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## Credit accessibility and small and medium sized enterprises growth in Vietnam

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# Credit accessibility and small and medium sized enterprises growth in Vietnam

## Abstract

Small and medium sized enterprises (SMEs) have been highly conducive to economic development in Vietnam. SMEs are a mean of income generation, job creation, poverty reduction, and government revenue contribution, etc. However, SMEs have lagged far behind other business sectors in terms of performance. It is claimed that one of the major reasons is their inability to access credits. This study empirically tests the impact of access to different sources of financing on SMEs' growth. Primary data was obtained from a survey of 487 SMEs in Hanoi in June 2013. The empirical models include Ordinary Least Square (OLS) estimation and Heckman Two Stage Procedure model to account for endogeneity issue. The models reject the claim that the inability to access credit adversely affects SMEs growth. The result is consistent in both OLS model and the Heckman Two Stage Procedure model. Furthermore, the results from the Heckman Two Stage Procedure model indicated that there is a remarkable difference in the growing pattern of externally and internally financed group. The fastest growing SMEs are those who did not borrow externally and their growth strategy relies on the owner's human capital (i.e. young and well-educated), direct export and network developed with customers. On the other hand, the SMEs group that obtained external finance grows faster as their enterprise size increases and they keep financial records.

**JEL classifications:** L25, D920

**Keywords:** SMEs, SMEs growth, finance and firm growth, credit accessibility, Vietnam

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## 1 Introduction

Small and Medium Sized Enterprises (SMEs) represented 98% of the total enterprises in Vietnam (GSO, 2013). The sector contributed about 48% to the national GDP and has been the main source of employment generation with half million of new jobs each year (MPI, 2012). Despite their dominant number, SMEs did not perform well as expected. They seem to lag far behind other business sectors. They accounted for only 43.9% total gross revenue of all enterprises and 13.6% total profit before tax (GSO, 2013) - a very modest contribution given their dominance in the economy. More importantly, according to MPI (2012), profitability indicators of SMEs fell below the entire business sector<sup>1</sup> and have decreased over the years. For instance, return on equity of SMEs was 2.57% in 2007, equivalent to only half of the entire business sector and decreased further in 2008 and 2009 to 1.87%.

The poor performance of SMEs suggests SMEs confront many obstacles such as credit accessibility which has long been discussed as one of the main challenges. SMEs often suffer from credit rationing or higher interest rate because of their character as “the missing middle”. According to Vietnam General Statistics Office (GSO) there were 60,737 enterprises nationwide closed down in 2013, an increase of 11.9% compared to 2012. Most of them were SMEs and there is a popular claim that one of the major reasons was because of their inability to access to credits. However, it is questionable whether access to credit has a real effect on SMEs growth in Vietnam. Very few up-to-date studies have empirically addressed this issue with the exceptions of Malesky & Taussig (2009) and Shinozaki (2012). Malesky and Taussig’s (2009) study finds no significant relationship between bank finance and firm profitability. The authors explain that bank lending in Vietnam based too much on political connections so credits may not go to profitable firms. In addition, the most profitable firms do not rely on bank finance but retained earnings. Shinozak (2012) study, in contrast, found a positive relationship between bank lending and sales growth of SMEs. The results of these studies might be bias because of potential endogeneity problem that may arise since the financing decision is endogenously determined by the firm (Allen, Chakrabarti, De, Qian, & Qian, 2012; Ayyagari, Demirgüç-Kunt, & Maksimovic, 2010; Rahaman, 2011). This study attempts to examine the relationship between credit accessibility and SMEs growth that accounts for the endogeneity problem.

The rest of the paper is organized as follows: Section 2 provides a review of recent studies on credit accessibility and SMEs growth. Section 3 presents the method used in this research. Section 4 discusses the results and implications. Finally, Section 5 concludes the study.

## 2 Literature review

Credit is considered a factor of production. Access to credits allow SMEs to utilize productive assets to enhance their productivity and economy of scale (Kira & He, 2012). As suggested in DALBERG’s (2011) report, access to finance encourages market entry, facilitates growth, reduce risks, fosters innovation and entrepreneurial activity. However, empirical studies worldwide show mixed results. At cross-country level, Wagenvoort (2003) estimated the growth sensitivity

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<sup>1</sup> Business sector includes large enterprises, SMEs, and individual business establishments.

cash flow of enterprises in 14 European countries over 1996 – 2000 period by Ordinary Least Squares (OLS) method and find that finance constraints limit the growth potential of SMEs. Beck, Demirgüç-Kunt, & Maksimovic's (2005) study on firms in 54 countries confirms that financial constraints limit firm growth, especially small firms. At country level, Rahaman (2011) estimates that a 10% increase in bank credit result in an 18.14% increase in growth of the sample firms in Ireland and the UK. Khandker, Samad, and Ali (2013) test the impact of access to finance on microenterprise growth and profitability in Bangladesh using a fixed-effect model. Their results suggest that credit constraints negatively affect microenterprise's profit margin more severely than other types of constraints (such as transportation, lack of demand, etc.). In addition, enterprises that borrowed from money lenders to start their business have significantly lower profit than borrowing from other sources. Ayyagari, Demirgüç-Kunt, & Maksimovic's (2010) study in China revealed that firms borrowed from banks or use retained earnings grow faster than firms borrowing from informal sources. Similar findings were documented for Kenya (Akoten, Sawada, & Otsuka, 2006; Atieno, 2009) and Indonesia (Shinozaki, 2012). However, Allen et al. (2012) find that firms in India with access to bank or market finance do not perform better than the others. Their argument is that emerging countries like India, firms prefer to use alternative finances rather than institutional finance to avoid any possible cost that might result from legal institutions and to adapt better with changes. Yiu, Su, and Xu (2012) assess the impact of alternative financing (underground finance and trade credits) on the performance of 284 private firms in 19 provinces in China. Their OLS and Two Stage Least Square estimation confirmed that alternative financing positively associates with firm performance. Therefore, informal finance is an important source of financing for private firm in transition economies where formal financing is not widely available.

### 3 Research method

#### 3.1 Empirical model

The base model to determine the impact of access to different sources of credit on SMEs' growth is given as follows:

$$GROWTH_i = \delta_0 + \delta_1 Z_i + \delta_{2j} CHOICE_{ij} + \varepsilon_i \quad (1)$$

Where:

$i$  indexes firm  $i$

$GROWTH$  measures firm's revenue growth rate during 2011 – 2012.

$Z_i$  is a set of exogenous observable characteristics of the owner and firm  $i$

$CHOICE_j$  is dummy variables which represents the financing strategy choice ( $j = \overline{1,4}$  representing four choices: formal, informal, both sources, or internal finance, respectively)

$\delta_0, \delta_1, \delta_{2j}$  are the parameters to be estimated,  $\varepsilon$  is the error term

### *The endogeneity issue in credit access*

This study investigates the impact of access to different sources of credits on SMEs growth. However, an OLS regression of *GROWTH* on *CHOICE<sub>j</sub>* might yield biased result because *CHOICE<sub>j</sub>* is possibly endogenously related to *GROWTH*. There are two possible sources of endogeneity. First, there is simultaneous causality between sources of financing and growth. For example, it is likely that SMEs that can obtain formal credits grow faster than the others (Ayyagari et al., 2010; Rahaman, 2011). However, SMEs that grow faster is also expected to have easier access to formal financing sources (Binks & Ennew, 1996). Second, since SMEs do not randomly choose their financing choice, the model might encounter sample selection bias. For instance, if the firms choose only formal source (*j*=1), the question of interest is whether this group of SMEs would have performed poorer had they used other sources (such as informal source, *j*=2). The simple approach in comparing the growth rate of formally financed SMEs with the growth rate of informally financed SMEs is not appropriate unless the strategy choice is exogenous, which is rarely the case in strategic management (Hamilton & Nickerson, 2003).

To overcome the endogeneity problem, the study applies the well-known Heckman (1979) Two-Stage Procedure with the extension from Lee (1982) for multiple strategy choice. Specifically, the procedure includes two steps. In the first step, a multinomial logistic regression is used to determine the financing choices. All exogenous variables that affect both financing choices and firm growth will be added in the regression model together with instrumental variables for financing choices. This step helps to construct the inverse Mills ratio terms (denoted as  $\lambda_j$ ,  $j = \overline{1,4}$ ). The second step is to augment equation (1) by including the appropriate inverse Mills ratio as the regressor to estimate the resulting model by OLS using each subset of the SMEs group corresponding to the financing choices. The equation is given as follows:

$$GROWTH_i = \delta_0 + \delta_1 Z_i + \delta_{2j} CHOICE_{ij} + \delta_{3j} \lambda_{ij} + \varepsilon_{ij} \quad (2)$$

As noted by Hamilton and Nickerson (2003), the success of the model depends on the availability of instrument variables. Therefore, it is essential to find variables that are correlated with financing choices but not growth. Ayyagari et al (2010) suggests that collateral and government help (i.e. government directs banks to lend to some firms) are valid instruments in their model to determine the impact of bank financing on firm performance in China. There is no empirical evidence on the role of finance sources on SMEs performance in Vietnam that takes into account the endogeneity problem, this study will attempt to use both of the instruments.

### 3.2 Data

Primary data was obtained 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 final version of the questionnaire was then administered to SMEs owners or financial managers who were asked to fill the questionnaire. Of the total 700 questionnaires that were administered, 487 returned

responses were usable yielding a response rate of 69.6%. Appendix 1 defines and summarizes the variables used in the study.

## 4 Results

### 4.1 Descriptive statistics

Table 1 summarizes basic statistics of the SMEs financing strategy and their growth status in 2012. From the table, 211 enterprises (or 43.33%) of the sample SMEs borrowed while 56.67% used internal financing. Among those who borrowed externally, 84% used either formal sources or both formal and informal sources. With regards to the SMEs sales growth, the table suggests that 52.98% of the SMEs exhibited a positive sale growth in 2012. In contrast, 16.22% SMEs' sales revenue remained unchanged and 30.8% experienced a decline. The strongest decrease in sale revenue growth is 80% whereas the highest growth rate is 300%. The average growth rate for the whole SMEs sample is 6.58%. T-test was conducted to test the difference between the mean growth of the SMEs group that borrow externally and the group that use internal financing. The result indicates that the difference is not statistically significant ( $t=0.146$ ).

**Table 1: Financing strategy and sale growth status of the sample SMEs in 2012**

Financing sources	Count	Percent (%)	Sale growth status	Count	Percent (%)
Formal financing	102	20.94	Increase	258	52.98
Informal financing	33	6.78	Decrease	150	30.8
Both sources	76	15.61	Stay the same	79	16.22
Internal financing	276	56.67			
<b>Total</b>	<b>487</b>	<b>100</b>	<b>Total</b>	<b>487</b>	<b>100</b>

Source: Author's survey data, 2013.

### 4.2 Empirical results

Equation (1) was first estimated using OLS method. The result is displayed in Table 2. The variables of interest is  $CHOICE_1$ ,  $CHOICE_2$ ,  $CHOICE_4$  ( $CHOICE_3$  is dropped from the estimation to avoid perfect colinearity). The coefficients associated with  $CHOICE_i$  are negative but not statistically significant. In other words, the OLS model suggests that financing choices do not affect the SMEs' growth. From the table, the significant factors affecting SMEs growth include owner younger than 30 years old ( $AGE1$ ), owner experience ( $OWNER\_EXP$ ), firm size ( $SIZE2012$ ), export participation ( $EXPORT$ ), and network with customers ( $CUSTOMER\_NW$ ).

**Table 2: Impact of credit access on SMEs growth – Ordinary Least Squares estimation model**

	Coefficient	RSE	t	P>t	[95% Conf. Interval]	
<b>Owner Characteristics</b>						
<i>AGE1</i>	12.84***	(4.297)	2.99	0.003	4.39	21.28
<i>AGE2</i>	-2.895	(3.664)	-0.79	0.430	-10.09	4.30
<i>BACHELOR</i>	1.692	(4.756)	0.36	0.722	-7.65	11.04
<i>OWNER_EXP</i>	-0.556**	(0.276)	-2.01	0.045	-1.09	-0.013
<b>SMEs Characteristics</b>						
<i>FIRM_AGE</i>	-0.133	(0.605)	-0.22	0.827	-1.32	1.06
<i>SIZE2012</i>	0.113***	(0.043)	2.60	0.01	0.027	0.19
<i>SECTOR2</i>	-0.822	(7.478)	-0.11	0.913	-15.51	13.87
<i>SECTOR3</i>	-0.842	(2.709)	-0.31	0.756	-6.16	4.48
<i>EXPORT</i>	11.63*	(5.932)	1.96	0.051	-0.03	23.28
<b>Network</b>						
<i>COMBANK_NW</i>	-0.293	(0.993)	-0.30	0.768	-2.24	1.66
<i>CUSTOMER_NW</i>	2.572***	(0.847)	3.04	0.003	0.91	4.24
<i>ACC_BOOK</i>	-2.523	(5.061)	-0.50	0.618	-12.46	7.42
<b>Financing Choice</b>						
<i>CHOICE1</i>	-2.616	(5.401)	-0.48	0.628	-13.23	7.99
<i>CHOICE3</i>	-2.226	(6.562)	-0.34	0.735	-15.12	10.67
<i>CHOICE4</i>	-3.261	(4.766)	-0.68	0.494	-12.62	6.10
Constant	3.084	(6.804)	0.450	0.650	-10.28	16.45
<b>Observations</b>	487					
<b>R-squared</b>	0.0773					

Notes: \*\*\*, \*\*, \* indicate significance level at 1%, 5%, 10%. RSE stands for Robust Standard Error

The Heckman Two Stage Procedure model was then applied to account for endogeneity issue. The result of the first stage (multinomial logistic estimation) to determine financing choices is provided in Appendix 3. Column (1), (2), and (3) of Appendix 3 show the likelihood of choosing either formal finance, informal finance or both sources relative to internal financing (i.e. internal financing is the base outcome). Column (4) shows the likelihood of choosing formal finance over informal finance (i.e. informal finance is the base outcome). Each column comprised of the model Relative Risk Ratio (RRR) and Robust Standard Error. Overall, the model fits the data well with 80.08% of correct prediction. The likelihood ratio test ( $\chi^2 = 553.24$ ) rejects the null hypothesis that all coefficients in the model are equal to zero. Therefore, the model can be used to explain the factors affecting financing choices for SMEs business operation. Appendix 3 clearly demonstrates that the availability of collateral (*COLLATERAL*) and assistance from government (*ASSIST*) are the strongest determinants of external financing. All of the variables are statistically significant at 1% level. This indicates that *COLLATERAL* and *ASSIST* can be used as the instrument variables in the model<sup>2</sup>.

<sup>2</sup> We also run Two Stage Least Square (2SLS) Model using these two instruments and test for the relevance and exogeneity conditions of the instruments. The F-statistics for instrument relevance and the Difference-in-Sargan statistic (or C-statistic) both satisfy the condition of instrument variables. These results are available upon request.



In the second stage, each subset of the SMEs group corresponding to the financing choice is estimated separately by OLS with the inverse Mill-ratio as one of the regressor (Table 3). In Table 3, the growth model of informally financed group is not reported as the number of observations is very small and the F-statistics is not statistically significant. As can be seen from the table, none of the  $\lambda$  coefficient is statistically different from 0. This suggests that the model does not suffer from endogeneity<sup>3</sup>. Therefore, result from the OLS model can be used to conclude that financing choice does not affect SMEs growth. The model, however, provides an interesting insight into the growth determinants of each SME group as classified by their financing choices.

Young owners (*AGE1*) have faster growing firms. The coefficient is positive in all three model and is statistically significant in model (1) and (3) at 10% and 5%, respectively. This suggests that in our sample, young owners are more proactive than the older owners.

The *BACHELOR* variable is not statistically significant when pooling all SMEs groups together in an OLS model (as in Table 2) but interesting story is revealed when estimating the model separately for each subgroup. While the coefficient is negative (but not significant) for the first two groups, it is positively significant in the third model. Alternatively, whether the respondents have a higher education degree or not does make any difference for those who borrow external finance while it is strongly associated with higher growth of those internally financed SMEs

In line with the previous finding that young owners lead to better enterprise growth, the owner experience variable (*OWNER\_EXP*) which is proxied by the number of years doing business has a negative effect in all models but is only statistically significant in model (3).

The *SIZE2012* variable suggests that firm size matters for the growth of externally-financed firms but not for the internally-financed group. Those who borrowed externally grow faster as their size increases but it is not the case for those who did not borrow from any external source.

The *SECTOR2* variable also exhibits interesting result. As suggested in the Multinomial Logistic model in Appendix 3, SMEs in manufacturing and construction are those who borrowed more than any other sector. However, they did not grow well, both *SECTOR2* coefficients in model (1) and (2) are negative and significant at 5% level. In contrast, those that did not rely on external financing could still grow or at least did not have negative growth rate. The coefficient in model (3) is positive but not statistically significant.

Participating in direct export proved to be the strongest determinants of growth for the SMEs group that did not borrow externally whereas it does not have a statistically significant impact on external borrowers. Similar pattern is observed for the customer network variable (*CUSTOMER\_NW*). On the other hand, having an accounting book is positively associated with higher growth rate for formal financing group but not for internally financed group. This indicates that the availability of financial statement can foster growth only for those who borrow from formal sources.

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<sup>3</sup> This is also consistent with the result when we attempt to run with the 2SLS model.

In summary, the analysis points out that access to different sources of credit do not affect SMEs growth. The result supports Allen et al. (2012) for the case of India but does not support Yiu et al. (2012) study on Chinese firms. With regard to SMEs in Vietnam in particular, the result is similar to Malesky & Taussig's (2009) study. Further, the evidence from Heckman Two Stage Procedure model indicated that there is a remarkable difference in the growing pattern of externally and internally financed group. The fastest growing SMEs are those who did not borrow externally and their growth strategy relies on the owner's human capital (i.e. young and well-educated), direct export and network developed with customers. On the other hand, the SMEs group that obtained external finance grow faster as their enterprise size increases and they keep financial records.

**Table 3: Impact of credit access on SMEs growth – a Heckman two stage procedure model**

Explanatory variables	(1)		(2)		(3)	
	Formally financed group		Both sources financed group		Internally financed group	
<b>Owner Characteristics</b>						
<i>AGE1</i>	25.43*	(12.98)	14.58	(11.38)	10.93**	(5.427)
<i>AGE2</i>	-1.604	(6.284)	10.42	(9.201)	-9.439	(5.733)
<i>BACHELOR</i>	-7.996	(5.493)	-21.75	(22.61)	13.38**	(6.213)
<i>OWNER_EXP</i>	-0.382	(0.590)	-0.347	(0.863)	-0.605*	(0.357)
<b>SMEs Characteristics</b>						
<i>FIRM_AGE</i>	-0.328	(0.404)	1.011	(0.887)	-0.774	(1.139)
<i>SIZE2012</i>	0.083*	(0.044)	0.160***	(0.055)	0.133	(0.096)
<i>SECTOR2</i>	-16.93**	(6.540)	-22.37**	(10.86)	20.16	(16.56)
<i>SECTOR3</i>	-7.876	(5.860)	-5.944	(13.04)	1.270	(3.558)
<i>EXPORT</i>	-3.210	(8.610)	3.673	(8.867)	22.73**	(9.115)
<b>Network</b>						
<i>COMBANK_NW</i>	-0.106	(2.016)	2.357	(2.940)	-1.761	(1.446)
<i>CUSTOMER_NW</i>	1.127	(1.220)	1.193	(2.434)	4.533***	(1.275)
<i>ACC_BOOK</i>	18.21**	(8.804)	30.80	(23.12)	-9.920*	(5.812)
$\lambda$	1.166	(4.292)	5.486	(11.91)	10.09	(26.44)
Constant	0.621	(11.54)	-35.20	(34.98)	-9.127	(8.940)
<b>Observations</b>	<b>102</b>		<b>76</b>		<b>276</b>	
<b>F-Statistics</b>	<b>1.83**</b>		<b>2.34***</b>		<b>7.15***</b>	
<b>R-squared</b>	<b>0.197</b>		<b>0.238</b>		<b>0.189</b>	

Notes: RSE in parenthesis. \*\*\*, \*\*, \* indicate significance level at 1%, 5%, 10%

## 5 Conclusion and implications

The paper examines the impact of credit accessibility on SMEs growth. The empirical evidence rejects the claim that the inability to access credit adversely affects SMEs growth. The result is consistent in both OLS model and the Heckman Two Stage Procedure model. Furthermore, the results from the Heckman Two Stage Procedure model indicated that there is a remarkable difference in the growing pattern of borrowers and non-borrowers group. The factors that

statistically significant impact SMEs growth as identified in the model propose several important implications. First, credit should not be considered as the miracle of growth but priority should be given to developing customer relationship and owner's proactivity. Alternatively, efforts to enhance SMEs growth should start from the enterprise's internal resources, including owner's human capital and export rather than financial capital. Second, the reliance on external financing of SMEs in manufacturing and construction proved to be counterproductive. Therefore, getting money from outside (even if it is easy) might not be a good strategy. From a policy perspective, better regulations should be implemented to ensure formal financing target the right sectors rather than lending excessively to unproductive sectors as have been common in recent years.

## References

- Akoten, J. E., Sawada, Y., & Otsuka, K. (2006). The determinants of credit access and its impacts on micro and small enterprises: The case of garment producers in Kenya. *Economic development and cultural change*, 54(4), 927-944. doi: <http://dx.doi.org/10.1086/503585>
- Allen, F., Chakrabarti, R., De, S., Qian, J. Q., & Qian, M. (2012). Financing firms in India. *Journal of Financial Intermediation*, 21(3), 409-445. doi: <http://dx.doi.org/10.1016/j.jfi.2012.01.003>
- Atieno, R. (2009). Linkages, access to finance and the performance of small-scale enterprises in Kenya. <http://hdl.handle.net/10419/45148>
- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V. (2010). Formal versus Informal Finance: Evidence from China. *Review of Financial Studies*, 23(8), 3048-3097. doi: <http://dx.doi.org/10.1093/rfs/hhq030>
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2005). Financial and Legal Constraints to Growth: Does Firm Size Matter? *The Journal of Finance*, 60(1), 137-177. doi: <http://dx.doi.org/10.2307/3694836>
- Binks, M. R., & Ennew, C. T. (1996). Growing firms and the credit constraint. *Small Business Economics*, 8(1), 17-25. doi: <http://dx.doi.org/10.1007/BF00391972>
- DALBERG. (2011). Report on Support to SMEs in Developing Countries Through Financial Intermediaries: Dalberg Global Development Advisors.
- GSO. (2013). *Interim Results of the 2012 Establishment Census*. Hanoi: Vietnam General Statistics Office.
- Hamilton, B. H., & Nickerson, J. A. (2003). Correcting for endogeneity in strategic management research. *Strategic Organization*, 1(1), 51-78. doi: <http://dx.doi.org/10.1177/1476127003001001218>.
- Heckman, J. J. (1979). Sample selection bias as a specification error. *Econometrica: Journal of the econometric society*, 153-161.
- Khandker, S., Samad, H. A., & Ali, R. (2013). Does access to finance matter in microenterprise growth? evidence from Bangladesh. *Evidence from Bangladesh (January 1, 2013)*. *World Bank Policy Research Working Paper*(6333).
- Kira, A. R., & He, Z. (2012). The Impact of Firm Characteristics in Access of Financing by Small and Medium-sized Enterprises in Tanzania. *International Journal of Business and Management*, 7(24), p108. doi: <http://dx.doi.org/10.5539/ijbm.v7n24p108>
- Lee, L.-F. (1982). Some approaches to the correction of selectivity bias. *The Review of Economic Studies*, 49(3), 355-372. doi: <http://dx.doi.org/10.2307/2297361>

- Malesky, E. J., & Taussig, M. (2009). Where Is Credit Due? Legal Institutions, Connections, and the Efficiency of Bank Lending in Vietnam. *Journal of Law, Economics, and Organization*, 25(2), 535-578. doi: <http://dx.doi.org/10.1093/jleo/ewn011>
- MPI. (2012). White paper on small and medium sized enterprises in Vietnam 2011. Hanoi: Ministry of Planning and Investment: Agency for enterprise development.
- Rahaman, M. M. (2011). Access to financing and firm growth. *Journal of Banking & Finance*, 35(3), 709-723. doi: <http://dx.doi.org/10.1016/j.jbankfin.2010.09.005>
- Shinozaki, S. (2012). A New Regime of SME Finance in Emerging Asia: Empowering Growth-Oriented SMEs to Build Resilient National Economies: Asian Development Bank.
- Wagenvoort, R. (2003). Are finance constraints hindering the growth of SMEs in Europe? *EIB papers*, 8(2), 23-50.
- Yiu, D., Su, J., & Xu, Y. (2012). Alternative financing and private firm performance. *Asia Pacific Journal of Management*, 1-24. doi: <http://dx.doi.org/10.1007/s10490-012-9303-y>

## Appendix 1: Description of the variables

Name	Description	Mean	Standard deviation
<b>1. Owner characteristics</b>			
<i>AGE1</i>	Dummy variable taking value of 1 if owner is younger than 30 and 0 otherwise	0.135524	0.342634
<i>AGE2</i>	Dummy variable taking value of 1 if owner is older than 40 and 0 otherwise	0.373717	0.484287
<i>BACHELOR</i>	Dummy variable taking value of 1 if owner has a bachelor degree or postgraduate and 0 otherwise	0.747433	0.434931
<i>OWNER_EXP</i>	Number of years owner has been doing business	10.31725	6.282321
<b>2. SMEs Characteristics</b>			
<i>FIRM_AGE</i>	Number of years of establishment	5.885010	4.800026
<i>SIZE2012</i>	Number of employees in 2012	25.11704	43.06432
<i>SECTOR2</i>	Dummy variable taking value of 1 if SME is in manufacturing or construction sector, 0 otherwise	0.158111	0.365220
<i>SECTOR3</i>	Dummy variable taking value of 1 if SME is in service sector, 0 otherwise	0.447639	0.497762
<i>EXPORT</i>	Dummy variable taking value of 1 if the firm export directly, 0 otherwise	0.098563	0.298380
<b>4. SMEs Creditworthiness</b>			
<i>COLLATERAL</i>	Dummy variable taking value of 1 if the loan is collateralized, 0 otherwise	0.316222	0.465479
<i>ACC_BOOK</i>	Dummy variable taking value of 1 if SME has an accounting book, 0 otherwise	3.958932	1.619822

**Appendix 2: Pairwise correlation of the independent variables**

	AGE1	AGE2	BACHELOR	OWNER_EXP	FIRM_AGE	SIZE2012	SECTOR2	SECTOR3	EXPORT	COMBANK_NW	CUSTOMER_NW	ACC_BOOK	COLLATERAL	ASSIST
AGE1	1													
AGE2	-0.3059*	1												
BACHELOR	0.0231	-0.0003	1											
OWNER_EXP	-0.3283*	0.5175*	-0.0226	1										
FIRM_AGE	-0.2057*	0.3451*	-0.0011	0.4625*	1									
SIZE2012	-0.1050*	0.0873	0.2034*	0.1883*	0.3818*	1								
SECTOR2	-0.0729	0.0957*	0.0965*	0.1288*	0.1501*	0.3031*	1							
SECTOR3	0.0296	-0.1320*	0.0196	-0.0498	-0.0843	-0.0751	-0.3901*	1						
EXPORT	-0.0303	0.0721	0.1764*	0.07	0.1688*	0.1455*	0.1210*	-0.076	1					
COMBANK_NW	-0.1011*	0.1766*	0.2470*	0.1808*	0.1671*	0.2251*	0.1256*	-0.0401	0.1636*	1				
CUSTOMER_NW	-0.0715	0.017	0.0378	0.0595	0.0256	-0.0096	-0.0273	0.0228	-0.047	0.2312*	1			
ACC_BOOK	-0.1902*	0.1237*	0.4127*	0.0743	0.0128	0.1718*	0.1077*	-0.06	0.1121*	0.1918*	-0.0065	1		
COLLATERAL	-0.1402*	0.1866*	0.1006*	0.2196*	0.2705*	0.2600*	0.1894*	-0.1504*	0.0862	0.3487*	-0.0646	0.1691*	1	
ASSIST	-0.0199	0.0788	0.0121	0.1955*	0.1282*	0.1355*	0.073	-0.1005*	-0.0033	0.2438*	0.052	0.0859	0.5021*	1

Note: \* indicates significance level of at least 5%

### Appendix 3: Multinomial logistic model of financing choices

	(1) Formal finance versus internal financing		(2) Informal finance versus internal financing		(3) Both sources versus internal financing		(4) Formal versus informal finance	
<b>Owner characteristics</b>								
<i>AGE1</i>	0.889	(0.78)	1.53	(0.848)	2.795	(2.204)	0.583	(0.50)
<i>AGE2</i>	2.332	(1.29)	1.61	(0.759)	3.14**	(1.664)	1.448	(0.82)
<i>BACHELOR</i>	0.551	(0.32)	0.51	(0.225)	0.609	(0.369)	1.070	(0.59)
<i>OWNER_EXP</i>	0.951	(0.03)	0.91**	(0.0356)	0.994	(0.0314)	1.043	(0.05)
<b>SMEs Characteristics</b>								
<i>FIRM_AGE</i>	1.094	(0.07)	1.14**	(0.0745)	1.108	(0.0730)	0.956	(0.07)
<i>SIZE2012</i>	1.014	(0.01)	0.98*	(0.0138)	1.014	(0.0103)	1.039***	(0.01)
<i>SECTOR2</i>	5.368**	(3.53)	2.69	(2.045)	3.09*	(1.999)	1.999	(1.74)
<i>SECTOR3</i>	1.236	(0.68)	1.47	(0.682)	1.20	(0.609)	0.842	(0.49)
<i>EXPORT</i>	0.102*	(0.13)	0.18	(0.203)	0.143*	(0.160)	0.576	(0.73)
<b>Networks</b>								
<i>COMBANK_NW</i>	1.128	(0.18)	1.12	(0.150)	1.46**	(0.221)	1.009	(0.17)
<i>CUSTOMER_NW</i>	0.926	(0.12)	0.83	(0.0969)	0.89	(0.125)	1.123	(0.14)
<i>ASSIST</i>	1.09e+8***	(6.5e+07)	1.2e+08***	(6.4e+07)	2.7e+08***	(1.674e+08)	0.887	(0.54)
<b>Creditworthiness</b>								
<i>ACC_BOOK</i>	3.952	(3.91)	0.973	(0.492)	3.95	(4.085)	4.060	(3.73)
<i>COLLATERAL</i>	1.9e+9***	(1.4e+09)	7.13e+07***	(5.1e+07)	4.99e+8***	(3.08e+08)	27.40***	(16.6)
Constant	0.0068***	(0.01)	0.18**	(0.14)	0.01***	(0.00326)	0.0370**	(0.05)
<b>Log of likelihood</b>	<b>-269.57</b>							
<b>LR Chi-square</b>	<b>553.24</b>							
<b>% correctly predicted</b>	<b>80.08</b>							
<b>Pseudo R2</b>	<b>0.506</b>							
<b>Observations</b>	<b>487</b>							

Note: \*\*\*, \*\*, \* indicate significance level at 1%, 5%, 10%.

Estimation results are presented in Relative Risk Ratio (RRR). Robust Standard Errors in parentheses.