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Why do SMEs not borrow more from banks? Evidence from the People's Republic of China and Southeast Asia

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ADB Working Paper Series

**Why Do SMEs Not Borrow More from Banks?
Evidence from the People's Republic of China and
Southeast Asia**

Ganeshan Wignaraja and
Yothin Jinjark

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Abstract

This study examines the relationship between firm characteristics and borrowing from commercial banks by small and medium-sized enterprises (SMEs) in the People's Republic of China (PRC) and five Southeast Asian economies (Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam). Analysis of microdata from enterprise surveys highlights key aspects of SME finance since the global financial crisis, including sources of credit, lender types, and collateral types. First, SMEs typically resort to internal sources rather than external finance (including borrowing from banks) and trade credit. Second, when it comes to external finance, SMEs typically use informal non-bank credit sources more than banks. Third, there is a positive and significant association between bank borrowing and certain characteristics of SMEs, notably financial audits, firm age, and export participation. Fourth, personal assets of SME owners tend to matter more as collateral for SME borrowing from banks than other collateral types. Improving credit guarantee systems, enhancing monitoring and credit scoring by banks, and widening the scope of collateral are possible ways to facilitate increased bank borrowing by SMEs.

JEL Classification: D22, E44, F14, L16, O14

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1. INTRODUCTION

This paper deals with a pressing empirical and policy issue that has affected developing Asia since the global financial crisis—why do small and medium-sized enterprises (SMEs) not borrow more from commercial banks, which dominate financial systems in the region? Accounting for both demand and supply of SME financing factors, it provides evidence from microdata in the People's Republic of China (PRC) and five Southeast Asian economies (Indonesia, Malaysia, Philippines, Thailand, and Viet Nam).

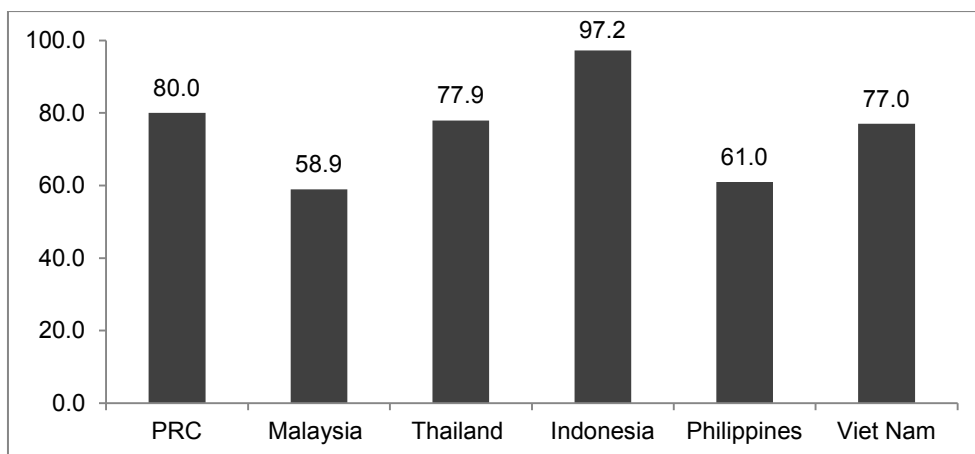
The motivation for studying SME finance and firm characteristics related to SME financial access in this paper stems from their important contribution to economic development in Asia and the unfolding implications of the global financial crisis on financial access. Figure 1 provides statistics on the contribution of SMEs to employment, gross domestic product (GDP), and exports in the PRC and the five Southeast Asian economies. As a share of employment, SMEs contribute the most in Indonesia (97.2%), followed by the PRC (80.0%), Thailand (77.9%), Viet Nam (77.0%), the Philippines (61.0%), and Malaysia (58.9%). SMEs also contribute more than 50% of GDP in the PRC and Indonesia, and around 30%–40% in Malaysia, Thailand, the Philippines, and Viet Nam. The share of SMEs' participation in exports (direct and indirect) ranges from 60% for the PRC, 29.5% for Thailand, and 19% for Malaysia, to around 15.8%–20% for Indonesia, the Philippines, and Viet Nam.

The global financial crisis of 2007–2009 caused some of the worst output slowdowns and increases in unemployment inflicted on advanced and developing economies in recent decades. While the evidence is mixed on the effects of the global crisis on SME finance, due to the severity and cross-country linkages of the great recession, there is growing policy interest in better understanding the requirements for more inclusive economic development. The performance of SMEs, which was until recently studied as a peripheral topic in the trade, development, and finance literature, has thus gained more deserved attention. This is especially the case in Asia, where trade and production networks continue to be central to economic development, supported by intermediate inputs and labor from SMEs (e.g., Harvie [2010]; Wignaraja [2013]). As the crisis and its aftermath unfolded, it became evident that access to finance was crucial to the performance of large firms and SMEs alike, particularly for those with limited access to highly liquid capital markets and commercial bank loans. Inevitably, firms with limited access to finance tend to be perceived as less creditworthy. Accordingly, our paper focuses on the issue of SME finance and the role of banks in developing Asia.

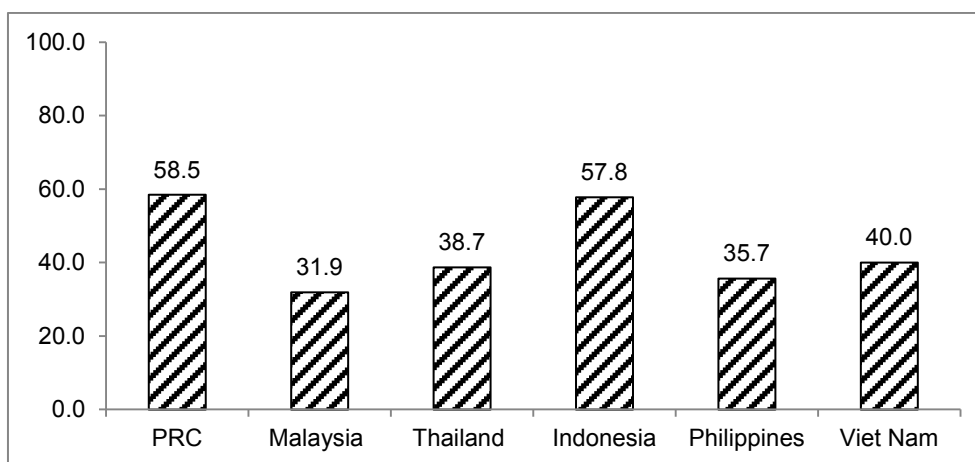
Figure 1: Contribution of SMEs in Employment, GDP, and Exports

(%)

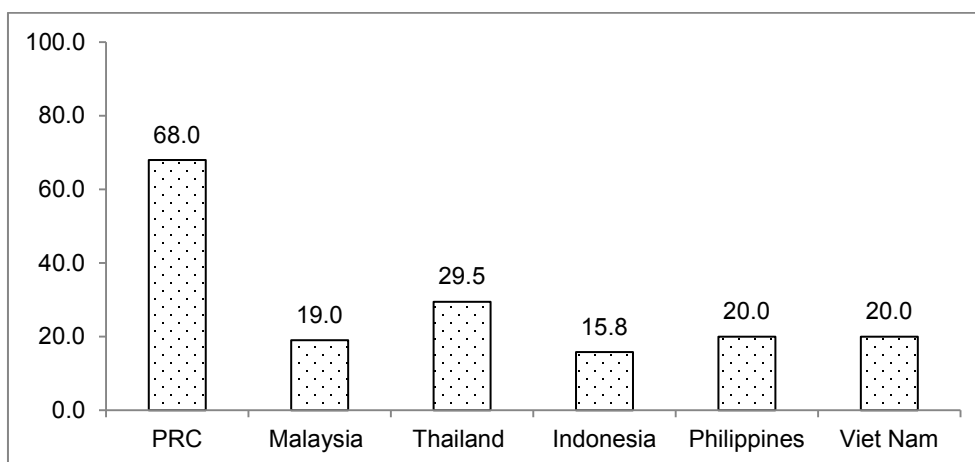
(a) Share in Employment



(b) Share in GDP



(c) Share in Exports



GDP = gross domestic product, PRC = People's Republic of China.

Source: Authors' calculations.

Evidence suggests that the financial gap of SMEs is large internationally. Based on statistics of the International Finance Corporation (IFC) (2011), 17 million firms (60% of SMEs worldwide) report that their financial needs are unmet, with more than half of these (9 million firms) in Asia. The total, global financial gap of SMEs is estimated at \$1.5 trillion–\$1.8 trillion. As Table 1 shows, the total credit gap and the average credit gap per enterprise are sizable in developing Asia. This financial difficulty is most widespread in Asia, where 70% of SMEs struggle to access finance. The IFC has estimated that for the PRC and Southeast Asia the total financial gap is approximately \$100 billion, an average of \$400,000 per SME (Stein et al. 2013).

Table 1: SME Credit Gap in Developing Asia

Economy	Total Credit Gap (\$ billion)	Average Credit Value Gap per Enterprise (\$)
Singapore	7.1	856,000
Brunei Darussalam	7.2	736,000
Hong Kong, China	10.2	733,000
Republic of Korea	28.5	503,000
Malaysia	8.0	126,000
PRC	62.7	44,000
Thailand	11.8	126,000
Indonesia	11.8	29,000
Sri Lanka	0.1	54,000
Philippines	2.0	59,000
Viet Nam	4.3	42,000
Lao PDR	0.2	13,000
India	3.4	54,000
Pakistan	2.9	51,000
Bangladesh	1.8	17,000
Cambodia	0.4	50,000

Lao PDR = Lao People's Democratic Republic, PRC = People's Republic of China, SME = small and medium-sized enterprise.

Note: "Credit gap" is the difference between formal credit provided to SMEs and total estimated potential need for formal credit based on McKinsey & Company estimates.

Source: IFC Enterprise Finance Gap Database (2011).

To assess how SMEs' demand for financial access is underserved in developing Asia, it is also imperative to account for supply-side factors that affect SME financing. For instance, Berger and Udell (2006) point out that credit availability for SMEs is largely influenced by lending technologies (financial statement lending, small business credit scoring, asset-based lending, factoring, fixed-asset lending, leasing, relationship lending, trade credit), financial institution structure (large versus small, foreign-owned versus domestic-owned, state-owned versus privately owned, competition), and lending infrastructure (information environment; legal, judicial, bankruptcy, social, tax, and regulatory environments). The relationship between SMEs and lenders as well depends on the products and services available from the lenders, e.g. domestic and foreign commercial banks. Intriguingly, some suggest that bank lending to SMEs in many economies was not affected by the financial crisis during 2007–2009 (de la Torre, Martinez Peria, and Schmukler 2010). This is perhaps because the performance of SMEs in developing countries is also driven by various firm-level characteristics,

including entrepreneurship, relational factors (social and production networks), and the business environment (Nichter and Goldmark 2009). Furthermore, others suggest SME finance and microcredit are not alternative strategies to creating employment in low-income communities in Bangladesh due to differences in firm-level characteristics such as education and professional skills (Bauchet and Morduch 2013).

The premise of our study is that a broad range of firm characteristics—of SMEs, non-SMEs, and of firms that can access finance as well as of others that are unable to—help relate the aspects of SME finance to demand- and supply-side factors. We are particularly interested in four issues in SME finance. First, what is the relative importance of external finance vis-à-vis internal finance for SME and larger firms? Second, which sources of external finance matter more for SMEs? Third, how are SMEs' characteristics associated with the extent of their bank borrowing? And fourth, what is the role of collateral in bank borrowing for SMEs?

With the availability of cross-country firm-level data, notably the World Bank Enterprise Survey, several observable firm characteristics can be studied, including firm age, export participation, foreign ownership, managerial experience, financial audit, and ISO certification, among others. There are also several aspects of SME finance that can be explored in firm-level data, including, for instance, the proportion of bank borrowing in working capital, line of credit availability, type of collateral used, and type of credit and lenders. However, the firm-level data do not enable us to disentangle the influence of national-level factors on the demand and supply for SME finance.¹

The topic of SME finance cuts across the literature on trade, development, and finance. Compared to large local firms and multinational corporations (MNCs), SMEs have more difficulty in accessing finance partly because their small size and lack of credit worthiness add to the inefficiency of credit markets due to problems of asymmetric information (Stiglitz and Weiss [1992]; Storey [1994]). SMEs tend to face even greater difficulty in developing economies, where capital markets and regulatory frameworks are not fully developed, and financial systems tend to be dominated by banks, which is found to be associated with lower use of financial services by firms of all sizes (Beck, Demirgüç-Kunt, and Singer 2013). Our analysis contributes to the small but growing body of research on SME finance in developing Asia. Using data from 2005, Shen, Xu, and Bai (2009) found that in the PRC, local proper lending authority, competition, credit schemes, and law enforcement are supportive to loan provisions by commercial banks to SMEs. Harvie, Narjoko, and Oum (2013) studied a sample of 150 questionnaires collected in 2010 from Cambodia, Indonesia, Lao PDR, the PRC, Malaysia, the Philippines, Thailand, and Viet Nam, and found that SMEs in these developing Asian economies tend to depend on internal finance for start-ups and business expansion. Jinjarak, Mutuc, and Wignaraja (2014) find that factors that affect export participation of firms in developing Asia also influence firms' credit access. Our study delves further into firm-level determinants of SME finance in the PRC, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam, using data mostly from 2011 and covering 8,080 firms. We also attempt to draw policy implications and lessons learned on SME finance from other countries.

The rest of the paper is structured as follows. Section 2 provides descriptive analysis, covering commercial bank loans of SMEs, data, and summary statistics of our sample derived from the World Bank Enterprise Survey. Section 3 discusses the econometric specification and reports regression results, followed by analysis of the economic

¹ These can include financial market development, risk appetite of commercial banks toward SME lending, and government policies (e.g., credit guarantee schemes, collateral laws, and regulations on foreclosure).

significance of firm-level determinants on SME finance based on the estimation. Policy implications and concluding remarks are provided in Section 4.

2. DESCRIPTIVE ANALYSIS

2.1 SMEs and Bank Borrowing

Table 2 provides statistics on outstanding SME loans from commercial banks, as a percentage of GDP. Drawn from the IMF Financial Access Survey, the data are a useful indicator of SME finance at the country level, though observations are only available from 2005. For sample countries in this paper, data for the Philippines and Viet Nam are missing altogether, while data for Indonesia are only available for 2011 and 2012. Missing data and incomplete information underline the challenges facing studies on SMEs at both the macro and the micro level. The table also provides national definitions of SMEs for the countries studied, in terms of the number of employees, sales, loan size, and the existence of a monitoring agency in each country.

Table 2: Outstanding SME Loans from Commercial Banks
(% of GDP)

Year	PRC	Malaysia	Thailand	Indonesia	Philippines	Viet Nam
2005	..	..	30.2	..	..	..
2006	..	..	29.2	..	..	..
2007	..	16.8	26.8	..	..	..
2008	24.6	15.9	25.7	..	..	..
2009	29.8	17.3	23.8	..	..	..
2010	31.3	15.9	22.9	..	..	..
2011	32.8	16.9	25.3	6.2	..	..
2012	36.4	18.4	26.5	6.4	..	..

National Definitions of an SME

Employees	..	150	200	..	..	..
Sales (\$ million)	..	7.0	..	4.8	..	..
Loan Size	..	..	..	..	..	..
Monitoring Agency	..	Yes	Yes	Yes	Yes	..

GDP = gross domestic product, PRC = People's Republic of China, SME = small and medium-sized enterprise.

Source: IMF Financial Access Survey.

The data suggest growing bank borrowing by SMEs in the PRC during 2008–2012, with increased SME loans from banks by 8% of GDP. On the other hand, Thailand shows a U-shaped trend in SME bank borrowing; SME loans declined from 30.2% of GDP in 2005, to 22.9% in 2010, then rose again to 26.5% in 2012. Bank borrowing of

SMEs is 16%–18% of GDP in Malaysia. For Indonesia, SME loans from banks are only about 6% of GDP.

The aggregate data suggest that the macro pattern of bank borrowing of SMEs differs remarkably across economies in developing Asia. The next step for the empirical analysis is to investigate how bank borrowing, line of credit availability, and important aspects of SME finance are correlated with firm-level characteristics in the sample countries.

2.2 Data

We rely on firm-level survey data from the World Bank Enterprise Survey (WBES). The data were collected using stratified random sampling with replacement, based on face-to-face interviews and questionnaires from business owners and senior managers of firms. As our interest is on SMEs in developing Asia, we focus on the PRC, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam, allowing for variation in economy size and stage of economic development. The data are mostly drawn from the 2011 survey year for the PRC and the five Southeast Asian economies.² The data originally contained 8,681 firms for these economies, of which 2,700 are from the PRC, 1,444 from Indonesia, 1,115 from Malaysia, 1,326 from the Philippines, 1,043 from Thailand, and 1,053 from Viet Nam. To prepare a sample for estimation, we focus on the variables listed in Table 3. After dropping firms with missing information of these key variables, our final sample has 8,080 firms, of which 5,588 are firms with 100 or fewer employees—these firms are SMEs in our baseline classification, consistent with a broad OECD definition of firm size. In our empirical analysis, we also conduct estimation for firms of various size groups, ranging from 0–25, 25–100, 100–250, and 250+ employees.

² For Malaysia and Thailand, the data are from the 2006 survey.

Table 3: Summary Statistics

Whole Sample					
Variable	Obs.	Mean	Std. Dev.	Min	Max
SME indicator	8,080	0.69	0.46	0	1
Number of employees	8,080	190.46	759.42	2	30000
Bank borrowing (% working capital)	8,080	14.91	26.33	0	100
Line of credit availability	8,080	0.44	0.50	0	1
Internal finance (% working capital)	8,080	70.95	36.01	0	100
Non-bank borrowing (% working capital)	8,080	0.95	6.68	0	100
Trade credit (%)	8,080	7.26	18.35	0	100
Collateral: property and equipment	8,080	0.18	0.38	0	1
Collateral: account receivables	8,080	0.03	0.17	0	1
Collateral: personal assets	8,080	0.06	0.23	0	1
Collateral/Loan value (%)	8,080	19.03	43.52	0	250
Lender: private commercial banks	8,080	0.12	0.33	0	1
Lender: state-owned banks	8,080	0.13	0.34	0	1
Lender: microfinance and cooperatives	8,080	0.01	0.09	0	1
Lender: others	8,080	0.74	0.44	0	1
Firm age (years)	8,080	19.06	11.38	1	126
Export participation (% of sales)	8,080	18.68	33.84	0	100
Foreign ownership	8,080	0.19	0.39	0	1
Managerial experience (years)	8,080	13.59	9.97	0	70
Financial audit	8,080	0.62	0.49	0	1
ISO certification	8,080	0.37	0.48	0	1
SMEs (employees ≤ 100)					
Variable	Obs.	Mean	Std. Dev.	Min	Max
SME indicator	5,588	1.00	0.00	1	1
Number of employees	5,588	33.75	27.07	2	100
Bank borrowing (% working capital)	5,588	13.03	25.21	0	100
Line of credit availability	5,588	0.37	0.48	0	1
Internal finance (% working capital)	5,588	73.29	35.28	0	100
Non-bank borrowing (% working capital)	5,588	0.99	7.03	0	100
Trade credit (%)	5,588	6.98	18.38	0	100
Collateral: property and equipment	5,588	0.15	0.36	0	1
Collateral: account receivables	5,588	0.02	0.14	0	1
Collateral: personal assets	5,588	0.07	0.25	0	1
Collateral/Loan value (%)	5,588	15.44	39.18	0	250
Lender: private commercial banks	5,588	0.11	0.32	0	1
Lender: state-owned banks	5,588	0.11	0.31	0	1
Lender: microfinance and cooperatives	5,588	0.01	0.10	0	1
Lender: others	5,588	0.77	0.42	0	1
Firm age (years)	5,588	18.03	10.67	2	101
Export participation	5,588	11.60	27.68	0	100
Foreign ownership	5,588	0.13	0.34	0	1
Managerial experience	5,588	13.21	9.73	0	70
Financial audit	5,588	0.55	0.50	0	1
ISO certification	5,588	0.25	0.43	0	1

SME = small and medium-sized enterprise.

Note: This table provides summary statistics of firm-level variables in estimation for the whole sample (top) and a subsample of firms with 100 or fewer employees (bottom).

Source: Authors' calculations on World Bank Enterprise Survey (WBES) data.

SMEs have an average size of 34 employees; in contrast, the average is 190 employees for the whole sample (and 541 employees in a non-SME subsample). The summary statistics suggest that average bank borrowing as a percentage of working capital for SMEs is about 2% lower than the whole sample average (and 6% lower than the non-SME subsample). Additionally, for the SME subsample, 37% has line of credit availability, lower than the 43% for the whole sample (and 58% in the non-SME subsample). SMEs also appear to depend more on internal finance, use smaller collateral as a percentage of loan size, have lower firm age, export less as a percentage of total sales, have lower foreign ownership, are operated by less experienced managers, and are more likely to have no financial audit or ISO certification.

3. ESTIMATION ANALYSIS

3.1 Econometric Specification

We specify the dependent variable, y_{it} , as a function of firm characteristics, X_{it} :

$$y_{it} = X_{it}'b + e_{it}$$

where i denotes a firm; t the year; y the dependent variable; X a set of firm characteristics; b the coefficient estimate; and e the error term. We use two measures as our main dependent variable: (1) a continuous-value variable for bank borrowing as a percentage of working capital and (2) a dummy variable for line of credit availability. Additionally, to allow for various aspects of financial access, the dependent variable (y), we also use a dummy variable for lender type (private commercial banks, state-owned banks, microfinance and cooperatives, and others), a continuous-value variable for the collateral/loan value ratio and a dummy variable for collateral type (property and equipment, account receivables, and personal assets), and a continuous-value variable for the proportion of credit type (internal finance, external finance, and trade credit).

For continuous-value dependent variables (bank borrowing as a percentage of working capital, proportion of credit type, and collateral/loan value ratio), we use a Tobit estimation:

$$\frac{\text{Bank Borrowing}}{\text{Working Capital}} = f \left(\begin{array}{l} \text{Firm Age, Export Participation, Foreign Ownership,} \\ \text{Managerial Experience, Financial Audit, ISO Certification,} \\ \text{Industry and Country Fixed Effects} \end{array} \right)$$

For dummy variable dependent variables (line of credit availability, lender type, and collateral type), we use a Probit estimation:

$$\begin{aligned} & \text{Probability (Line of Credit Availability)} \\ & = f \left(\begin{array}{l} \text{Firm Age, Export Participation, Foreign Ownership,} \\ \text{Managerial Experience, Financial Audit, ISO Certification,} \\ \text{Industry and Country Fixed Effects} \end{array} \right) \end{aligned}$$

We run the estimations separately for firms of different sizes, industries, country groups, and countries, in addition to estimation on the whole sample of 8,080 firms.

Our baseline specifications pool the firm observations from all six countries in order to maximize the sample size and variation of firm characteristics in the data. For robustness checks, we also provide the estimates from regressions that disaggregate the firm observations by firm size, industry, and country. These alternative configurations and battery of results help us to verify the supportive evidence on the influence of firm characteristics based on data and estimation, and also derive economic significance of the determinant variables for policy implications on SME finance subsequently.

3.2 Estimation Results

This section provides micro-level evidence on the four issues concerning the relationship between firm characteristics and borrowing from commercial banks being studied in this paper: (1) What is the relative importance of internal versus external finance for SMEs? (2) Which sources of external finance matter more for SMEs? (3) What is the link between SME characteristics and bank borrowing? (4) What is the role of collateral in bank borrowing by SMEs?

3.2.1 Credit Type

Table 4 provides coefficient estimates for a Probit estimation using a dummy variable for line of credit availability. A first noticeable pattern is that the effects of firm characteristics on line of credit availability are opposite to the effects of firm characteristics on proportion of credit type. SMEs use more internal finance and are less likely to have lines of bank credit and trade credit; younger firms use more internal finance and are less likely to have lines of credit; export-oriented firms use less internal finance and are more likely to have lines of credit and trade credit; foreign-owned firms tend to use more trade credit; firms with more experienced managers tend to use more internal finance; firms with financial audit tend to have lines of credit; and firms with ISO certification tend to use more internal finance. The results are consistent with data on the sources of finance for investment projects of SMEs in developing Asia, shown in Figure 2.

Table 4: Credit Type

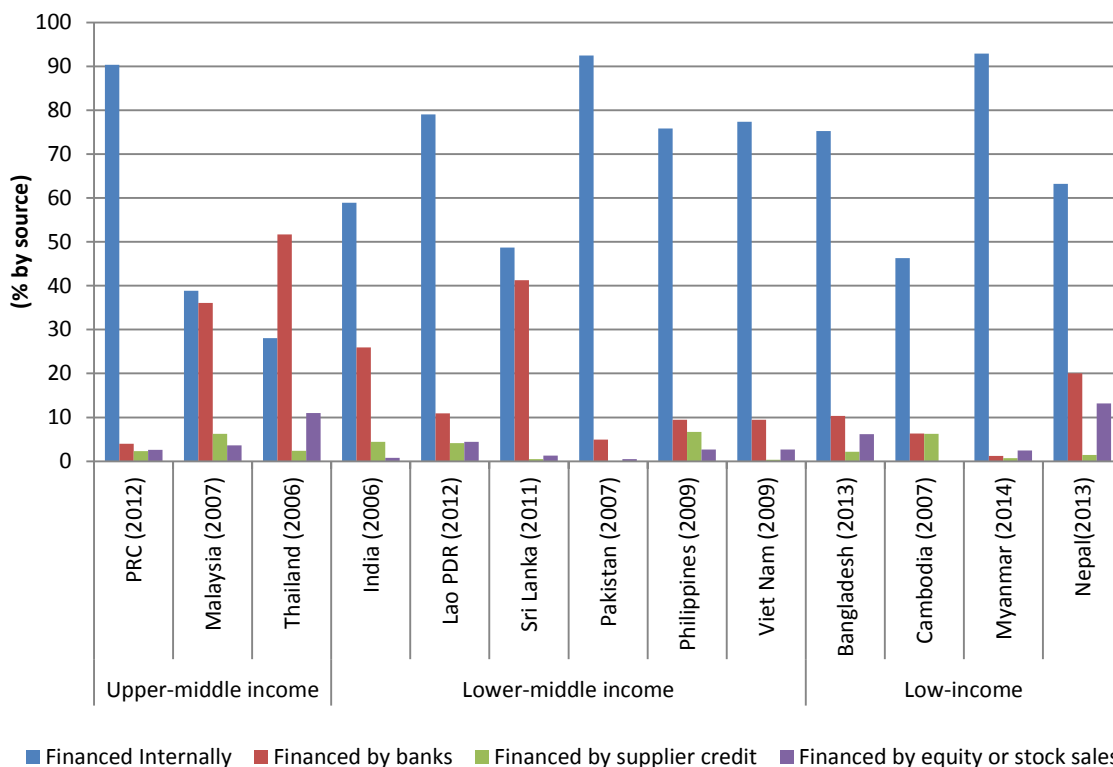
Y = Credit Used	Probit Estimation: Line of Credit Availability	Probit Estimation: Probability of Credit Type		
		Internal Finance (internal funds and retained earnings)	External Finance	Trade Credit
SME dummy variable	-.41 (.04) ^{***}	13.25 (2.22) ^{***}	-1.23 (4.35)	-.95 (2.34)
Firm age	.01 (.00) ^{***}	-.65 (.08) ^{***}	.38 (.15) ^{**}	.33 (.09) ^{***}
Export participation	.001 (.00) ^{***}	-.15 (.03) ^{***}	.08 (.06)	.08 (.03) ^{***}
Foreign ownership	-.05 (.04)	-7.70 (2.46) ^{***}	-12.61 (5.21) ^{**}	12.17 (2.51) ^{***}
Managerial experience	-.01 (.00) ^{***}	.75 (.09) ^{***}	-.12 (.18)	-.13 (.10)
Financial audit	.29 (.03) ^{***}	-17.44 (2.00) ^{***}	3.65 (3.90)	19.66 (2.19) ^{***}
ISO certification	-.07 (.03) ^{**}	20.54 (2.12) ^{***}	3.01 (4.11)	-8.06 (2.22) ^{***}
Labor-intensive industries	.30 (.04) ^{***}	-26.47 (2.76) ^{***}	1.48 (5.56)	6.02 (2.99) ^{**}
Capital-intensive industries	.33 (.04) ^{***}	-27.29 (2.50) ^{***}	7.47 (4.94)	11.59 (2.68) ^{***}
constant	-.35 (.06) ^{***}	118.39 (3.76) ^{***}	-135.47 (10.43) ^{***}	-77.32 (4.40) ^{***}
Pseudo R-sq.	.05	.01	.00	.01
observations	8,080	8,080	8,080	8,080

SME = small and medium-sized enterprise.

Note: This table reports regression results of line of credit availability and credit type (dummy dependent variable) on firm characteristics (control variables) for firms at different sizes. The estimation method is Probit. The analysis pools firm observations across the People's Republic of China, Malaysia, Thailand, Indonesia, Philippines, and Viet Nam. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

Figure 2: Sources of Finance for Investment Projects of SMEs in Developing Asia



Lao PDR = Lao People’s Democratic Republic, PRC = People’s Republic of China, SME = small and medium-sized enterprise.

Note: SMEs are defined as firms with fewer than 100 employees. The years of the source data vary by country and are included in parentheses.

Source: Authors’ calculations using World Bank Enterprise Survey data.

3.2.2 Lender Type

Table 5 provides a Probit estimation of a dummy variable for lender type on borrowing firm characteristics. The lender types considered include private commercial banks, state-owned banks, microfinance and cooperatives, and others. The results suggest that SMEs are less likely to borrow from private commercial banks and state-owned banks, but more likely to borrow from others (excluding microfinance and cooperatives). Firms with more experienced managers tend to borrow from private commercial banks, state-owned banks, and microfinance and cooperatives, whereas firms with less experienced managers tend to borrow from other sources.

Table 5: Lender Type

Y = Lender Type Borrowed from	Probit Estimation: Probability of Lender Type			
	Private commercial banks	State-owned banks	Microfinance and cooperatives	Other (money lenders, friends, relatives)
SME dummy variable	-.15 (.04) ^{***}	-.41 (.04) ^{***}	.13 (.12)	.36 (.04) ^{***}
Firm age	.00 (.00)	-.02 (.00) ^{***}	-.01 (.00)	.01 (.00) ^{***}
Export participation	.00 (.00)	-.00 (.00)	-.00 (.00)	.00 (.00)
Foreign ownership	-.02 (.05)	-.73 (.06) ^{***}	-.10 (.14)	.43 (.05) ^{***}
Managerial experience	.02 (.00) ^{***}	.02 (.00) ^{***}	.02 (.00) ^{***}	-.03 (.00) ^{***}
Financial audit	.01 (.04)	-.13 (.04) ^{***}	-.04 (.09)	.06 (.03) [*]
ISO certification	-.14 (.04) ^{***}	.30 (.04) ^{***}	-.07 (.11)	-.10 (.04) ^{***}
Labor-intensive industries	-.06 (.05)	-.12 (.05) ^{**}	.09 (.13)	.11 (.05) ^{**}
Capital-intensive industries	-.02 (.05)	-.10 (.05) ^{**}	.17 (.12)	.06 (.04)
constant	-1.32 (.07) ^{***}	-.70 (.07) ^{***}	-2.64 (.18) ^{***}	.48 (.06) ^{***}
Pseudo R-sq.	.03	.08	.03	.06
observations	8,080	8,080	8,080	8,080

SME = small and medium-sized enterprise.

Note: This table reports regression results of lender type (dummy dependent variable) on firm characteristics (control variables) for firms at different sizes. The estimation method is Probit. The analysis pools firm observations across the People's Republic of China, Malaysia, Thailand, Indonesia, the Philippines, and Viet Nam. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

Table 6 provides results by firm size. Bank borrowing as a percentage of working capital is estimated on firm characteristics by size categories: 0–25, 25–100, 100–250, and 250+. The estimation suggests that bank borrowing is positively associated with firm age and export participation, and negatively associated with foreign ownership for all firm size categories. The effect of managerial experience on bank borrowing is negative on firms with 100 or fewer employees, but positive for firms with more than 250 employees. Financial audit has a mostly positive effect on firms, and is statistically significant for firms with fewer than 25 employees and firms with more than 250 employees. The effect of ISO certification on bank borrowing is negative and statistically significant for all sizes of firms except those larger than 250 employees. Labor-intensive and capital-intensive industries tend to use bank borrowing more than services industries.

Table 6: Firm Size and Bank Borrowing
(% working capital)

Y = Bank Borrowing (% working capital)	Firm Size (number of employees)			
	≤ 25	> 25 and ≤ 100	> 100 and ≤ 250	> 250
Firm age	.52 (.21)**	.37 (.14)***	.49 (.16)***	.30 (.13)**
Export participation	.30 (.09)***	.15 (.05)***	.12 (.05)**	.10 (.05)**
Foreign ownership	-21.77 (8.51)**	-29.83 (4.23)***	-15.42 (4.60)***	-21.93 (3.94)***
Managerial experience	-.52 (.22)**	-.45 (.15)***	.10 (.19)	.28 (.16)*
Financial audit	9.37 (4.30)**	1.27 (3.16)	3.97 (4.58)	8.89 (4.46)**
ISO certification	-18.23 (6.60)***	-11.54 (3.18)***	-6.88 (3.99)*	-1.26 (4.03)
Labor-intensive industries	5.44 (5.53)	9.13 (4.67)*	20.11 (6.76)***	17.07 (6.50)***
Capital-intensive industries	16.12 (5.01)***	12.62 (4.13)***	20.14 (6.16)***	2.52 (6.05)
constant	-73.61 (6.26)***	-26.43 (5.31)***	-38.62 (8.00)***	-22.15 (8.08)***
Pseudo R-sq.	.01	.01	.01	.01
observations	2,859	2,729	1,336	1,156

Note: This table reports regression results of bank borrowing as a percentage of working capital (continuous dependent variable) on firm characteristics (control variables) for firms at different sizes. The estimation method is Tobit. The analysis pools firm observations across the People's Republic of China, Malaysia, Thailand, Indonesia, the Philippines, and Viet Nam. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

3.2.3 Collateral Type

Table 7a provides a Probit estimation of collateral type on firm characteristics. Results suggest that SMEs are less likely than larger firms to use property and equipment and account receivables as collateral, while foreign-owned firms tend to use other types of collateral. Older firms, export-oriented firms, foreign-owned firms, firms with less-experienced managers, and financially audited firms tend to have higher collateral/loan value ratios. However, if we look at the percentage of firms reporting use of collateral, by type of collateral and firm size (number of employees), reported in Table 7b, property and equipment do matter for SMEs as collateral. Our results show that all else equal, property and equipment are less important for SMEs relative to larger firms. As shown in Table 7c, there is a positive and statistically significant association between SME bank borrowing and the use of personal assets as collateral.

Table 7a: Collateral Type—All Firms

Y = Collateral in Use	Probit Estimation: Probability of Collateral Type		
	Property and Equipment	Account Receivables	Personal Assets
SME dummy variable	-0.44 (.04) ^{***}	-0.36 (.06) ^{***}	.06 (.06)
Firm age	-0.01 (.00) ^{***}	-0.01 (.00) ^{***}	-0.02 (.00) ^{***}
Export participation	-0.00 (.00) ^{**}	.00 (.00)	.00 (.00)
Foreign ownership	-0.37 (.05) ^{***}	-0.21 (.08) ^{**}	-0.59 (.09) ^{***}
Managerial experience	.03 (.00) ^{***}	.02 (.00) ^{***}	.02 (.00) ^{***}
Financial audit	-0.14 (.04) ^{***}	.20 (.07) ^{***}	-0.21 (.05) ^{***}
ISO certification	.01 (.04)	.30 (.06) ^{***}	-0.14 (.06) ^{**}
Labor-intensive industries	.06 (.05)	-0.10 (.09)	.01 (.07)
Capital-intensive industries	.07 (.04) [*]	-0.05 (.07)	-0.04 (.06)
constant	-0.73 (.07) ^{***}	-1.93 (.11) ^{***}	-1.33 (.09) ^{***}
Pseudo R-sq.	.06	.08	.06
observations	8,080	8,080	8,080

Note: This table reports regression results of collateral type (dummy dependent variable) and collateral/loan value (continuous dependent variable) on firm characteristics (control variables) for firms at different sizes. The estimation method is Probit. The analysis pools firm observations across the People's Republic of China, Malaysia, Thailand, Indonesia, the Philippines, and Viet Nam. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

Table 7b: Collateral Use across Firm Size

Firm Size (number of employees)	Properties and Equipment	Account Receivables	Personal Assets
≤ 25	11.68%	0.98%	6.40%
> 25 and ≤ 100	18.14%	3.19%	6.85%
> 100 and ≤ 250	20.73%	4.72%	3.89%
> 250	27.34%	6.57%	4.24%

Note: This table provides the percentages of firms reporting use of collateral, by type of collateral and firm size (number of employees).

Source: Authors' calculations using World Bank Enterprise Survey data.

Table 7c: Collateral Type—Bank Borrowing

Y = Collateral in Use	Probit Estimation: Probability of Collateral Type		
	Property and Equipment	Account Receivables	Personal Assets
SME dummy variable	-.44 (.10)***	-.42 (.13)***	.22 (.12)*
Firm age	-.01 (.00)	-.01 (.01)**	-.02 (.00)***
Export participation	-.00 (.00)*	.00 (.00)	.00 (.00)
Foreign ownership	-.26 (.12)**	-.09 (.16)	-.76 (.18)***
Managerial experience	.01 (.00)**	.01 (.01)	.01 (.01)*
Financial audit	-.44 (.10)***	.01 (.13)	-.24 (.10)**
ISO certification	-.17 (.10)*	.41 (.13)***	-.24 (.12)**
Labor-intensive industries	.51 (.13)***	.13 (.19)	.30 (.14)**
Capital-intensive industries	.24 (.11)**	.25 (.17)	.12 (.13)
constant	.80 (.16)***	-1.37 (.23)***	-.70 (.18)***
Pseudo R-sq.	.06	.07	.08
observations	981	981	981

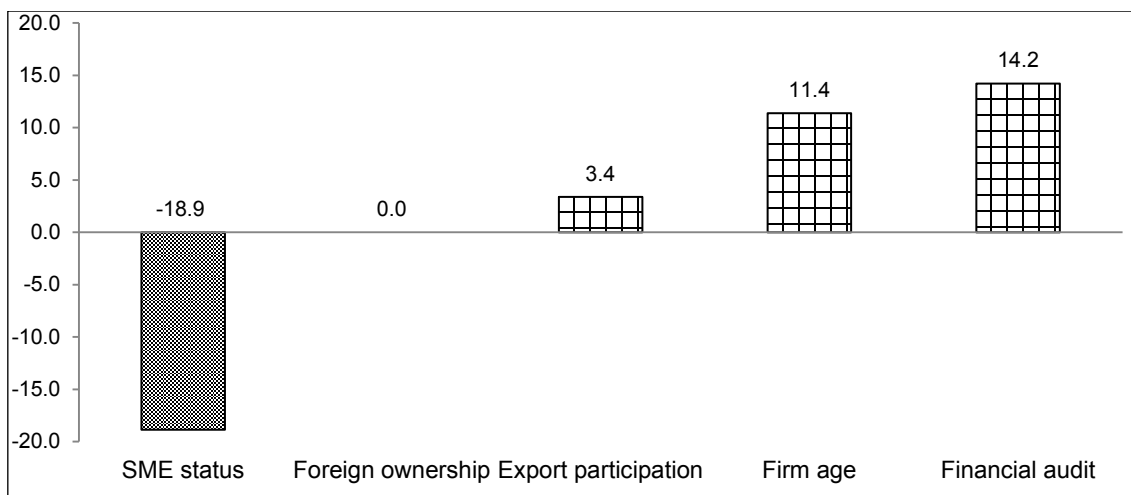
This table reports regression results of collateral type (dummy dependent variable) and collateral/loan value (continuous dependent variable) on firm characteristics (control variables) for firms at different sizes. The estimation method is Probit. The analysis pools firm observations across the People's Republic of China, Malaysia, Thailand, Indonesia, the Philippines, and Viet Nam. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

3.3 Economic Significance

We summarize our findings in Figures 3a and 3b, highlighting the economic significance of the main results. To calculate the economic significance of the explanatory variables on line of credit availability (and bank borrowing), we multiply the coefficient estimate of the variable by a standard deviation of the variable; dubbed the economic significance of a one-standard deviation increase of variable. For instance, the coefficient estimate of the SME dummy variable in the estimation of Table 4 in the first column is -0.41 , and the standard deviation of the SME dummy variable from Table 3 is 0.46 . Hence, the economic significance of a one-standard deviation increase of the SME dummy variable lowers bank borrowing as a percentage of working capital by -18.9% . We drop from the calculation the variables that are estimated with uncertainty and statistically insignificant.

Figure 3a: Economic Significance of a One-Standard-Deviation Increase of Firm Characteristics on Line of Credit Availability
(% probability)

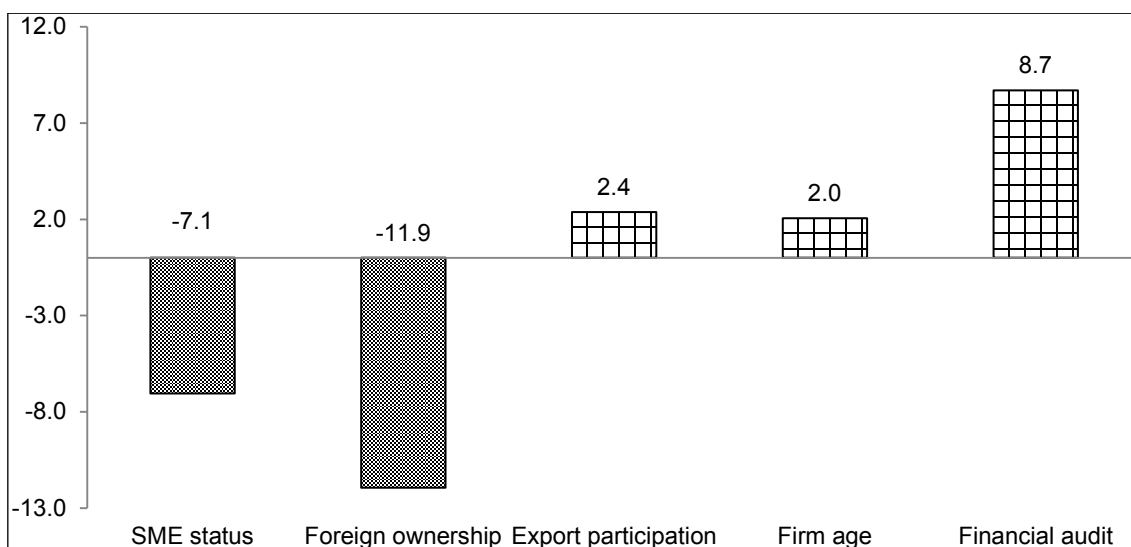


SME = small and medium-sized enterprise.

Source: Authors' calculations.

Figure 3a provides the economic significance of the explanatory variables on line of credit availability. For variables with negative association with line of credit availability, SME status has the largest economic significance (-18.9%). For variables with positive association with line of credit availability, financial audit has the largest economic significance (14.2%), followed by firm age (11.4%) and export participation (3.4%).

Figure 3b: Economic Significance of a One-Standard-Deviation Increase of Firm Characteristics on Proportion of Bank Borrowing
(% of working capital)



SME = small and medium-sized enterprise.

Source: Authors' calculations.

Figure 3b provides the economic significance of the explanatory variables on bank borrowing. As explained above, a coefficient estimate from the first column of Table A.3 is multiplied by the variable's standard deviation. For variables with negative

association with bank borrowing, foreign ownership has the largest economic significance (−11.9%), followed by SME status (−7.1%). For variables with positive association with bank borrowing, financial audit has the largest economic significance (8.7%), followed by export participation (2.4%) and firm age (2.0%).

The economic significance supports our findings that SME status has a large, negative relationship with bank borrowing and line of credit availability. Having financial audits also helps firms in accessing finance, as the audit improves financial education and transparency, which increase the credibility of firms in view of potential creditors. In addition, export participation and firm age are consistently driving both bank borrowing and line of credit availability. As firms grow older, they become (or are perceived as) stable, making bank borrowing and line of credit more accessible. The ability to enter foreign markets also serves as a signal of competitiveness and high productivity, enabling access to bank borrowing and line of credit availability. Export participation is also associated with the need to grow larger in scale, and hence a greater demand for external finance from bank borrowing and line of credit availability.

On the other hand, we find that foreign ownership has no discernible association with line of credit availability and is negatively associated with bank borrowing. This finding is plausible as firms with foreign ownership may have less necessity for bank borrowing in domestic markets since a firm's working capital can be supported by trade credit in supply chains and borrowing in international capital markets through a parent company.

4. POLICY IMPLICATIONS AND CONCLUSIONS

Using World Bank Enterprise Survey data, this study examines the relationship between firm characteristics and SME finance in a sample of firms from the PRC, Indonesia, Malaysia, the Philippines, Thailand, and Viet Nam. Several aspects of financial access, including bank borrowing, line of credit availability, and collateral, credit, and lender type, are found to be correlated with firm characteristics. The main results suggest that SME status (having fewer than or equal to 100 employees) has a significant large and negative economic influence on bank borrowing and line of credit availability, while export participation, firm age, and financial audit have opposite and significantly positive effects on SME finance.

While the focus is on firms in the PRC and Southeast Asia, our main findings suggest both similarities and differences to previous studies on other economies and sample periods. In Germany, the evidence suggests that SMEs, known as "Mittelstand," become less reliant on bank borrowing and more on equity finance and future cash flows, while capital market instruments (i.e., Mittelstand bonds) remain available to only large firms (Böttcher 2013). SMEs in our sample countries remain dependent on internal funds, implying that financial access of SMEs in developing Asia is more challenging. This is largely due to a lower level of capital market development, underdeveloped SME financing institutions, and perhaps a greater problem of asymmetric information between SME lenders and borrowers. In the United Kingdom, SMEs have also have difficulty in borrowing from banks, especially after the global financial crisis of 2008–2009, thereby influencing the Government of the United Kingdom to intervene with long-term guarantee and credit schemes for new loans, as well as to support commercially managed venture capital funds for providing equity finance (BIS 2012). The framework and implementation of government policies regarding collaterals and credit guarantees can be important to SME finance in developing Asia. In advanced economies, evidence from Japan has shown that banks

tend to monitor small business borrowers more closely when lending is collateralized (Ono and Uesugi 2009), and cross-country evidence suggests that governments can indeed support funding of small firms and new enterprises productively through credit guarantee schemes (Beck, Klapper, and Mendoza 2010). As for the role of venture capital funding for SME finance in developing Asia, it is relatively non-existent at present, and more exploration is required on its implementation and effectiveness. Japan has developed hometown investment trust funds and better credit risk databases for SMEs (Yoshino and Kaji 2013), which could potentially be applicable to SME finance in developing Asian economies.

There are several useful directions for further research on SME finance in developing Asia. First, the current research on the PRC and Southeast Asia can be strengthened by using a panel dataset and a larger sample of firms when this becomes available in the future. Furthermore, it would be invaluable to expand the sample of countries to cover South Asian economies. Second, the current dataset was largely a self-assessment by firms and thus did not cover the credit worthiness of SMEs from the viewpoint of lenders. The collection of credit scoring information at the firm level and development of a credit risk database would be informative. Third, the dataset did not permit exploration of the role of inter-country regulatory and institutional factors on SME finance. The preparation of case studies may be a tool for such analysis.

APPENDIX: ROBUSTNESS CHECK

Country Group

Table A.1 provides estimation results by country group. We separate the PRC from other countries based on its economic size, and Malaysia and Thailand based on their relatively more developed economies and financial markets than Indonesia, the Philippines, and Viet Nam. The coefficient estimates suggest that SMEs use less bank borrowing and are less likely to have line of credit availability across country groups. Export-oriented firms use more bank borrowing and are more likely to have line of credit availability in the PRC. Foreign-owned firms tend to use less bank borrowing and are less likely to have line of credit availability in the Malaysia and Thailand group, as well as in the Indonesia, Philippines, and Viet Nam group. Firms with more experienced managers and firms with ISO certification tend to have more bank borrowing and are more likely to have line of credit availability in the PRC and in the Indonesia, Philippines, and Viet Nam group. Firms with financial audit tend to have more bank borrowing and are more likely to have line of credit availability, except in the Indonesia, Philippines, and Viet Nam group.

Table A.1: Country Group

Y = Bank Borrowing (% working capital)	PRC		Malaysia, Thailand		Indonesia, Philippines, Viet Nam	
	Bank Borrowing	Line of Credit Availability	Bank Borrowing	Line of Credit Availability	Bank Borrowing	Line of Credit Availability
SME dummy variable	-13.98 (2.39)***	-.40 (.06)***	-10.10 (4.59)**	-.27 (.07)***	-31.69 (3.55)***	-.62 (.06)***
Firm age	-.15 (.14)	.00 (.00)	.33 (.19)*	-.00 (.00)	-.51 (.12)***	-.01 (.00)***
Export participation	.14 (.04)***	.00 (.00)***	.14 (.05)***	-.00 (.00)	.07 (.04)*	-.00 (.00)
Foreign ownership	-1.18 (4.41)	.12 (.11)	-49.29 (4.30)***	-.43 (.06)***	-33.11 (4.45)***	-.41 (.07)***
Managerial experience	.45 (.15)***	.01 (.00)***	.08 (.21)	-.01 (.00)**	.73 (.14)***	.01 (.00)***
Financial audit	15.56 (2.65)***	.26 (.06)***	10.15 (4.69)**	.66 (.07)***	.56 (2.94)	.10 (.05)*
ISO certification	7.50 (2.48)***	.14 (.06)**	-.76 (4.53)	.03 (.07)	14.49 (3.73)***	.38 (.06)***
Labor-intensive industries	-3.65 (3.34)	-.11 (.08)	-4.85 (4.11)	-.06 (.06)	.73 (3.75)	.06 (.06)
Capital-intensive industries	-1.62 (2.53)	.08 (.06)	.00 (.)	.00 (.)	4.85 (3.43)	.10 (.06)*
constant	-40.13 (4.82)***	-.83 (.11)***	-2.91 (8.59)	.38 (.13)***	-3.32 (5.18)	.10 (.09)
Pseudo R-sq.	.02	.05	.02	.06	.01	.05
observations	2,523	2,523	2,037	2,037	3,520	3,520

PRC = People's Republic of China, SME = small and medium-sized enterprise.

Note: This table reports regression results of bank borrowing as a percentage of working capital (continuous dependent variable) and line of credit availability (dummy dependent variable) on firm characteristics (control variables) for firms at different sizes. The estimation method is Tobit for bank borrowing and Probit for line of credit availability. The analysis is done on firm observations separately for the People's Republic of China; the Malaysia and Thailand group; and the Indonesia, Philippines, and Viet Nam group. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

A.2 Country-Specific Results and Estimation using Pooled Countries Sample

Tables A.2 and A.3 provide country-specific results, along with results using a pooled countries sample, without and with industry/country fixed effects, respectively. The estimates without fixed effects suggest that SME status, export participation, foreign ownership, and financial audit have consistent effects on bank borrowing as a percentage of working capital.

To verify the robustness of the main findings, we pool all the observations across six countries and control for industry and country fixed effects. We find that SME status and foreign ownership are negatively associated with bank borrowing, while firm age, export participation, managerial experience, financial audit, and ISO certification are positively associated with bank borrowing.

Table A.2: Country-Specific Results and Pooled Estimates

Y = Bank Borrowing (% working capital)	All	Pooling Countries			PRC	Indonesia	Malaysia	Philippines	Thailand	Viet Nam
		Labor Intensive	Capital Intensive	Services						
SME dummy variable	-20.34 (2.16)***	-25.39 (4.49)***	-17.22 (2.87)***	-16.68 (4.72)***	-13.73 (2.37)***	-18.74 (7.88)**	.41 (6.36)	-17.21 (7.68)**	-25.27 (6.71)***	-16.72 (4.44)***
Firm age	.51 (.08)***	.45 (.15)***	.43 (.11)***	.20 (.20)	-.14 (.14)	.26 (.25)	.09 (.25)	.12 (.22)	-.09 (.31)	.17 (.16)
Export participation	.22 (.03)***	.24 (.05)***	.16 (.04)***	.10 (.10)	.13 (.04)***	.20 (.11)*	.01 (.07)	-.05 (.09)	.16 (.08)**	.01 (.05)
Foreign ownership	-21.92 (2.52)***	-28.36 (4.98)***	-24.04 (3.18)***	-.72 (8.11)	-1.33 (4.41)	-19.36 (10.36)*	-19.94 (6.30)***	-11.50 (8.16)	-62.96 (6.03)***	-35.31 (5.57)***
Managerial experience	-.21 (.09)**	-.25 (.17)	-.33 (.12)***	.53 (.21)**	.44 (.15)***	.44 (.29)	.13 (.27)	.70 (.26)***	-.99 (.42)**	-.13 (.19)
Financial audit	7.79 (1.95)***	8.15 (3.95)**	10.62 (2.71)***	.01 (3.86)	15.67 (2.65)***	20.36 (7.73)***	21.93 (5.32)***	-6.80 (10.08)	.00 (.)	10.86 (3.98)***
ISO certification	-5.00 (2.02)**	2.88 (4.41)	-11.03 (2.74)***	.48 (4.14)	7.13 (2.41)***	14.36 (8.85)	-3.53 (6.08)	-6.86 (7.19)	-1.82 (6.38)	18.07 (4.43)***
constant	-22.82 (3.28)***	-20.48 (6.53)***	-14.62 (4.55)***	-34.58 (6.88)***	-41.37 (4.67)***	-53.12 (10.27)***	-10.03 (10.70)	-40.31 (14.21)***	27.50 (10.41)***	24.76 (6.08)***
Pseudo R-sq.	.01	.01	.01	.01	.02	.02	.01	.01	.03	.01
observations	8,080	2,226	4,059	1,795	2,523	1,324	1,078	1,173	959	1,023

PRC = People's Republic of China, SME = small and medium-sized enterprise.

Note: This table reports regression results of bank borrowing as a percentage of working capital (continuous dependent variable) on firm characteristics (control variables) for firms at different sizes. The estimation method is Tobit. The analysis is done on firm observations separately for pooled observations, industry-specific, as well as the People's Republic of China, Malaysia, Thailand, Indonesia, the Philippines, and Viet Nam. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

Table A.3: Country-Specific Results and Pooled Estimates with Fixed Effects

Y = Bank Borrowing (% working capital)	Pooling Countries				PRC	Indonesia	Malaysia	Philippines	Thailand	Viet Nam
	All	Labor Intensive	Capital Intensive	Services						
SME dummy variable	-15.33 (2.04)***	-21.00 (4.26)***	-11.96 (2.70)***	-14.02 (4.37)***	13.98 (2.39)***	-18.27 (7.95)**	-.02 (6.35)	-18.68 (7.64)**	-24.73 (6.75)***	16.38 (4.45)***
Firm age	.18 (.08)**	.16 (.15)	.21 (.10)**	.42 (.18)**	-.15 (.14)	.25 (.25)	.14 (.25)	.03 (.22)	-.11 (.31)	.15 (.16)
Export participation	.07 (.03)***	.09 (.05)*	.05 (.04)	.09 (.09)	.14 (.04)***	.20 (.11)*	-.00 (.07)	-.09 (.09)	.15 (.08)*	.00 (.05)
Foreign ownership	-30.63 (2.47)***	-34.05 (4.77)***	-29.49 (3.09)***	-2.08 (7.42)	-1.18 (4.41)	-19.50 (10.36)*	-21.13 (6.32)***	-13.19 (8.10)	-62.65 (6.04)***	35.66 (5.58)***
Managerial experience	.18 (.09)*	.27 (.19)	-.01 (.13)	.42 (.20)**	.45 (.15)***	.43 (.29)	.08 (.27)	.71 (.26)***	-1.00 (.42)**	-.14 (.19)
Financial audit	17.73 (2.16)***	12.96 (4.43)***	20.12 (2.96)***	18.35 (4.18)***	15.56 (2.65)***	20.72 (7.78)***	21.86 (5.31)***	-8.22 (10.04)	.00 (.00)	11.18 (3.99)***
ISO certification	4.93 (2.06)**	13.99 (4.31)***	-3.51 (2.65)	9.73 (3.93)**	7.50 (2.48)***	14.40 (8.86)	-5.60 (6.16)	-12.22 (7.33)*	-.80 (6.56)	17.46 (4.48)***
Labor-intensive industries	3.40 (2.61)				-3.65 (3.34)	2.51 (7.40)	-11.12 (5.73)*	3.28 (8.51)	3.98 (5.98)	3.87 (4.69)
Capital-intensive industries	5.89 (2.37)**				-1.62 (2.53)	2.98 (7.17)	.00 (.00)	22.80 (7.14)***	.00 (.00)	5.07 (4.23)
Indonesia	15.11 (3.26)***	15.96 (6.00)***	6.89 (4.36)	14.97 (5.90)**						
Malaysia	57.26 (3.22)***	58.38 (5.99)***	52.16 (3.57)***	.00 (.00)						
Philippines	9.51 (3.12)***	47.90 (6.35)***	25.82 (4.11)***	.00 (.00)						
Thailand	38.19 (3.56)***	47.90 (6.35)***	25.82 (4.11)***	.00 (.00)						
Viet Nam	68.21 (2.95)***	67.31 (5.76)***	63.66 (3.98)***	65.53 (5.05)***						
constant	-58.38 (3.95)***	-55.52 (7.67)***	-43.86 (5.18)***	-62.43 (7.35)***	-40.13 (4.82)***	-55.43 (11.76)***	-5.11 (10.94)	-45.46 (14.83)***	25.95 (10.67)**	21.84 (6.58)***
Pseudo R-sq.	.03	.04	.03	.04	.02	.02	.01	.01	.03	.02
observations	8,080	2,226	4,059	1,795	2,523	1,324	1,078	1,173	959	1,023

PRC = People's Republic of China, SME = small and medium-sized enterprise.

Note: This table reports regression results of bank borrowing as a percentage of working capital (continuous dependent variable) on firm characteristics (control variables) for firms at different sizes, including industry- and country-specific fixed effects. The estimation method is Tobit. The analysis is done on firm observations separately for pooled observations, industry-specific, as well as the People's Republic of China, Malaysia, Thailand, Indonesia, the Philippines and Viet Nam. Standard errors are in parentheses; *** (**, *) denotes statistical significance at the 1% (5%, 10%) level.

Source: Authors' calculations using World Bank Enterprise Survey data.

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