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## An empirical analysis of credit accessibility of small and medium sized enterprises in Vietnam

### Abstract

In Vietnam, SMEs account for up to 98% of the total number of enterprises. They contribute about 48% to the country's GDP, 20% to export value and provide jobs for 77% of the country's labor force. However, majority of the SMEs are micro enterprises with very limited access to resources such as advanced technology and formal credit, etc. Despite their significant contributions to social and economic development, SMEs are often regarded as "the missing middle" – they are usually not the subject of interest for commercial banks while their loans might be too large to borrow from microfinance institutions. This study surveys SMEs credit accessibility, identify the factors that affect their credit access, and the interest rate charged on their loan in Vietnam. Primary data are obtained from a survey of 487 SMEs in Hanoi in June 2013. Logistic regression is used to determine SMEs' ability to access to credit and ordinary least square to estimate the interest rate charged on the SMEs largest loan. The results show owner characteristics, educational level and gender are the most important factors in determining the access to credit, followed by SMEs relationship with banks and customers. With regards to the loan interest rate, the owner characteristics variables are non-significant. The most expensive source of financing is from private money lender, followed by commercial bank loan and microfinance.

**Keywords:** credit accessibility, SME, informal finance, loans, Vietnam.

**JEL Classification:** G320, D920.

### Introduction

Small and medium sized enterprises (SMEs) play a crucial role in economic development, both in developing and developed countries. The contribution of SMEs to the economy can be seen through the value added every year generated by SMEs such as employment, export participation, poverty alleviation, women empowerment, etc. In low income countries, it is undeniable that most of the enterprises are small scale and their labor force also works mostly for small enterprises. For example, 80-90% enterprises in developing Asia are SMEs and attract 50-80% of total employment (Tambunan, 2008). Many studies have found that SMEs create more jobs than large enterprises (de Kok et al., 2011) because SMEs are labor-intensive (Hobohm, 2001). According to a report from the Association of Southeast Asian Nations (ASEAN) Secretary (2011), in Southeast Asia (SEA), SMEs accounts for more than 92% of total enterprises in all member countries. They also create a significant number of jobs, ranging from 56% in Malaysia to 97% in Indonesia. In terms of contribution to country's Gross Domestic Product (GDP), SMEs make up for 60% GDP in Singapore, 56.63% in Indonesia, and about 20 to 40% in the other SEA countries.

In Vietnam, SMEs account for up to 98% of the total number of enterprises. They contribute about 48% to the country's GDP (MPI, 2012) and 20% to export value (ESCAP, 2011). SMEs provide jobs for 77% of the country's labor force (ESCAP, 2011). However, majority of the SMEs are micro enterprises with very limited access to resources such as advanced technology and formal credit, etc.

Despite their significant contributions to social and economic development, SMEs are often regarded as "the missing middle" – they are usually not the subject of interest for commercial banks while their loans might be too large to borrow from microfinance institutions. Data collected from SMEs Manufacturing Survey 2009 showed that out of 2654 surveyed SMEs, 37.6% have applied for bank loans while 62.4% applied for informal sources. Of the 997 SMEs that applied for formal loans, 22% reported having problem in obtaining the loan while 40% of the remaining 1657 SMEs that used informal loans chose informal creditors because of flexible payback condition. A report from the Vietnam Ministry of Planning and Investment (2012) also shows that up to 30% of SMEs were unable to access financing while the other 30% can but faced many difficulties.

Given the important role of SMEs in development, their difficulty in financing, the claim that lacks of financing adversely affect their performance. This study surveys SMEs credit accessibility, identifies the factors that affect their credit access, and the interest rate charged on their loan. The study provides a deep insight into the SMEs credit access situation and the results from empirical models will help to enhance SMEs credit accessibility.

The rest of the paper is organized as follows: Section one provides a review of the literature on the determinants of credit accessibility. Section 2 gives the methodology. Section 3 presents empirical results. The final section concludes the paper.

### 1. Literature review

There are several constraints that impede the performance of SMEs in Vietnam. These constraints include low quality of labor and technology, unfa-

avorable business environment, modest capacity of owner/manager, and lack of financing. With regards to low quality of labor and technology, majority of SMEs in Vietnam operate under poor technology and low-skilled labor that result in their low productivity. Furthermore, the business environment in Vietnam remains unfavorable for the development of SMEs, particularly because of institutional and legal barriers. In developing countries such as Vietnam where the quality of institutions is low, SMEs find it very hard to obtain business license and establish their business as they have to go through a lot of procedures as well as regulations. Empirical evidence across countries has confirmed the impact of regulatory burden on SMEs development (Peci, Kutllovci, Tmava & Shala, 2012; Samitowska, 2011). In 2012, Vietnam ranked 99 out of 185 countries and regions on ease of doing business, lagging behind East Asia and Pacific countries as a whole with a ranking of 76. The number of procedures to set up a business in Vietnam was nine in 2011 compared to five in Thailand and four in Malaysia. Similarly, the time required to start a business in Vietnam was 44 days while the latter is 29 and 6, respectively (Doing Business, World Bank Database, 2012).

Further the capacity of SMEs owners/managers is often low. Internal management of Vietnamese SMEs is often underdeveloped, unprofessional and weak that mainly based on the limited and personal experiences of the owners. There is usually no clear distinction between the rights and duties of owners, employers and employees. Most enterprises lack strategies and long-term business plans, and operate with poor trained professional staff (MPI, 2005, p. 16). In a survey conducted by CIEM in 2008, the majority of general education level completed by owners/managers is lower secondary (55%) and professional education level by elementary worker (22.6%). Only 19.8% surveyed owners/managers completed college/university study.

However, the most important factor that impede the performance of SMEs in Vietnam is the lack of capital. SMEs are generally considered as riskier than large firms because they have lower survival rate, larger variance of profitability and growth (OECD, 1998). As a result, they often suffer from credit rationing or higher loan interest rate. In Vietnam, according to a recent research conducted by VCCI, 75% of the SMEs would like to seek bank loans but only about 30% succeeded. Not only is the lending procedure too complicated but the interest rate charged to SMEs is also exorbitantly high. SMEs in Vietnam are in greater disadvantage compare to large enterprise in obtaining capital. For example, the average capital per enterprise was 49

VND billion in 2011 for all enterprises (and 1582 VND billion for state-owned enterprises which are mostly large enterprises) but it was only 18 VND billion for SMEs alone (GSO, 2013).

Previous literature suggests that the determinants of SMEs accessibility to finance can be classified into four groups of variables: owner/manager characteristics; SMEs characteristics; creditworthiness; and network.

**1.1. Owner/manager characteristics.** Small scale firms are mostly managed by owners/managers and their performance depends largely on the management ability of the owners/managers. Therefore, it is no surprise that the owners/managers' education and experience have been found to be strong determinants of credit accessibility. A large number of studies have found owner's education and experience to enhance firm credit access positively, including Coleman (2004b), Fatoki & Odeyemi (2010), Irwin & Scott (2010), Fatoki & Asah (2011), Nofsinger and Wang (2011), and Osei-Assibey, Bokpin & Twerefou (2012). Research on the impact of owners/managers' education and experience on accessibility to finance of SMEs in Vietnam, however, showed mixed results. Rand (2007) found that owner's education is significant but negatively related to credit accessibility because owners with better knowledge are more likely to know if their application will be rejected. Therefore, they choose not to apply for credit in the first place. This observation is consistent with Coleman's (2004a) study. In contrast, Le, Sundar & Nguyen (2006) study showed educational positive influence the owner's probability of obtaining bank loans. Interestingly, this relationship is non-significant in Thanh, Cuong, Dung & Chieu (2011) study.

A set of owners/managers' demographic characteristics such as gender, age, and marital status is often added as controlled variables. In terms of the owner's age, younger owners are considered less risk averse so they are more willing to borrow externally (Coleman, 2004b; Vos, Yeh, Carter & Tagg, 2007). However, owner/manager's age represents experience so young owners might find it harder to borrow formally (Akoten, Sawada & Otsuka, 2006) and they might not apply for bank loans because they assume their application would be rejected (Coleman, 2004a). Second, the literature on gender and entrepreneur revealed that women are likely to face significantly more difficulty in obtaining finance than men. They face higher probability of being credit rationed (Drakos & Giannakopoulos, 2011; Muravyev, Talavera, & Schäfer, 2009), pay higher interest rate (Muravyev et al., 2009), obtain less amount of the loans to start their business and use less institutional finance (Sara & Peter, 1998) but more informal/microfinance (Akoten et al., 2006). On the other hand, some studies claimed that women in

the business world are better educated and more talented than men so they can borrow more from formal sources (Yaldiz, Altunbas & Bazzana, 2011) or there is no gender difference in financial accessibility (Fatoki & Asah, 2011; Harrison & Mason, 2007) and in some studies, women were found to have an advantage in obtaining formal loans and rely less on informal loans. With regards to the SMEs in Vietnam, Rand's (2007) finding is consistent with the former view, while Thanh et al. (2011) supports the latter.

**1.2. SMEs characteristics.** SMEs share some common characteristics that differentiate their credit accessibility from large firms. The first and most frequently cited characteristic is firm size (which is often proxied by number of employees or sales). SMEs are characterized as the "missing middle" because on one hand, for banks, the amount lend to SMEs is too small to offset transaction and screening cost (Shinozaki, 2012). On the other hand, the loan might be too large for the borrowers to borrow from microfinance institutions (DALBERG, 2011). Hernández-Cánovas and Martínez-Solano's (2010) study reported that small sized enterprises bear higher cost of debt than medium sized enterprises because asymmetric information is reduced when the firms become larger. Drakos & Giannakopoulos (2011) argued that firm size can signal loan repayment ability; therefore, small firms are more likely to be credit rationed. Similarly, in a study of credit constraints in four African countries, Bigsten et al. (2003) suggested that firm size is a strong determinant in obtaining credit with the probability of success of 31%, 20%, and 13% for micro, small, and medium sized firms, respectively, as compared to large firms. Another study by Hainz and Nabokin (2013) that covers 23 countries in the EU and Asia test the determinants of access to credit across different firm sizes. The authors' result suggest that small firms have 6 percent point lower probability of demanding external finance than larger firms, indicating that small firms rely more on internal finance or have less credit demand than large firms. For the case of Vietnam, the current literature supports that firm size is positively associated with accessibility to bank loan (Le, 2012; Malesky & Taussig, 2009; Nguyen & Ramachandran, 2006; Rand, 2007) and negatively with interest rate (Menkhoff, Neuberger, & Suwanaporn, 2006).

Together with firm size, firm age has also been widely recognized as a significant determinant of accessibility to financing. Young firms often face difficulties in obtaining external finance because of informational disparities (Hernández-Cánovas & Martínez-Solano, 2010; Kira & He, 2012), more difficulty to monitor (Byiers, Rand, Tarp, & Bentzen, 2010) and inexperience (Akoten et al., 2006). Result on the impact of firm age on credit accessibility for SMEs in Vietnam is mixed. Thanh et al. (2011) study showed a positive

relationship while it was non-significant in Malesky & Taussig (2009) study. In terms of ownership types, government-owned firms are believed to be able to access finance from development banks or public-owned banks (Beck, Demirgüç-Kunt, & Maksimovic, 2008), face fewer problem with collateral requirement and paperwork bureaucracy (Demirgüç-Kunt & Levine, 2005) whereas private-owned firms are more likely to be credit rationed (Drakos & Giannakopoulos, 2011). Private enterprises face significant constraints in terms of collateral requirement to access credit. In addition to firm size, age and ownership types, previous studies also include sector and export as dummy variables to test whether there is a difference in accessibility to finance in different sectors of the economy and between export and non-export enterprises. For instance, Kira & He (2012) indicated that firms in the industry sector can obtain debt finance much easier than other sectors in Tanzania. In contrast, Mulaga's (2013) study indicated that manufacturing sector is more likely to use external finance than services and industry sector in Malawi. Beck et al. (2008), however, found no difference in debt financing across sectors. With regard to SMEs in Vietnam, Le (2012) found that firms in the service sector, followed by some manufacturing industries have a higher probability to succeed in obtaining bank loans. However, Vietnamese firms participating in export experienced difficulties to access credit as suggested in Thanh, Cuong, Dung, & Chieu's (2011) study.

**1.3. Creditworthiness.** Collateral serves as a means to reduce asymmetric information and moral hazard in asset-based lending (Mac AnBhaird & Lucey, 2010). Bester (1987) argued that collateral signals firm's level of risk because only low risk borrowers are willing to pledge high amount of collateral. The lack of collateral is among the major barrier to access bank finance (Shinozaki, 2012). Empirical studies have proven that collateral increase accessibility to institutional finance (Fatoki & Asah, 2011; Fatoki & Odeyemi, 2010; Kira & He, 2012), long term debt finance (Bougheas, Mizen, & Yalcin, 2006), and also credit access in general (Malesky & Taussig, 2009). Malesky & Taussig (2009) used Certificate of Land Use Right (CLUR) in Vietnam as a proxy for collateral and found that having CLUR indeed increases the ability to access to credit. Rand (2007) found opposing result whereby collateral is significant and positively correlated to interest rate, suggesting the influence of "policy lending" in the country credit market.

In addition to collateral, quality of financial information disclosed by firms is also one of the important determinants of accessibility to finance. According to Timo Baas Mechthild (2006), SMEs do not have much incentive to invest in publishing detailed finan-



cial statements because legal accounting requirements are low; hence, banks are not willing to lend to them. However, financial statements issued by firms can be used to evaluate future performance and therefore determine whether borrowers are able to repay the interest and principal (Kira & He, 2012, p. 115; Mula-ga, 2013; Osei-Assibey et al., 2012; Safavian & Wimpey, 2007). Furthermore, Drakos & Giannakopoulos (2011) added that externally audited financial statement decreases the likelihood of being credit rationed which supports Shinozaki's (2012) result. Le (2012) found that for small businesses in Vietnam, having financial statement audited is beneficial to obtain bank loans but it is not significant for larger enterprises.

**1.4. Networks.** Networks play a crucial role, especially in relationship lending. Study on relationship lending emphasizes the role of trust on accessibility to credit in SMEs. According to Moro & Fink (2013), loan manager's trust on firm will reduce credit constraints and increase accessibility to credits (Atieno, 2009). It is widely agreed that networks are considered as an effective tool to overcome asymmetric information (Dabla-Norris & Koeda, 2008; Fraser, Bhaumik, & Wright, 2013; Safavian & Wimpey, 2007; Shane & Cable, 2002). Long term relationships enable creditors to punish firms using fund ineffectively by cutting off future loan (Fraser et al., 2013). It also helps firms to borrow at lower rates and pledge less collateral (Berger & Udell, 1995; Degryse & Van Cayseele, 2000; Uzzi, 1999). Hernández-Cánovas and Martínez-Solano (2010) found that relationships with banks help European SMEs access debt more easily but SMEs bear higher interest rate if they keep relationship with only one bank rather than two banks.

However, networks or relationships appear to be more important to obtain informal finance and venture capital. Unlike formal creditors, informal creditors do not rely much on official information disclosed by firms such as financial statements or business plans but on informal information acquired through business relationship with borrowers (Dabla-Norris & Koeda, 2008; Safavian & Wimpey, 2007). Moreover, networks with lenders, connections with other enterprises and business associations also help to promote access to financial services (Atieno, 2009).

Few studies on SMEs in Vietnam have attempted to understand the relationship between network and accessibility to bank finance. Specifically, Nguyen & Ramachandran (2006) and Rand (2007) found that firms having borrowing relationship with banks previously are able to borrow at lower interest rate and a higher probability to obtain loan again. In Le, Sundar, & Nguyen's (2006, pp. 222-223) study, firms that have networks with managers of other firms, with friends and relatives find it easier to borrow from banks. On the other hand, networks with government officials have negative effect on accessibility to bank

finance, suggesting that these firms can access to aid money and government official programs. This finding, however, contradicts Malesky & Taussig's (2009) result where political connections strongly increased the probability of firms to obtain bank loans.

## 2. Methodology

**2.1. Data.** Data for analysis were collected from a survey of 700 SMEs in Hanoi in June, 2013. The questionnaire was pretested on a random sample of 10 SME's owners/managers in Hanoi. The respondents were encouraged to comment on any questions or statements they thought were ambiguous or unclear. Some minor wording modifications to the questionnaire were made as a result of this process. The final version of the questionnaire was then delivered to SMEs premises. SMEs owners or financial managers were asked to fill the questionnaire. Of the total 700 questionnaires that were delivered, 487 returned responses were usable.

Of the total 487 responses, 211 SMEs borrowed at least a loan while 276 SMEs did not borrow in 2012. However, some SMEs did not borrow simply because they did not need to (i.e., they had enough capital). Therefore, we excluded 158 SMEs that did not borrow from the model. The final data set for the model includes 211 SMEs that borrowed and 117 SMEs that were in need of a loan but did not get one, yielding a total of 328 observations.

**2.1.1. Empirical models.** For many commodities and services, the individual's choice is discrete and traditional demand theory has to be modified to analyze such a choice (Ben-Akiva and Lerman, 1985; Kim, Widdows and Yilmazer, 2005). Models for determining discrete choice such as whether an individual purchase a house or does not purchase a house is known as a qualitative choice model. If the random term is assumed to have a logistic distribution, then the decision to purchase or not purchase a house represents a standard binary logit model. However, if it is assumed that the random term is normally distributed, then the model becomes the binary probit model (Maddala, 1993; Greene, 2000).

The logit model is applied in this study to determine what factors affect the SMEs ability to access credit when they need to borrow (from any sources such as commercial banks, microfinance, friends/relatives, trade credit, etc.). Since the nature of the dependent variable (denoted as borrow versus not borrow) is binary, logistic estimation is used. In this study, we choose logit model because of its simplicity. The model is estimated by the maximum likelihood method used in the STATA software.

The parametric functional form of the logit model with the binary dependent variable can be written as follows:

$$\begin{aligned}
Borrow_{it} = & married_{it} + gender_{it} + age_{it} + bachelor_{it} + owner\_exp_{it} + firm\_age_{it} + size\ 2012_{it} + \\
& + sector\ 2_{it} + sector\ 3_{it} + export_{it} + combank\_nw_{it} + socbank\_nw_{it} + friend\_nw_{it} + \\
& + customer\_nw_{it} + acc\_book_{it} + \varepsilon_i.
\end{aligned}
\tag{1}$$

The discrete dependent variable, borrow is based on the question asked in the mail survey: “Did you borrow any loan in 2012?” The following factors such as marital status, age, gender, number of years in business, number of years business establishment, number of employees, types of economic sector, duration of loans, mode of loan payment, total value of loan, pur-

pose of loan, collateral, loan assistance, sources of loan, networks and accounting record book were hypothesized to influence the respondent’s decision to borrow. For example, as the respondent’s age increases, does the probability of borrowing decrease? The variables used in the empirical model are defined in Table 1.

Table 1. Variable description

Name	Description
<i>married</i>	Dummy variable taking value of 1 if owner is married, 0 otherwise
<i>gender</i>	Dummy variable taking value of 1 if owner is male, 0 otherwise
<i>age</i>	Dummy variable taking value of 1 if owner is younger than 40 and 0 otherwise
<i>bachelor</i>	Dummy variable taking value of 1 if owner has at least a bachelor degree or higher and 0 otherwise
<i>owner_exp</i>	Number of years owner has been doing business
<i>firm_age</i>	Number of years of establishment
<i>size2012</i>	Number of employees in 2012
<i>sector2</i>	Dummy variable taking value of 1 if SME is in manufacturing sector, 0 otherwise
<i>sector3</i>	Dummy variable taking value of 1 if SME is in service sector, 0 otherwise
<i>export</i>	Dummy variable taking value of 1 if the firm has direct export, 0 otherwise
<i>short_term</i>	Dummy variable taking value of 1 if the loan duration is less than 1 year, 0 otherwise
<i>long_term</i>	Dummy variable taking value of 1 if the loan duration is more than 5 years, 0 otherwise
<i>Monthly_paid</i>	Dummy variable taking value of 1 if interest payment mode is monthly, 0 otherwise
<i>loan_amount</i>	Total value of the loan in thousand VND
<i>loan_purpose</i>	Dummy variable taking value of 1 if the loan purpose is for a new investment project, 0 otherwise
<i>collateral</i>	Dummy variable taking value of 1 if the loan is collateralized, 0 otherwise
<i>loan_assist</i>	Dummy variable taking value of 1 if SMEs received any assistance to obtain the loan, 0 otherwise
<i>bank</i>	Dummy variable taking value of 1 if the loan borrowed from a commercial bank
<i>micro</i>	Dummy variable taking value of 1 if the loan borrowed from a microfinance institution
<i>moneylender</i>	Dummy variable taking value of 1 if the loan borrowed from a money lender
<i>friend</i>	Dummy variable taking value of 1 if the loan borrowed from friends/relatives
<i>combank_nw</i>	Network with commercial bank, on scale from 0 = "Not at all" to 5 = "very extensive"
<i>socbank_nw</i>	Network with social bank, on scale from 0 = "Not at all" to 5 = "very extensive"
<i>friend_nw</i>	Network with friends/relative, on scale from 0 = "Not at all" to 5 = "very extensive"
<i>customer_nw</i>	Network with customers, on scale from 0 = "Not at all" to 5 = "very extensive"
<i>acc_book</i>	Dummy variable taking value of 1 if SME has an accounting book, 0 otherwise

In Table 2, we report the pairwise correlation of the independent variables used in the model. The result shows no statistically significant correlation at more than 0.55. We also ran the model using Ordinary Least Square method to calculate variance inflation factor (VIF). The result (not reported here but available upon request) shows that the average VIF was 1.39 with the highest VIF being 1.77. Our model did not suffered from multicollinearity.

**2.2. Descriptive statistics.** Table 3 summarizes the mean statistics of the variables used in the model for all SMEs and the borrower/non-borrower group. The table shows the borrower group included significantly younger, more experienced owners, had longer years of establishment, larger size, more prevalent accounting book and more extensive networks with bank.

Table 2. Pairwise correlations

	<i>married</i>	<i>gender</i>	<i>age</i>	<i>bachelor</i>	<i>owner_exp</i>	<i>firm_age</i>	<i>size2012</i>	<i>sector2</i>	<i>sector3</i>	<i>export</i>	<i>Combank_nw</i>	<i>Socbank_nw</i>	<i>Friend_nw</i>	<i>Customer_nw</i>	<i>Acc_book</i>
<i>married</i>	1														
<i>gender</i>	-0.0121	1													
<i>age</i>	-0.176*	-0.138*	1												
<i>bachelor</i>	-0.0595	0.1650*	0.0003	1											
<i>owner_exp</i>	0.1196*	0.1439*	-0.517*	-0.0207	1										
<i>firm_age</i>	0.0718	0.0248	-0.345*	-0.0004	0.4632*	1									
<i>size2012</i>	0.0174	0.077	-0.0873	0.2045*	0.1979*	0.3800*	1								
<i>sector2</i>	0.0326	0.1063*	-0.096*	0.0987*	0.1350*	0.1522*	0.3160*	1							
<i>sector3</i>	-0.097*	0.0102	0.1320*	0.0185	-0.0525	-0.0854	-0.0816	-0.3919*	1						
<i>export</i>	-0.0042	0.0415	-0.0721	0.1759*	0.0688	0.1683*	0.1397*	0.1188*	-0.075	1					
<i>combank_nw</i>	0.0042	0.0799	-0.176*	0.2450*	0.1761*	0.1651*	0.2093*	0.1188*	-0.037	0.1641*	1				
<i>socbank_nw</i>	-0.0572	0.0373	-0.121*	0.1291*	0.1627*	0.0673	0.0882	0.0357	0.0155	0.1300*	0.5385*	1			
<i>friend_nw</i>	0.0301	0.0199	-0.0089	-0.0271	0.0259	-0.0806	-0.1298*	-0.0201	0.0293	-0.004	0.2264*	0.1981*	1		
<i>customer_nw</i>	-0.0123	0.06	-0.017	0.0347	0.0513	0.0222	-0.0309	-0.0384	0.0272	-0.045	0.2357*	0.2290*	0.3735*	1	
<i>acc_book</i>	0.0774	0.2371*	-0.124*	0.4129*	0.0754	0.0133	0.1720*	0.1090*	-0.061	0.1118*	0.1905*	0.1186*	-0.0523	-0.0084	1

Table 3. Descriptive statistics of the respondents

Variables	All	Borrowers	Non-borrowers	T-Test
<i>Observations</i>	328	211	117	
<i>married</i>	0.867	0.858	0.881	0.584
<i>gender</i>	0.726	0.763	0.661	-1.997**
<i>age</i>	0.605	0.517	0.763	4.4994***
<i>bachelor</i>	0.742	0.755	0.720	-0.6829
<i>owner_exp</i>	10.662	11.684	8.826	-4.3521***
<i>firm_age</i>	6.379	7.264	4.788	-4.1547***
<i>size2012</i>	28.170	37.033	12.246	-4.5551***
<i>sector2</i>	0.194	0.241	0.110	-2.8992***
<i>sector3</i>	0.418	0.368	0.508	2.4967***
<i>export</i>	0.100	0.104	0.093	-0.3054
<i>combank_nw</i>	2.458	2.835	1.780	-5.3276***
<i>socbank_nw</i>	1.242	1.344	1.059	-1.6675**
<i>friend_nw</i>	3.391	3.358	3.449	0.4693
<i>customer_nw</i>	3.861	3.840	3.898	0.2981
<i>acc_book</i>	0.882	0.910	0.831	-2.1628**

Note: T-statistic comparing the mean difference between borrower and non-borrower group. \*\*\*, \*\*, \* indicate significance level at 1%, 5%, 10%.

**2.3. Determinants of interest rate charged for the loan borrowed in 2012.** The interest rate model follows Petersen & Rajan (1994), Uzzi (1999), and Rand (2007) studies and is given as follows:

Where, indexes firm  $i$ .  $ITR_i$  = interest rate for the largest loan the firms borrowed in 2012.  $OWNER_i$  = a set of variables representing owner's/manager's characteristics, including age, gender, marital status, educational level, and experiences in doing business.  $FIRM_i$  = a set of variables representing the firm's characteristics, including firm age; number of employees (proxy for firm's size); a dummy variable for sector which equals to 1 if the firm is in either industry, trade or services, 0 otherwise; a dummy variable equals to 1 if firm exports, 0 otherwise.  $LOAN_i$  = a set of variables representing loan characteristics, including collateral dummy which equals to 1 if the loan required collateral and 0 otherwise; amount of the loan; duration of the loan; a dummy variable which equals to 1 if the mode of interest payment was monthly; and a dummy which equals to 1 if the loan purpose was to finance new investment project.  $RELATION_i$  = a dummy which equals to 1 if SMEs received any assistance to obtain the loan and 0 otherwise.  $SOURCE_i$  = a set of dummy variables representing sources of finance, including bank finance, microfinance, money lenders, friends/relatives, and others,  $e_i$  = error term.

The mean statistics of the SMEs largest loan borrowed in 2012 classified by sources of financing is reported in Table 4. The table clearly displays a large variance

in the interest rate charged by different lenders with the highest cost from private money lender and the lowest from friends/relatives. The difference between the commercial bank and microfinance loan interest rate is marginal. In terms of loan amount, commercial banks were the biggest lenders, followed by private money lenders. The mean of all microfinance loans was very high but it was caused by one outlier, i.e. one state-owned SME was able to borrow up to 90 billion VND from microfinance institutions. Interestingly, none of the loans borrowed from friends/relatives required collateral while the percentage of collateralized loans was 90% for commercial banks and 75% for microfinance. In addition, commercial bank loan required the most assistance to obtain (42.8%). The mode of interest payment variable indicates that paying loan interest every month is the main method (68.5% for commercial bank, 75% for microfinance, 80% for private money lender, and 53.8% friends/relative loans).

Finally, in terms of the length of loans, Table 4 shows that most of the loans were made in short term or medium term across different lenders, especially from the informal sources. For example, 80% of the loans provided by private money lenders and 64.3% from friends/relatives were short term. For commercial bank loans, 48% was short term and 42.8% was medium term. The microfinance loan is a special case in which medium (41.7%) and long terms were dominant (33.3%).

Table 4. Mean statistics of the largest loan characteristics

	Commercial banks	Micro finance	Private money lenders	Friends/relatives
Interest rate	14.992	14.167	21.250	8.125
Short_term	0.480	0.250	0.80	0.643
Medium term	0.428	0.417	0.2	0.25
Long_term	0.092	0.333	0	0.107
monthly_paid	0.684	0.750	0.80	0.538
loan_purpose	0.289	0.250	0.40	0.107
loan_amount	4.434.852.0	385.273.73	1.288.000.0	742.857.1
collateral	0.901	0.750	0.500	0
loan_assist	0.428	0.250	0.200	0.393
Observations	152	12	10	28
Percent	72.04	5.69	4.74	13.27

Note: Short term ( $\leq 1$  year); medium term (1-5 years); long term ( $> 5$  years).

### 3. Empirical results

#### 3.1. Determinants of SMEs credit accessibility

Result of the logistic estimation for the determinants of credit accessibility for SMEs and marginal effect is presented in Table 5. The statisti-

cally significant factors affecting the SMEs' ability to borrow include gender and education level of the owners/managers, firm size, sector, and network with banks and customers.

Table 5. Result of the logistic estimation of credit accessibility determinants

Borrow	Coefficient	Robust standart. error.	Marginal effect dy/dx
Owner characteristics			
age	-0.355	0.331	-0.064 <sup>d</sup>



Table 5 (cont.). Result of the logistic estimation of credit accessibility determinants

Borrow	Coefficient	Robust standart. error.	Marginal effect dy/dx
<i>gender</i>	0.544*	0.298	0.106 <sup>d</sup>
<i>married</i>	-0.619	0.419	-0.100 <sup>d</sup>
<i>bachelor</i>	-0.775**	0.354	-0.128 <sup>d</sup>
<i>owner_exp</i>	0.006	0.035	0.001
SMEs Characteristics			
<i>firm_age</i>	0.066	0.050	0.012
<i>size2012</i>	0.046***	0.015	0.008
<i>sector2</i>	-0.281	0.495	-0.054 <sup>d</sup>
<i>sector3</i>	-0.487*	0.289	-0.091 <sup>d</sup>
<i>export</i>	-0.511	0.463	-0.103 <sup>d</sup>
Networks			
<i>combank_nw</i>	0.380***	0.096	0.070
<i>socbank_nw</i>	-0.149	0.109	-0.027
<i>friend_nw</i>	0.001	0.090	0.000
<i>customer_nw</i>	-0.158*	0.087	-0.029
Creditworthiness			
<i>acc_book</i>	0.102	0.458	0.019 <sup>d</sup>
<i>_cons</i>	0.394	0.796	
Number of observations	329		
Pseudo R2	0.2044		

Note: \*\*\*, \*\*, \* indicate significance level at 1%, 5%, 10%. Marginal effects were calculated at the mean (<sup>d</sup>) dy/dx is for discrete change of dummy variable from 0 to 1.

Table 5 shows gender has a significant and positive effect on credit access. Being a male owner increases the probability of obtaining a loan by 10.6%. Our finding is similar with previous studies that revealed female-owned businesses have higher probability of being credit rationed (Drakos & Giannakopoulos, 2011; Muravyev et al., 2009), obtaining less amount of the loans to start their business, using less institutional finance (Sara & Peter, 1998) and more informal/micro finance (Akoten et al., 2006). Our result also supports Rand's (2007) finding that Vietnamese female owned SMEs are more credit constraint than their male counterparts.

The education variable yields somewhat surprising result. The result suggests that, the owner with a bachelor degree or higher had 12.8% lower chance of borrowing a loan than he/she would otherwise have with lower educational level. The education variable is negatively related to credit accessibility which contradicts to what is reported in the literature (Coleman, 2004b; Fatoki & Asah, 2011; Fatoki & Odeyemi, 2010; Nofsinger & Wang, 2011; Osei-Assibey et al., 2012). Our result contradicts with Le, Sundar, & Nguyen (2006) study that showed positive educational influence the owner's probability of obtaining bank loans. Thanh, Cuong, Dung, & Chieu's (2011) study showed non-significant relationship between owner education and credit accessibility. However, our result strongly supports Coleman (2004b) and Rand's (2007) finding who explained that owners with better knowledge are more likely to know if their loan appli-

cation will be rejected. Therefore, they choose not to apply in the first place.

Table 5 also shows that higher educated owners/managers are not likely to anticipate difficulties in obtaining a loan (such as rejection of application, complicated government regulations or administrative difficulties in processing the loan) but they are also more cautious in making business decisions, including whether to borrow or not to borrow. About 38% of the surveyed SMEs did not borrow because they either anticipated complicated government regulations or administrative difficulties in processing the loans which increase the opportunity costs of obtaining a loan.

The owner's age coefficient is negative which supports Coleman (2004b) and Vos et al. (2007) studies that younger owners are less risk averse so they are more willing to borrow. Similarly, the marital status and owner experience coefficients are not statistically significant.

With regard to SMEs characteristic variables, firm size and sector are significant determinants of credit accessibility. The firm size coefficient is positively related to the probability to borrow. Our estimation suggests that an additional employee added to the firm increases the probability of the firm to borrow a loan by 0.8%. This result is similar to other studies in developing countries such as China (Okura, 2008), Malawi (Mulaga, 2013), South Africa (Fatoki & Odeyemi, 2010), Kenya (Biggs, Raturi, & Srivastava, 2002),

India (Allen, Chakrabarti, De, Qian, & Qian, 2012), Mozambique (Byiers et al., 2010), Tanzania (Kira & He, 2012), the UK and US (Vos et al., 2007), and Vietnam (Le, 2012; Malesky & Taussig, 2009; Nguyen & Ramachandran, 2006; Rand, 2007). In terms of sector, firms in the service sector have lower probability to borrow by 9% as compared to industry and trade. This is common since manufacturing is provided more favorable and incentive treatments from the Vietnamese government toward an industrialized economy. The accounting book availability coefficient (used as proxy for creditworthiness) exhibited the expected sign but was not statistically significant.

Table 5 also indicates that network with bank officials is beneficial to obtain a loan. An increase in one level of network with bank officials increased the probability to obtain a loan by 7% and is statistically significant at 1%. Network with social bank official's variable is not statistically significant, indicating that microfinance is not popular in the urban area. The result reveals that a more extensive network with customers reduces the probability to obtain a loan. It is understandable that when a firm can utilize its network with customers, the business is more likely to be successful and therefore it can rely more on retain earnings. Network with friends is also positively related to borrowing but this coefficient is not statistically significant. In summary, there are only two networks that matter to SMEs credit accessibility: network with bank officials and network with customers. The first network improves their chance to get a loan and the second lessens their debt incidence.

### 3.2. Determinants of the SMEs loan interest rate.

Result from the OLS estimation for the determinants of SMEs loan interest rate is shown in Table 6. The table presents the model with different set of variables but the results do not vary significantly, illustrating that it does not suffer from multicollinearity. Using Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC), the result exhibits the most appropriate predictor subset. The result suggests that the important determinants of loan interest rate are loan characteristics, relationship, and source of the loan.

Table 6 shows the firm age coefficient is significant and negatively related to interest rate. This finding is consistent with Diamond (1989) theory of reputation acquisition effect as firms grow older. It also confirms the downward sloping interest rate curve as a function of firm age in Sakai, Uesugi, and Watanabe (2010) empirical test of firms in Japan. The result also shows that SMEs in manufacturing sector paid higher interest rate than services, trade and agriculture sector. This seems somewhat contradictory when SMEs in manufacturing find it easier to obtain loans than other enter

prises in services and trade but paid higher interest rate. A possible explanation is that the privilege in obtaining bank loan is offset by the higher cost of commercial bank loans as compared to lower cost sources such as friends and relatives or trade credits. The result further reveals that 76.5% industrial SMEs in our sample chose commercial bank loan for their largest loan compared to 64% SMEs in the service sector. Furthermore, of the total number of SMEs that borrowed from friends or relative, only 14% are from manufacturing sector while the remaining 86% are from services or trade sector. Other firm characteristics variables, including number of employees and export participation are not statistically significant.

In terms of the loan characteristic, the result shows mode of interest payment is not a statistically significant determinant of interest rate but duration of the loan, loan amount and purpose of the loan are important. First, duration of the loan is negatively related to the interest rate with long term (more than 5 years) loan being significantly cheaper than short term loan (less than 5 years). This is because interest rate was very volatile and unpredictable in 2012. The financial market in Vietnam is heavily regulated and controlled by the government and the market interest rate varies upon government policies on prime rates, discount rate, and refinancing rate. In 2012 alone, the State Bank of Vietnam changed these rates six times, cutting the refinancing rate from 15% per year at the beginning to 9% by the end of the year and the discount rate from 12% to 7%. It is the declining interest rate set by the government over a short period of time that creates a falling interest rate expectation, making the long term interest rate cheaper than the short term. Secondly, as expected, the loan amount is positively associated with the interest rate charged. This is statistically significant at 1% level. In addition, the loan to finance new investment project has higher interest rate than other purposes because investing in a new project is considered riskier than other activities. This is possible from our sample survey where 40% of the loans borrowed from private money lenders were for new investment project while only less than 29% of commercial bank and other source loans were for new investment purposes. Interestingly, our finding differs from Rand's (2007) study in which the author finds a positive relationship between collateral and cost of capital for SMEs in Vietnam. A possible explanation for the difference in our result is the difference in the target SMEs population. Our study concentrates on SMEs in urban area, while majority of SMEs that accessed credit in Rand's (2007) study came from rural area where policy lending (i.e. the government directs state-owned commercial banks to lend to rural SMEs without or with very low collateral requirement) is popular.

The sources of financing and relationship variables yields expected result. The most expensive source of financing is from private money lender, followed by commercial bank loan and microfinance. Borrowing

from friends or relative is least costly but the variable is not statistically significant. SMEs that received assistance in obtaining the loan also paid lower interest rate. Our findings are similar to Rand (2007).

Table 6. Determinants of interest rate charged on SMEs loan

Variables	(1)		(2)		(3)		(4)	
Owner characteristics								
<i>married</i>	1.108	(1.019)						
<i>gender</i>	0.501	(0.669)	0.432	(0.664)				
<i>age</i>	0.460	(0.800)	0.341	(0.792)	0.328	(0.790)		
<i>bachelor</i>	1.176	(0.858)	1.136	(0.852)	1.218	(0.869)	1.225	(0.860)
<i>owner_exp</i>	-0.0408	(0.059)	-0.0387	(0.059)	-0.0388	(0.059)	-0.038	(0.050)
SMEs characteristics								
<i>firm_age</i>	-0.124**	(0.0610)	-0.123**	(0.062)	-0.124**	(0.0621)	-0.137**	(0.0617)
<i>size2012</i>	0.0062	(0.0045)	0.0062	(0.0045)	0.006	(0.0047)	0.009*	(0.0048)
<i>sector2</i>	1.523*	(0.873)	1.549*	(0.866)	1.609*	(0.868)	1.731**	(0.865)
<i>sector3</i>	1.142	(0.739)	1.050	(0.745)	1.080	(0.752)	1.098	(0.734)
<i>export</i>	1.021	(0.968)	0.863	(0.977)	0.832	(0.976)	0.820	(0.977)
Loan characteristics								
<i>short_term</i>	0.572	(0.705)	0.522	(0.711)	0.547	(0.711)	0.536	(0.715)
<i>long_term</i>	-1.485*	(0.826)	-1.505*	(0.841)	-1.478*	(0.841)	-1.469*	(0.840)
<i>monthly_paid</i>	-0.035	(0.737)	-0.0099	(0.747)	-0.041	(0.744)	0.119	(0.745)
<i>loan_amount</i>	1.71e-08***	(4.54e-09)	1.83e-08***	(4.56e-09)	1.81e-08***	(4.58e-09)	1.63e-08***	(4.70e-09)
<i>loan_purpose</i>	1.686**	(0.699)	1.571**	(0.707)	1.572**	(0.706)	1.434**	(0.712)
<i>collateral</i>	-0.937	(1.134)	-1.004	(1.144)	-0.840	(1.129)	-0.999	(1.133)
<i>Relationship</i>								
<i>loan_assist</i>	-1.728**	(0.671)	-1.823***	(0.659)	-1.815***	(0.655)	-1.772***	(0.646)
Sources of financing								
<i>bank</i>	5.000***	(1.569)	5.202***	(1.655)	5.060***	(1.626)	3.911**	(1.892)
<i>micro</i>	4.259**	(1.809)	4.471**	(1.869)	4.387**	(1.852)	3.231	(2.089)
<i>moneylender</i>	9.937***	(2.152)	10.08***	(2.182)	10.01***	(2.160)	8.925***	(2.304)
<i>friend</i>	-1.744	(1.840)	-1.723	(1.903)	-1.751	(1.891)	-2.882	(2.103)
<i>Constant</i>	8.636***	(2.117)	9.701***	(1.796)	9.964***	(1.653)	11.26***	(1.693)
<i>Observations</i>	206		206		206		207	
<i>R-squared</i>	0.420		0.415		0.414		0.406	
<i>AIC</i>	1196.651		1196.334		1194.699		1203.758	
<i>BIC</i>	1269.864		1266.219		1261.257		1266.988	

Note: robust standard error in parenthesis. \*\*\*, \*\*, \* indicate significance level at 1%, 5%, 10%.

## Conclusions

This study identifies the determinants of credit accessibility and loan interest rate for SMEs in Vietnam in 2012. Owner characteristics, in particular, educational level and gender remain the most important factors in determining the access to credit, followed by SMEs relationship with banks and customers. Further, the results revealed that smaller sized enterprises have less access to credit. With regards to the loan interest rate, the owner characteristics variables are non-significant. The most expensive source of financing is from private money lender, followed by commercial bank loan and microfinance. SMEs borrowed at lower rate if they operate longer in the market, receive assistance from government or if the loan is long term. On the other hand, interest rate is higher when the loan

amount is larger, the purpose of loan is for new investment projects, or if SMEs were in manufacturing or construction sector.

The study results recommend that network, relationship and connections still have great effect over the SMEs credit market in Vietnam and there persist disadvantages for small sized and female-owned enterprises in obtaining a loan. Therefore, any policy that targets to improve SMEs credit accessibility should pay more attention to these two groups of borrowers. In addition, a stable monetary policy is necessary to enable SMEs credit market to be driven by market factors (such as creditworthiness) rather than non-market factors such as relationships, sector or owner's demographic characteristics.

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