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What Determines the Access to Credit by SMEs?

A Case Study in Vietnam

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Abstract

Using World Bank Enterprise Survey in 2009, we investigated which factors determined SME access to credit in Vietnam. This database includes not only small and medium enterprises but also large enterprises. The scope of data is very wide but in measure of determinants of SME credit availability, the data is rather limited. Due to the characteristics of data, our paper could not aim at in-depth specific problems, but at looking for general picture of SMEs financing including endogenous and exogenous variables.

The binominal logit model is used to assess the influence of firm and financial characteristics, credit worthiness, industry and region dummy on the probability that firms access credit. We added discriminant and cluster analysis to contribute to the findings that logistic model could not reach.

Basing on logistic model, we found that besides conclusions that were consistent with other studies, there were also interesting unprecedented conclusions. Our study showed that in general, businesses in Vietnam depended too much on real estate, land as collateral compared with other Asian countries. As a result, this might cause problems for small businesses in accessing bank loans. However, this did not apply with Central North where it was extremely easy for small business to access capital. From the findings, our study suggests that more research be focused on this area in order to have deeper understanding of the factors that facilitate bank loans for SMEs which can be applied for SMEs in other areas.

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Keywords: SME credit access, Firm characteristics, Financial characteristics, Credit-worthiness and region

1. Background

Vietnam's economic reforms followed the gradual and partial steps which have showed a different pattern of transition as compared to formerly communist countries in Russia and Eastern Europe – "neoclassical" big bang or radical approach (Guo, 2004). Vietnam's economy planned orientation to market since 1986. Compared with China's economic growth rate, Vietnam was at the second position in East Asia.

Most enterprises in the world as well as Vietnamese ones face many obstacles for growth, especially in finance. The 2005 World Development Report (World Bank, 2004) showed that small firms had only 30 percent of their capitals from external sources, while large firms obtain 48 percent of their capital from external finance sources. There existed many barriers for SMEs' access to bank loans, such as lack of mortgages, banks' unwillingness to lend to SMEs, problematic tax payment reports, unsound business plans, and high lending rates. However, the situation is seen changing for the better in the coming time. Vietnam represents an interesting case because it actually ranks 21th out of 183 countries in terms of getting credit in 2011 (World Bank, 2011). This is an impressive outcome of the banking system. Commercial banks, seeking to boost lending, have begun to see SMEs as a potential market, and mapped out plans to tap those corporate customers. Regarding SMEs, despite the boom in number, SMEs' operation is not very effective, said Mr.Cao Sy Kiem, the Former Governor of the State Bank of Vietnam and President of the Vietnam SMEs Association. In addition, he asserted that SMEs mushroomed in a short period of time, especially when the Enterprise law came into effect, but they often suffered from a shortage of capital.

Even though private enterprises contributed more than 40% of GDP, they only got 13% of the lending capital due to prolix lending procedures, corruption distorting policy, lack of capital, actual interest rate higher than real interest rate. Even the government applied for economic incentive bulk in 2009, it was not easy for SME community to access the capital. According to the recent survey of central institutions of economic management (CIEM), only 30% of SMEs are able to access capital. Moreover, SMEs mainly contact commercial banks that were originated from state-owner banks holding 60% of equity.

In summary, the problem that SMEs in Vietnam face appears to be that inefficient external capital mobility has adversely affected their investment and business expansion. Therefore, the problem to be addressed in this research is to investigate the factors that determine SME access credit. My research makes two contributions. First, we provide empirical evidence to the determinants of SME access to finance. We hence complement existing literature covering general SME access to finance. Second, our findings intend to make exploitation in the financial pattern of each region and internal business characteristics in effect of SME financing that may create a clue for comparison the effectiveness in implication and deploy policy or decree.

The paper is organized as follows: the next section includes theoretical overview, derived research questions and literature reviews. Section 3, the data, research methodology and

variables is detailed. In the following section describes which factor influence SME credit availability by discriminant and cluster analysis and logit model. Section 5 presents the conclusion for SME credit availability.

2. Empirical studies and research questions

2.1 Empirical studies

The Vietnamese banking system has undergone significant reform since the beginning of the 1990s, but many challenges remain to be addressed. Despite fundamental structural changes, resource mobilization and allocation by the banking sector are still limited. At the same time, the banking sector is structurally fragile. Its composition is dominated by state-owned commercial banks (SOCBs) and its credit by State-owned enterprises (SOEs). On the other hand, the lack of competition, non price-based operation, as well as lax banking policies and regulations have impaired the development of the banking sector. The non performing loan (NPLs) has remained large throughout the reform process, so SOCB has earned quite low profit comparing with the market power they have. Nguyen et al (2008) said that in the context of Asian socialist market economy model, public sector has been playing an important role in strengthening the development of the dynamic private sector and efficient market. As in other countries, state and market have been assisting each other to create sustainable market conditions for the private sector, especially SMEs.

Rand et al's (2008) data in 2002 and 2005 showed that only 39% of the enterprises had applied for a bank loan in 2005; however, 19% of these firms experienced the problem that their total applicants were denied credit. Therefore, the ratio of denied credit is only 7.3% of the sample. The 2005 survey showed that 30% of the firms did not apply for formal loan for these reasons: (1) there was a lack of adequate collateral; (2) Found loan processes were too difficult; or (3) the interest rates were too high. This analysis applies merely descriptive analysis, yet econometric analysis.

Leasing, factoring and credit guarantee funds are not aware of normal and effective channel to raise SMEs' fund which is caused by inadequate institutional support mechanism (Freeman et al, 2007). In May 2005, State Bank of Vietnam issued Decree 65, further clarifying some definitions pertaining to leasing activity. It also ruled that lessors have the right to take possession of assets, without a court decision, if a lessee defaults on the lease contract. Yet, Vietnam does not have a full leasing law.

Malesky et al (2008) conclude that Vietnamese enterprises have connected with formal institution which has been inefficient and wasteful. Interestingly, Vietnam's most successful firms are less likely to choose formal financial system, yet likely to make their choice of retained earning and informal sources of capital for new investment. Hence, informal institutions are forced to choose lesser-quality enterprises. Due to asymmetric information between bank a borrower as well as insecure legal environment, banks focus on collateral rather than business prospects. In addition, Nguyen and Ramachandran (2006) believe that there is not significant link between profitability and leverage in Vietnamese SMEs.

In general, policy or decree or regulation is promulgated and applied to the whole country,

but various market structures and financial institutions lead to the ambiguous results in SMEs credit availability. Regarding to theory, size and asset structure are positively correlated with debt ratio. However, the empirical study of Sogrorb-Mira (2005) using a 1994-1998 Spanish Data Panel shows the result differential from theory which obtains a positive correlation with long term debt ratio but negative with short term debt ratio. In condition of asymmetric information, short term loans are considered less risky. In line with Pecking Order Theory, Spanish SME bases on internal resources instead of external ones. Pecking-order theory together with static-trade off theories is not referred to the age and leverage. Berger and Udell (1995) believe that older firm accesses credit easier than younger firms because they have been released from asymmetric information problems with the lender by improvements in the firm's public reputation.

Hyytinen and Pajarinen (2008) examine a panel of Finish SMEs to identify the determinants of small business opacity. Their main findings of the paper is the inverse relation between firm age and credit informational company as unobserved firm effects are controlled. In common, firm level is proxy for information imperfections and asymmetries. However, they could not imply firm size as a proxy for opacity and reliable predictor of firms' financing obstacles. Niskanen (2010) concludes that an increase in managerial ownership decreases debt ratio and increases collateral requirements. In addition, profitability and firm age decrease collateral requirements.

Voordeckers et al (2006) concludes that the characteristics of firm and relationship are more likely to be more important determinants of collateral/commitment protection than loan and lender characteristics. Small firms mainly borrow fund in the informal financial market, while larger firms obtain fund in the formal market. In some cases, larger firms access credit in the formal market and then transfer the loan to smaller firm with high interest rate (Tang, 1995).

2.2 Research questions

The research questions are derived from theory and the sphere of data. My optimum objective of the paper is to investigate which determinant variables influence Vietnamese small and medium enterprises' access to bank finance which is a typical case of a developing country. Most of the study paid attention to one aspect of determinants as endogenous or exogenous variables so they did not give the overall picture of determinants in terms of access to capital. So we investigated the firm characteristics such as size, age of business, machinery, land; financial characteristics including proportion of working capital financed from financial institutions, credit-worthiness variable, industry and region dummies. There are few other studies which pooled instantaneously endogenous and exogenous variables; however, those variables are not wholly similar and each paper applies different methodology.

As known, SMEs are a vulnerable object, and financial environment's characters simultaneously favour large and state-owned enterprises, therefore SMEs need the government to intervene in this sphere. However, the policy deploy creates bias outcomes across regions due to the difference in unbalanced growth, financial institutions and informational channel. Beck et al (2008) contend that countries having the same overall external financial proportion may have different financing patterns. To understand these

differences, we need to control the provincial factors. We use the variable Provincial Competitive Index (PCI) developed in 2005 by Vietnamese Chamber of Commerce and Industry (VCCI) and the U.S. Agency for International Development-supported Vietnam Competitiveness Initiative (USAID/VNCI) as a critical tool for measuring and assessing the standards of economic governance in Vietnam's 63 provinces. PCI has come to be seen as a critical tool for measuring and assessing the standards of economic governance in Vietnam's 63 provinces from the perspective of private sector businesses covering business-critical issues of entry costs, compliance costs, land access, informal charges and governance qualities on pro-activity, transparency, labor development and legal institutions. So, we anticipate that different regions have varying SMEs financing patterns which create significant differences in financing. This is the inverse finding of Beck et al (2008). So we attempted to answer the following questions:

1. How does provincial control variable influence SMEs' credit availability?

2. What is the difference of financing pattern between the regions?

Myers (1984) suggests that "the average debt ratio will vary from industry to industry because asset risk, asset type and requirements for external fund also vary by industry" (p.578). Otherwise other economists confirm that firm specific effects influence on capital structure more strongly than industry specific effects (Mac, 2010). Due to differential characteristics of each industry, the demand of access external capital is also various. In line with static trade-off theory, firm in each industry will choose the optimal capital structure where there is equality between benefit attained from capital and financial distress cost. Along with pecking order theory and at the same industry, unprofitable firms will choose higher debt ratio than profitable firm, and if the debt ratio is sufficiently high to cause financial distress, firms will reduce the debt ratio by issuing equity. According to our sphere of data and scope of analysis, we were mainly concerned about the probability of SME access capital, so we hoped to get discriminative results of each industry by applying industry dummies. Due to the transparency of information, capital structure decision in small firms which is partially different from that of large firms is widely accepted by researchers (Wu et al, 2008). Combining two ideas, we emphasized on the following question related to capital structure.

3. Is there any difference in probability of access capital in each industry and each size of business?

It seems that financial life-cycle pattern is homogenous for different industry and consistent over time (La Rocca et al, 2011). Firm age in years is frequently used to control for the fact that older firm may have more experiences of applying for loans and have deeply long relationship with banks and therefore more probability to get bank loans. Demand of capital fluctuates together with growth in each stage of business. As business is in the start-up life cycle stage, the main challenge of this period is how to mobilize money because businesses need overestimated money for formation of fixed asset and working capital. If businesses are in growth life cycle stage, one of the ranges of issues is more time and more money. However, firms in this stage are in flexibility to mobilize capital through banks, profits, partnerships

and grants and leasing options. Sales growth is manageable in established stage and maybe explosive in expansion stage, so money is not a necessity condition to develop. In contrast with the start-up life cycle stage, firms rebalance their capital structure and gradually replace debt for internal capital (La Rocca et al, 2011). The biggest issue in the mature stage is how long the business can support a negative cash flow and moving to the final stage or moving back to the expansion stage. So, financing of small and young firms predominantly concentrates in start-up and growth stages. Age and size of firms are the most commonly used proxy for opacity in the empirical literature, but it is vague to determine which variable is more significant (Hyytinen and Pajarinen, 2008; Malesky, 2008; La Rocca: 2011).

4. What is the gap in probability of acquiring bank loan in each stage of business?

The nation's financial structure and lending infrastructure and technologies influence SMEs' credit availability (Wu et al, 2008). Lending technologies can be divided into two types: transaction and relationship lending or hard and soft lending. For the undeveloped financial market, land as collateral is the instrument to overcome the asymmetric information. As in case of Vietnam, up to 90% of bank loan in PCI survey has used their Land Use Rights Certificate (LURC) as collateral (Malesky et al, 2008). Since the Land Law 1993 recognised various private interest in land, which can be transferred, leased and encumbered, without disturbing the underlying principle of state ownership of land. The ability to use a land use right certificate as collateral is particularly important which was extended and clarified by the 1998 amendment to the Land Law 1993. However, in the case of Indonesia, there is only 40% of formal bank loan using land as collateral because land is too important for borrowers without established credit histories and not significant with borrower having a past loan or some degree already solved their adverse selection problem (Dower et al, 2010). Dower (2010) posits that preceding of formal land titles leads to an ex post extending credit market to new borrowers which may not wholly right as policy makers' thinking. If land use right were not completely used as collateral, credit access is approached in alternative ways. We then checked by empirical data by answering the following question.

5. Which types of collateral are in favour of SME credit availability?

Credit-worthiness variables can be mentioned in many studies but each study refers to different variables. Due to the limitation of data, we focused on annual financial statement checked and international quality certificate as a group of credit-worthiness variables. Other researches attribute annual financial statement checked and international quality certificate as a group of firm characteristics. Libby (1979) employs three major sources of information to inform credit worthiness variables which are financial statement data, management evaluation, and outside credit ratings. When banks dealing with firms, audit reports are reliable information to understand and evaluate firms' ability to repay their debt. Banks are reluctant to give a loan to small and opaque firms not having formal financial statements and audited accounts because there is asymmetric information and especially no establishment of credible credit bureaus in these countries (Sacerdoti, 2005). Allee (2007) asserts that firms with audited financial statements have a higher probability to get credit and lower cost of credit than those without audited financial statement. On the other hand, Uchida (2008) finds

that audited financial statement is insignificant in determinants of relationship closeness and scope of firm-main bank relationship. It means that the transparency of firms does not affect the length and strengthening of relationship between SMEs and main banks. In cases of different underwriting practises in Japan and US, Uchida (2008) concludes that AUDIT could have a positive impact in US and no impact in Japan. In addition, one other factor that supports performance-based lending is international quality certificate. However, the newest research of Uchida (2011) indicates that AUDIT is unrelated to how much the bank pays attention to them. International quality certificate that contributes to the sustainability performance is a criterion for banks to evaluate the growth significance of firm and examine the ability of repayment of debt. Audited financial statement as well as international quality certificate is evaluated by a third party but SMEs in general are not acquainted with disclose financial and management information. So if they have certificate and audition, they may have high quality performance as a result of higher probability to obtain credit. Firms having export activities can use more lending technology to get bank loans than those having only domestic market. Moreover, export is as proxy for firm performance, also it is more likely to raise propensity of probability in access bank loan. We, thereby, attempted to solve the following question:

6. Do credit-worthiness variables contribute to the success in obtaining bank loan?

3. Data, methodology and variables

3.1 Data

The SME data used in this paper comes from World Bank Enterprise Survey and Provincial Competitive Index in Vietnam. The objective of the World Bank Enterprise Survey is to obtain feedback from enterprises on the state of private sector as well as building a panel of enterprise data that will make a change in business environment or impact assessments of reform, etc. Therefore, this Survey will look for information about constraints to private sector growth and create statistically significant business environment indicators which are comparable across countries. Although this data widely relates to firm characteristics, gender participation, access to finance, annual sales, cost of input/labor, workforce composition, bribery, licensing, infrastructure, trade, crime, competition, capacity utilization, land and permits, taxation, informality, business-government relations, innovation and technology, and performance measures, in measure of determinants of SME credit availability is rather limited. Therefore our study did not concentrate on micro and specific problem but considered general factors that might influence SMEs' financing; meanwhile most of the economists do not pay attention to the general picture of this. The advantage of the data, however, is that it was conducted in five regions containing 14 provinces: Red River Delta, the North Centre Coast, Mekong River Delta, South Centre Coast and South East that may be drawn to the different financial patterns across provinces and 18 manufacturing and service industries that industry characteristics may give distinctive inferences in each industry.

3.2 Research methodology

Combining capital structure theory, World Bank data set and objectives of the research, the

logit model was chosen for answering research question. Traditional research on SME access bank loan usually uses probit or logit model. The dependent variables of these models can be dichotomous in nature, take a 0 or 1 value. Okura (2009) applied probit model to the relationship between commercial bank loans for financing working capital, investment capital and firm size, accounting and legal services, export right and government agency's assistant. Besides, Canovas et al (2006) utilized ordinary least square (OLS) and probit model; OLS model analyzes the effects of banking relationship on interest rate paid by the borrower; Probit model examines banking relationship on the guarantees requested. Mercieca et al (2009) uses the multi-nominal logit regression to examine the determinant of the number of bank relationships on SME finance. To analyze the business collateral and personal commitments, Woordeckers and Steijvers (2006) simultaneously use ordered probit model which interprets the relationship between the degree of collateral/commitment protection required by bank and a group of independent variables; and continuation-ratio logit model which investigates two levels: the choice between collateral and non collateral and the choice between business collateral and personal commitments.

Our logit model borrowed the idea from Okura (2009) reviewed other existing studies. The binominal model is used to assess the influence of explanatory variables, which relate to the basic characteristics of firms, financial characteristics and credit-worthiness of firms, on the probability that firms obtain a bank loan. Due to data limitations, we could not take into account many additional specific factors such as relationship lending, political connection, size of bank loan that might influence the SME capital availability. This, of course, caused limitation to the extensive discussion, but no prior study had considered simultaneously endogenous and exogenous variables. Moreover, we apply discriminant and cluster analysis to further analyze what logistic model could not reach.

3.3 Variables

The list of the dependent and independent variables goes together with their definition, number of observation, mean, standard deviation, min and max which are provided in table 1. We considered 5 categories of variables as firm and financial characteristics, credit worthiness variables, industry dummies, and region.

Table 1. Definition and summary of statistics of variables

Variables	Symbol	Definition	N	Mean	Std. Dev	Min	Max
Dependent variable	CREDIT	1 if have a loan, 0 otherwise	1050	0.64	0.48	0	1
Firm characteristics	SIZE	0: Small >=5 and <=19 1: medium >= 20 and <=99 2: Large >=100	1053	1.13	0.77	0	2
	AGE	Firm age (years)	1051	11.75	11.14	0	107
	MACHINERY	MACHINERY=ln(value of purchase machinery, vehicles, equipment in last fiscal year)	632	22.17	2.04	15.94	29.71
	LAND	LAND=ln(value of purchase land, building in last fiscal year)	459	22.86	1.73	16.12	30.34
Credit-worthiness	INTERNALFUND	Proportion of this establishment's working capital financed from internal fund/retained earnings	1035	58.56	35.21	0	100
	BANKFUND	Proportion of this establishment's working capital financed from bank	1037	29.43	31.68	0	100
Financial characteristics	NASALES	Percent of national sales	1049	76.77	38.22	0	100
	INEXSALES	Percent of indirect export sales	1049	6.30	20.73	0	100
	OVERDRAFT	Overdraft facility	1037	0.13	0.33	0	1
	AUDIT	Annual financial statement checked	1046	0.36	0.48	0	1
	IQC	Quality certificate	1036	1.77	0.42	0	1
Industry	OMANUFACTURE	Other manufacturing	1053	0.10	0.30	0	1
	SERVICES	Services	1053	0.11	0.31	0	1
	MANUFACTURE1	Food, textiles, garment	1053	0.35	0.48	0	1
	MANUFACTURE2	Chemical, rubber, metallic, basic metallic, Fabricated metal, machinery, electronic	1053	0.32	0.46	0	1
	RETAIL	Retail	1053	0.12	0.33	0	1
Region	REGION1	Red River Delta	1053	0.31	0.46	0	1
	REGION2	Central North	1053	0.10	0.31	0	1
	REGION3	Mekong River Delata	1053	0.11	0.31	0	1
	REGION4	Southern Central Costal	1053	0.11	0.31	0	1
	REGION5	South East	1053	0.36	0.48	0	1
	PCI	Competitive Provincial Index	1053	62.19	5.89	52.56	75.96

The descriptive statistics in table 1 shows that 64% of firms are in line of credit at this time of the survey. Based on our review of existing studies and the informative limitation of World Bank Survey, firm characteristics include 4 variables as SIZE, AGE, MACHINERY and LAND whose significance were checked in the logistic model. The firm characteristics may not be included the same variables as those in the general previous research while the normal firm characteristics include size, age, legal status and number of bank relationship. The demand of purchase of machinery and land or buildings motivates the probability of obtaining bank loans. Proportion of establishment's working capital financed from non-bank financial institution, moneylenders, friends and relative… and purchases on credit from suppliers and advances from customers account for a small part (12.01%) while the proportion of this establishment's working capital financed from internal fund and banks are 58.56% and 29.43% respectively. So we only added INTERNALFUND and BANKFUND into the logistic model. Although the more recent literature focuses on social capital, we could not reach it mostly because there was limited access to information and it had less significant influence. In addition, we attached the percentage of national sales and indirect export sales to the in-depth analysis. Overdraft facility whose firms use accounts modestly 13% of the total firms is also an instrument contributing to the probability.

The inclusion of annual financial statement checked and international quality certificate explaining the efficiency and stable growth is a factor contributing to SME credit availability. According to the World Bank Survey, there are up to 13 categories of industry, so we shortly divided into 5 categories partly because of short analysis and avoidance of collinearity. The same as the situation of industry dummies, instead of using 14 provinces, we use 5 regional dummies and PCI ranking from 52.56 to 75.96. We included PCI to control the different competitiveness of each province. PCI belongs to the economic growth project funded by the United States Agency. Moreover, one of the three key objectives of PCI is improvement of access to financing for SMEs. So we anticipated that firms operated in good competitive environment were more likely to obtain higher probability of obtaining credit.

4. Survey Results

Descriptive analysis

Capital structure of working capital and fixed assets

Table 2. Mean of proportion of working capital financing by size

	All size	Small	Medium	Large
Internal fund/Retained earning	58.6	70.3	59.3	50.1
Borrowed from bank	29.5	18.8	28.7	37.3
Borrowed from non-bank, financial institution	0.5	0.1	0.7	0.6
Purchased credit from supplier and advance from customers	4.7	2.1	4.8	6.3
Others	6.7	8.7	6.5	5.7

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Table 2 shows that small firms which have more credit constraints than medium and large firms mostly depend on internal fund and social relationship. The bigger SMEs are, the more proportion of bank loan they obtain. Our findings may not coincide with the previous literature, Vietnamese firms (Taussig, 2008) and Chinese and Indian firms (Allen et al, 2005, 2007) with high growth rate actually opt out of the formal financial system. Not at any firm size, financial institutions lend such a tiny proportion.

Table 2 indicates that firms borrowing up to 41.3% from banks, financial institutions, purchase credit from supplier and advance from customers and from others. Of what nearly 30 percent are financed from bank. Comparing with Narayana's (2004) analysis, firms in the entire India borrowed 35 percent for working capital, so the Vietnamese firms are in better conditions to get loan in the financial market.

Bigger firms receive credit from suppliers and offer more advances from customers, which means there is an increase in accounts receivable and a decrease in account payables. Smaller firms have less informative about their borrowing history and volume of sale or purchase is quite low. So their source of capital is limited and then they must take full advantage of owned capital or retained earnings.

Table 3. Percentage of using overdraft facility by size

Items	Small	Medium	Large
Have no overdraft facility	90	87	86
Have overdraft facility	10	13	14

In Vietnam, banks are allowed to decide terms of all loans, and 2002 was the first time the overdraft facility was introduced to public. Nowadays, Vietnamese banking system supplies more diversified services and are on the preparations for the liberation and integration process. However, the government still controls the interest rate and foreign exchange rate. Overdraft facility is a quick loan, helping firms quickly deal with unexpected financial demand in condition of high interest rate but firms can withdraw money to access a loan whenever they want. Overdraft facility is a common financial instrument especially in developing countries, for instance in Sub-Saharan Africa, 40% of firms have a loan overdraft (Dalberg, 2011), while there is quite a small percentage of total SMEs (13%) having overdraft facility in Vietnam. Table 3 shows that firms using overdraft services increase by size. For small and new firms, they use less that is not meaning less demand for overdraft facility because they haven't good financial indicators and payment credit. On the other hand, banks charge businesses with usurious interest rate, so businesses should be cautious to choose overdraft after checking all sources of cash.

Table 4. Mean of establishment's total purchase of fixed assets

Items	Whole of industry	Omanu Facture	Services	Manufactur e1	Manufactu re2	Retail
Internal fund/Retained earning	67.5	58.0	70.5	67.1	67.6	76.8
Owners' contribution or issued new equity shares	7.9	13.6	7.2	7.5	7.3	4.9
Borrowed from bank	17.0	19.6	15.9	16.0	18.3	14.5
Borrowed from non-bank, financial institution	0.5	0.3	0	0.2	1.1	0
Purchased credit from supplier and advance from customers	2.0	2.7	0	2.7	1.7	1.7
Others	5.1	5.8	6.4	6.5	4.0	2.1

Table 4 indicates the proportion of this establishment's total purchase of fixed assets; however, the patterns of financing in fixed asset are somewhat different from financing for working capital. Up to three quarters of internal fund or retained earning are financed for fixed assets due to heavy reduction in credit from supplier channels and adequate reduction on bank loans. However, owners' contributions and new issued equity shares are an additional financing channel for the reduction of bank loans and credit suppliers. These

differences are appropriate with pecking order theory; capital structure of retail and services mainly lies on internal fund than manufacturing industry. External finance accounts only for one quarter of capital formation and equity issues (7.9 percent) are small. The role of equity financing will become more and more important if the financial institutions are developed. While retail sector's fixed asset financed three to fourth capital from internal fund, other manufacture's fixed asset only financed more than a half from internal fund. To cover the shortage of capital, other manufactures mobilize capital from equity. One more existing evidence for pecking order theory is that firms are more likely to prefer debt rather than equity because of lower information cost associated with debt issues. However, each industry has private comparative advantage to choose optimal capital structure, proportion of capital financing of food, textiles and garment industries are nearly as same as that of chemical, rubber, metallic, basic metallic, fabricated metal, machinery and electronic industries. The capital structure of industry with high technology depends less on internal fund and mobilize more new equity share. Contrary to other manufacturers, retail and services sector which are normally characterized by a relatively low level of fixed assets depend mainly on internal fund and borrow relatively less from banks.

Collaterals

Small businesses are perceived as low credit worthiness, so banks often require these borrowers to pledge collateral to guarantee their later payment. However, the property of small businesses often does not satisfy the lenders. In developing countries, lands are most frequently accepted in the formal market.

Table 5. Kinds of collateral by size (%)

Kinds of collateral	All size	Small	Medium	Large
Land, buildings under ownership of the establishment	72.05	71.8	64.1	80.4
Machinery and equipment including movables	49.59	27.5	62.3	70.8
Personal assets of owners	35.77	42.7	45.1	23.0
Other forms of collateral not included in the categories above	4.89	2.7	4.3	6.5

As in the case of Vietnam and in line with the idea, table 5 shows that more than 72 percent use land and buildings as guarantee. Next, machinery and equipment are the second important collateral. Close to 50 percent of businesses use real estate; however, we found that large businesses which pledge real estate account for 70 percent. Comparing small and large businesses, this information indicates that large businesses have more types of collateral compared with small businesses. Specially, almost all small businesses could not have a change to pledge accounts receivables and inventories, compared with 20% of large businesses. There is more variety in types of collateral that large businesses could use as

collateral than small and medium businesses. Small businesses rank land, buildings, and personal assets and then machinery and equipments in descending order of importance in types of collateral, while large and medium businesses rank machinery the second position. The transaction between businesses and banks still bases on collateral, not trust, so banks have not built up a framework of credit business score. If businesses are not frequent or close customers, banks will request businesses to pledge collateral. Nonetheless, when the value of estate market falls down so much in a financial crisis, the loans guaranteed by land or building are more likely to be at risk.

The lender frequently underestimates collateral and then they offer a loan less than the value of collateral. The loan-to-value ratio which is a ratio of value of loan to value of collateral is most usually used to determine the effectiveness of collateral. Each kind of collateral has private loan-to-value ratio. However, the value of loan depends not just only on the type and value of collateral but also lending relationship, purpose of lending. We could not analyze loan to value ratio for private type of collateral based on the existing data, because a part of respondents pick up more than one kind of collateral.

To evaluate the difficulties of access to bank loans

Table 6. Firm size and regional breakdown of SMEs' evaluation obstacles in access bank loan

Size	Obs	Mean
Whole size	1024	1.06
Small	241	1.15
Medium	404	1.18
Large	379	0.86
Regions		
Red River Delta – Region1	324	1.31
Central North – Region2	109	0.99
Mekong River Delta – Region3	116	0.74
Southern Central Costal – Region4	113	1.35
South East – Region5	362	0.86

To evaluate a grade of obstacle that SMEs are facing, the Survey ranks 'no obstacle' for 0, and 'very severe obstacle' for 4. Of course it is generally thought that small businesses meet the most obstacles rather than medium and large size ones. However, the results are somewhat different, the mean of medium businesses' evaluation is 1.18. But the gap of score between small and medium is so small, so it is not significant to draw any conclusion from this data. Large business have more tools to access capital and sufficient collaterals, therefore most of large businesses feel no or minor obstacles in access to finance.

Mekong River Delta, South East and Central North are all regions that have good conditions for SMEs' access to finance. While businesses in the Red River Delta and Southern Central

coastal meet more obstacles than those in the rest of Vietnam. The big gap between two regions should be necessarily considered. Many reports that do not report an overall financing gap between regions come from financial institutions and unbalance between demand and supply. Only the research of Malesky et al (2008) provides the structural controls affecting bank lending in Vietnam which are infrastructure of province, proximity of markets, human capital and market size. His research gives a list of variables, and then concludes which areas are good financial environments. Inversely, our research has advantageously direct indicator to determine which regions are good or bad for SME credit availability. His findings also admit that the Southwest is the easiest environment for loan access and the Northeast including Hanoi is a difficult place to access bank loans due to high competition and low disproportional supply to SMEs. Logit model will check the significance of regional variable.

Probability of obtaining bank loans

Variables and correlations

Table 7. Comparison between group of credit=1 and group of credit=0

Variables	Group credit = 1					Group credit = 0				
	Obs	Mean	Std. Dev	Min	Max	Obs	Mean	Std. Dev	Min	Max
SIZE	668	1.25	0.72	0	2	382	0.91	0.79	0	2
AGE	667	12.47	11.58	1	107	381	10.41	10.12	0	59
MACHINERY	418	22.60	1.94	16.11	29.71	214	21.32	1.95	15.94	26.71
INTERNALFUND	654	47.34	31.31	0	100	379	77.71	33.23	0	100
BANKFUND	656	42.46	30.08	0	100	379	7.03	19.53	0	100
NASALES	667	77.46	36.98	0	100	380	75.42	40.39	0	100
INEXSALES	667	6.48	20.63	0	100	380	6.02	20.96	0	100
OVERDRAFT	657	0.16	0.37	0	1	379	0.07	0.25	0	1
AUDIT	665	0.39	0.49	0	1	378	0.29	0.45	0	1
IQC	654	0.30	0.46	0	1	379	0.12	0.32	0	1
OMANUFACTURE	668	0.12	0.32	0	1	382	0.73	0.26	0	1
SERVICES	668	0.10	0.30	0	1	382	0.13	0.34	0	1
MANUFACTURE1	668	0.34	0.47	0	1	382	0.37	0.48	0	1
MANUFACTURE2	668	0.34	0.47	0	1	382	0.27	0.44	0	1
RETAIL	668	0.10	0.30	0	1	382	0.16	0.36	0	1
REGION1	668	0.32	0.47	0	1	382	0.31	0.46	0	1
REGION2	668	0.12	0.33	0	1	382	0.07	0.26	0	1
REGION3	668	0.12	0.32	0	1	382	0.09	0.29	0	1
REGION4	668	0.12	0.32	0	1	382	0.09	0.29	0	1
REGION5	668	0.32	0.47	0	1	382	0.43	0.49	0	1
PCI	668	61.99	6.02	52.56	75.96	382	62.49	5.63	0	1

Table 7 divides two groups, one group access credit to obtain bank loans and otherwise one group could not access to credit. Clearly, the mean of SIZE, AGE, MACHINERY, BANKFUND, NASALES, INEXSALES, OVERDRAFT, AUDIT, IQC, OMANUFACTURE, MANUFACTURE2, REGION1, REGION2, REGION3, REGION4 in group of access to capital is higher than groups not having in line of credit. Obviously, these variables SIZE, MACHINERY, BANKFUND, OVERDRAFT, AUDIT and IQC are easily explained by theory and literature reviews. However, the mean of NASALES, INEXSALES is unintentionally displayed. Normally, we think that the higher export share, the higher probability of acquiring bank loan is able to achieve. The mean of some variables reveals a big gap, while the mean of other variables does not create the differences. We will check the correlation of each variable in table 8.

Table 8. Correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	Credit	1.00																						
2	Size	0.21***	1.00																					
3	Age	0.9***	0.30***	1.00																				
4	Machinery	0.29***	0.54***	0.23***	1.00																			
5	Land	0.21***	0.46***	0.13***	0.69***	1.00																		
6	Internalfund	-0.42***	-0.22***	-0.12***	-0.25***	-0.21***	1.00																	
7	Bankfund	0.54***	0.22***	0.15***	0.26***	0.21***	-0.77	1.00																
8	Nasals	0.03	-0.36***	-0.05***	-0.15***	-0.22***	0.06	-0.04	1.00															
9	Inexsales	0.01	0.01***	0.05	-0.05	0.03	-0.02	-0.01	-0.47***	1.00														
10	overdraft	0.13***	0.04	0.01	0.11***	0.07	-0.05*	0.08***	-0.03	-0.03	1.00													
11	Audit	0.11***	0.38***	0.21***	0.39***	0.35***	-0.11	0.13***	-0.18***	0.015	0.16***	1.00												
12	iqc	-0.21***	-0.42***	-0.31***	-0.47***	-0.38***	0.19***	-0.21***	0.12***	0.3	-0.08**	-0.35***	1.00											
13	Omanufacture	0.07**	0.10***	0.09***	0.06	-0.01	-0.11***	0.06**	-0.07**	0.05*	-0.00	0.03	-0.05*	1.00										
14	Services	-0.05	-0.09**	-0.04	0.03	0.01	0.07**	-0.05	0.17***	-0.10***	-0.00	-0.01	0.08**	-0.12***	1.00									
15	Manufacture1	-0.03	0.11***	-0.03	-0.08*	0.05	-0.03	0.01	-0.34***	0.14***	-0.03	-0.00	0.05	-0.25***	-0.26***	1.00								
15	Manufacture2	0.07**	0.08**	0.10***	0.05	-0.04	-0.02	0.02	0.12***	-0.03	0.01	0.08**	-0.19***	-0.23***	0.24***	-0.49***	1.00							
17	retail	-0.08**	-0.28***	-0.15***	-0.10**	-0.06	-0.10***	-0.06*	0.23***	-0.11	0.03	-0.13***	0.17***	-0.13***	-0.13***	-0.27***	-0.25***	1.00						
18	Region1	0.01	0.01	0.08***	0.12***	0.11**	-0.03	-0.05	0.02	0.08**	0.02	-0.06**	-0.04	0.05*	-0.02	-0.04	0.05	-0.04	1.00					
19	Region2	0.08***	0.03	-0.04	-0.05	-0.18***	-0.06**	0.05*	0.08***	0.02	-0.04	-0.08**	0.05	0.07**	0.09***	-0.13***	0.01	0.03	-0.02***	1.00				
20	Region3	0.04	-0.09***	-0.02	-0.14***	-0.04	0.01***	0.04	0.08***	-0.04	0.05	0.00	0.08**	-0.04	0.07	-0.35*	-0.00	0.05*	-0.24***	-0.12***	1.00			
21	Region4	0.04	-0.08**	-0.02	-0.10*	-0.12***	-0.04	0.06**	0.02	-0.07**	0.02	-0.05*	0.05	0.02	0.05	-0.22	-0.05	0.04	-0.23***	-0.12***	-0.12***	1.00		
22	Region5	-0.11***	0.8***	-0.03	0.05	0.11**	0.09***	-0.06*	-0.14***	-0.01	-0.03	0.14***	-0.07**	-0.08***	-0.12***	0.18***	-0.02	-0.04	-0.51***	-0.26***	-0.26***	-0.26***	1.00	
23	pci	-0.04	-0.03	-0.06*	-0.01	0.07	0.07**	-0.03	-0.10***	-0.013	0.05*	0.07**	-0.01	-0.06**	-0.08	0.12***	-0.016	-0.02	0.47***	-0.41***	-0.1***	0.41***	0.38***	1.00

Table 8 shows the correlation between dependent and independent variables, most of the correlation coefficients are below 0.3. Only the correlation coefficient between age and credit is 0.9, so we will omit this variable AGE out of our model though this variable is regularly added in nearly all of previous researches. Obviously, we will omit two additional variables - one for industry and one for region. For regional dummy, REGION5 is more likely to be rejected in our model because of the highest coefficient correlation than other regions. To ensure which industry should be deleted in the logit model will be checked to delete in logit model. One problem should be considered is the correlation between machinery and size of firms (0.54). This number is a little higher than 0.5 at moderate level. So it is not necessary to omit variable in logit model.

Table 8 shows that SIZE, AGE, MACHINERY, LAND, BANKFUND, OVERDRAFT, AUDIT, OMANUFACTURE, MANUFACTURE2, and REGION2 are positively and significantly correlated with CREDIT at 0.05 levels. This result resembles with data displaying in table 7 and are in line with the previous researches. While other variables such as INTERNALFUND, RETAIL are, as expected, negatively and significantly correlated, except unpredicted sign of IQC. The sign of this correlation can be explained: firstly CREDIT and IQC are two dummy variables so the correlation is not only significant; secondly (-0.21) is weak to explain the strength of relationship. To prove the significance, the next part will be checked in logit model.

Interpretation results of logistic model

Table 9. Result of logistic estimation – Probability of obtaining bank loan

Independent Variables	General model			Probability by size		
				Size=0	Size=1	Size=2
	Odds ratio	Z	P>|z|	Odds ratio	Odds ratio	Odds ratio
SIZE	1.228	1.02	0.309	-	-	-
1: medium	1.449	1.17	0.243			
2: large	1.508	1.02	0.309			
MACHINERY	1.230	2.72	0.007	1.238	1.53***	1.091
INTERNALFUND	1.003	0.72	0.472	1.001	1.005	0.997
BANKFUND	1.075	8.95	0.000	1.106***	1.106***	1.044***
NASALES	1.010	2.81	0.005	1.019**	1.020**	1.004
INEXSALES	1.004	0.73	0.465	1.025	1.014	0.995
OVERDRAFT	0.297	-2.73	0.006	1.019	8.776**	3.106*
1.OVERDRAFT	3.324	2.70	0.007			
AUDIT	1.021	0.07	0.940	2.691	0.589	1.288
IQC	0.819	-0.96	0.338	0.38	1.112	0.627
OMANUFACTURE	14.63	2.02	0.043	5812318	0.000	1.393e+07
SERVICES	18.40	1.76	0.079	-	0.000	-
MANUFACTURE1	11.842	1.92	0.055	5777709	0.000	1.05e+07
MANUFACTURE2	12.044	1.93	0.054	1076084	0.000	2.21e+07
REGION1	2.644	2.62	0.009	2.929	3.263*	2.022
REGION2	3.889	2.47	0.013	30.315**	3.101	4.075*
REGION3	1.596	1.13	0.257	4.322	0.882	1.771
REGION4	1.765	1.18	0.238	1.349	3.556	2.912
PCI	1.035	1.20	0.232	0.983	1.036	1.04
Number of obs	620			107	250	259
Pseudo R^2	0.3954			0.5186	0.4555	0.3576
Prob> chi2	0.0000			0.0000	0.0000	0.0000

*, **, *** p values associated with correlation significant at the 0.10, 0.05 and 0.01 level respectively.

To judge which variables should be rejected out of logistic model: The p-values associated with correlation of AGE and REGION5 are two high and adding these two variables reduces the value of R squared. In line with the result of table 8, we decided to reject AGE and REGION5 out of logistic model. In addition, the low significance of LAND has similar symptom as AGE and REGION5, so it is also excluded. This indicates that businesses with having credit are intensive in financial characteristics, credit worthiness, industrial dummies, which run and counter the predictions about positive relation between AGE, LAND of business and credit involvement.

Table 9 presents the factors that determine SME credit access. Group 1 introduces the general model of logistic model, whereas Group 2, which was sorted by size and regress, can help us to explain the different coefficient by size. Firm characteristics are not accordance with the

previous study, partly because AGE could not be included, and SIZE is insignificant. The firm characteristics now only include SIZE and MACHINERY. However, the sign of SIZE odds ratio is larger than one that can be explained that the bigger firm are more likely to access capital than small firm. SIZE is a category variable so we could see the discriminative coefficient of medium firms is much higher than that of small firms, whereas larger firms do not create the big gap with medium firms. Switching to the other specific firm characteristic of MACHINERY, it reveals that if in the last fiscal year the business purchases machinery, consequently the business eagerly acquires a bank loan. The Demand and purchase of MACHINERY play an important role in contributing to SME credit availability. Specifically, medium businesses are more likely to highly demand to purchase machinery, therefore the odd ratio (1.53) is significant and higher than small and large businesses.

Regarding financial characteristics, two of five variables BANKFUND, NASALES are significant and odds ratio of these variables are larger than 1; this reveals that businesses with higher bank loan financed for working capital as well as with higher proportion of national sales are more likely to obtain credit. The value of BANKFUND is easily to explain, whereas NASALES is significantly positive but not export sales. To find the reasons supporting this sign of odds ratio, we use the discriminant analysis method. National sales of small businesses account up to 94 percent, therefore the cluster of SME access bank loan will concentrate robustly on the group of national sales rather than export sales. The mean proportion of national sales for group with having credit (77 percent) is higher than that of national sales for group not having credit (70 percent), even all sizes of businesses. Moreover, the mean of export share of each size of businesses having in line of credit (16 percent) is less than those not having credit (18 percent). It could be said that there is no positive correlation between export activity and access to credit for all sizes of businesses. Except for bank channel, export businesses have more sufficient internal capital than non-export businesses and more likely to access credit in alternative channel; whereas non-export businesses have just limited financial channel. Turning back to the national sales by size we found that the odds ratio and level of significance decrease by size. Consequently, the higher national sales for small and medium businesses support to the success of obtaining bank loan while national sales for large businesses is less likely to affect likelihood of access credit. Proportion of indirect export sales is not the main constituting factor for credit access because odds ratio is nearly equal one and less significant. One interesting finding from logistics model is contrary to what we assumed that uses overdraft facility to improve the SME access bank loans. An obvious explanation for the results is that financial market is undeveloped, so using OVERDRAFT is reflected on group not having in line of credit. Though OVERDRAFT is significant, the odd ratio of OVERDRAFT less than one is of some concern. It can be explained that OVERDRAFT is less likely to affect SME credit availability to groups having credit equal zero than groups having credit equal one. There are, however, significant correlation and odds ratio greater than one across all size of business. Medium businesses mostly use overdraft and also strongly and significantly influence credit availability.

Credit-worthiness variable gives different patterns in literature review. As in our study, both of two variables are all insignificant correlation with SME credit availability. The findings of

the study is consistent with the results of Uchida (2011) which shows that financial information does not play the role of guarantee to appraisal loan although breaking down by size reveals somewhat interesting findings. Firstly, regarding AUDIT, the high odds ratio of small businesses may be explained that small businesses are potentially lack of data on past business history and low financial information, therefore AUDIT is really advantageous for small businesses to get bank loans. However, explanation is more unlikely to support large businesses, especially medium businesses. Medium and large businesses may have the means to skip the audit requirements. There exists a popular problem in developing countries with under-developed financial system that audit does not really provide exact information for lenders. So in some cases, AUDIT is statistically a significant correlation between the SMEs with in line of credit, however. Secondly, lenders depend less on the international quality certificate as a sign of appraisal because the p-value of odds ratio is insignificant and the differences between small versus large business credit worthiness variables are statistically insignificant.

As our expectation, the industry dummies are statistically significant in the probability of obtaining bank loans, and the odds ratio of each industry varies. Significant results indicate that SERVICES, OMANUFACTURE, MANUFACTURE2, MANUFACTURE1, RETAIL are efficiently and orderly decreasing in success of obtaining bank loan. The predicted odds for SERVICES are 18.40 times the odds for non SERVICES. The acquiring bank loan is 14.63 times greater for other manufacture than non-other manufacture. The probability of success in acquiring credit for MANUFACTURE1 and MANUFACTURE2 stand behind SERVICES and OMANUFACTURE. Depending on capital demand of each industry associated with capability of fulfilling loan procedure, each industry has private indicators. This indicator is directly related with the proportion of financial leverage of each industry, partly because working capital financed from bank of SERVICES and MANUFACTURE1 (Food, textiles, garment) sector is 24 percent and 35 percent respectively.

Finally, we found that the financing patterns of each region vary with the result findings from descriptive statistics. It is particularly interesting that the Red River Delta and Central North are statistically significant and strongly influence the probability of SME access bank loans. Although Central North is not an economic and a financial centre as the Red River Delta and South East areas, small businesses in Central North, especially, are around ten times more likely to receive credit than medium and large businesses in this area as well as other sizes associated with other regions. This result may suggest that small business lending programme may be directly in favour of small businesses in this area. The PCI measuring economic government does not statistically affect the probability of SME business credit availability.

The results from this regression give some unexpected and unprecedented findings as presented in the literature review. The pseudo – R-squared values (39.54 percent) is relatively sufficient fitted model. Firm characteristics such as size, age are not the main factors to influence SME financing. However, if businesses demand to buy machinery, they will be eager to acquire bank loans. The higher the financial leverage, the higher the probability that businesses have to potentially obtain bank loans. National, indirect export or direct export shares are vague in effect in probability of obtaining bank loans. Breaking down by size,

medium businesses highly adopt facility and positive significant influence SME credit availability. The credit-worthiness variables in terms of audit and international quality certificate may shadow the effect of SME financing. However, industry is of significant importance in explaining which industries have comparative advantage in supplying a loan. Region is also a dummy variable; the probability of accessing credit is higher in the Red River Delta and Central North than in the rest of the country.

5. Conclusions

This paper used World Bank Enterprise Data in 1999 to study factors that affect SME financing. The bigger Vietnamese SMEs are, the more proportion of bank loan SMEs obtain which are inconsistent with the conclusion of Taussgig (2008) and Allen et al (2005, 2007). In addition, it is easier for Vietnamese businesses than Indian businesses in regards of access credit. In acquiring capital assets, internal funds, retained earnings and equity are preferable, therefore high debt portion in capital structure is highly reduced in capital assets compared with working capital. With respect to other manufacture, mobilizing capital from owner's capital or issued new equity shares double the other industries. Depending on potential asset, small businesses choose land, building and personal assets and then machinery and equipment as descending order important types of collateral whereas large and medium business rank machinery as a second position.

Our logistic model classifies into five groups of factors: firm characteristics, financial characteristics, credit-worthiness, industry dummy and region dummy. The probability of accessing credit appears to be positively related with MACHINERY, BANKFUND, NASALES, whereas negatively related with OVERDRAFT. Although logit model reveals that the business with higher proportion of national sales is more likely to obtain higher probability of access credit. Nonetheless proportion of national sales is not significant with large business in access credit. Overdraft facility is relatively less likely to use in Vietnamese financial market compared with Indian and China financial market. Interestingly, firms using overdraft facility increase by size. Our model implies that credit worthiness variables do not have an effect on lenders' appraisal criteria and inconsistent with some studies but consistent with Uchida's (2011). This finding is obviously appropriate with real situation in Vietnam where businesses have two book-keepings; one for real operation and other for tax collector, so AUDIT is relatively low creditworthiness. Real situation of financial statement audit is similar to international quality certificate which is consistent with Le's conclusion (2011).

Industry is of significant important to understand the probability of acquiring bank loans in each industry. SERVICES, OMANUFACTURE, MANUFACTURE2, MANUFACTURE1 and RETAIL are orderly descending probability of access credit. In order to successfully carry out preferential financial scheme, the odds ratios relatively reveal the comparative capacity to access bank loan of each industry. There is a room for analyzing the financial pattern disparities of each region in Vietnam. Though businesses in the Mekong River Delta and South East meet with fewer obstacles than other regions, these regions do not significantly influence our logit model. However, the Red River Delta and Central North are positively significant and specifically, small businesses located in Central North have

extremely high probability to obtain bank loans that is consistent with the descriptive analysis. It could be the consequence of differences in effectiveness of small and medium associations and sufficient supply that give better financial environment. Deep investigation of the situation in Central North can be possible to get lessons for other regions in terms of financial support for small businesses.

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