rand et al. (2004).

[3] This finding can be contrasted with Vijverberg and Haughton (2004) analysing non-farm enterprises in the Vietnamese Living Standards Survey (VLSS). They report that only 43% of the enterprises are male owned. However, this might reflect that the question posed in the VLSS is "who among the household members is most knowledgeable about the activities of the enterprise", which is not directly a question about ownership.

[4] The results reported here are consistent with Hansen et al. (2004), who document that the positive correlation between firm size and survival is not present in these data. The result is furthermore consistent with results reported in Mata et al. (1995) for Portuguese data, Audretsch et al. (1999) for Italian firms and Almus and Nerlinger (2000) using data for German manufacturing firms.

[5] The Doi Moi reform which started in 1986 was basically a decentralization of state economic management, to instead rely on the private sector as an engine of economic growth. It included the introduction of market orientated monetary policy which reduced inflation sharply. Exchange rate and interest rate control was to some extent loosened and in terms of agricultural policies land-use-rights were introduced. Moreover, enterprises and farmers were allowed to buy inputs and market products under free market conditions. For more detail on the reform within the financial sector see Kovsted et al. (2004).

[6] Vietnam Bank for Social Policies (VBSP) took over the functions of the Vietnam Bank for the Poor and the People's Credit Fund network. VBSP concentrates its government subsidized lending to poor households and businesses in remote areas. (World Bank, 2003)

[7] Duong and Izumida (2002) analyse credit issues for households in Vietnam. They report that the informal sector only accounts for around 20% of total loans. However, my estimates are more in line with those reported in McMillan and Woodruff (1999a) where the informal credit system and trade credits play the most important role in supplying credit to SMEs.

[8] The four largest SOCBs are The Vietnamese Bank for Agriculture and Rural Development (VBARD), the Industry and Commerce Bank of Vietnam (Incombank), Foreign Trade Bank of Vietnam (Vietcombank) and the Vietnamese Bank for Investment and Development (VBID). These are the leading banks in the banking system with more than 230 branches in all cities and provinces in Vietnam. In 1999 the outstanding loan volume of the four SOCBs accounted for 73% of all loans in the economy (Kovsted et al., 2004). Among the SOCBs it is mainly Vietcombank and VBARD that have an extensive branch network at the district and village levels. They are therefore the main lenders to private enterprises.

[9] The relationship dummy takes on a value of one if the firm has borrowed from the creditor before and zero otherwise.

[10] Analyzing the sub-sample where only strictly positive interest is charged does not change the overall picture reported.

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