

Print ISSN: 2288-4637 / Online ISSN 2288-4645
doi:10.13106/jafeb.2021.vol8.no9.0079

Determinants of Access to Green Finance in Vietnam: An Empirical Research

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Received: May 15, 2021 Revised: July 24, 2021 Accepted: August 02, 2021

Abstract

Green finance plays an important role in environmental protection missions and fighting climate change. The Environment Fund in Vietnam is the main channel of preferential capital offered to firms for environmental protection. Unfortunately, it was previously unknown which criteria influenced these companies' ability to obtain green financing. Using a survey method, we collected data through a structured questionnaire of 203 respondents that represent firms that had received concessional loans from 26 Environment Funds. A Multiple Linear Regression model was used to examine the determinants of access to concessional loans for environmental protection. We found relationships between age, size, ownership type, and industry sector, and access to green finance. Third-party guarantees were a significant factor in financing through Environment Funds. Moreover, we found commercial environmental projects face fewer green financing obstacles. Surprisingly, showing audited financial statements does not mitigate the information asymmetry between firms and these financial institutions. These findings suggest that Environment Funds should classify environmental project types to develop appropriate lending policies. In emerging markets, enterprises need to build a trusted relationship with financial institutions so that they can replace asset-based lending techniques, thereby increasing the firms' accessibility to green finance.

Keywords: Concessional Loan, Environment Fund, Green Finance, Vietnam

JEL Classification Code: G23, O13, Q56

1. Introduction

Environmental protection and climate change are urgent issues in our modern society. The world is making strides against ever-increasing global temperatures, and green finance plays a crucial role in these challenging circumstances (Campiglio, 2016). There are many types of institutions that provide financial support both in individual countries and on a global basis. While there are many financial mechanisms available, a lot of countries use the environmental fund as an organizational means for channeling the capital for the purpose of the prevention

of pollution. An environmental fund is a specific type of thematic fund. It is a fund that invests in companies operating in alternative energy, water purification, waste management, energy efficiency, carbon emissions, or forestry. Environment Funds are organizations established not only in developing countries but also in developed countries to overcome the failures of the market on financing for environmental protection (Akihisa, 2008; OECD, 2015, 2018; Oh & Kim, 2018). Depending on the financial market development, nations may introduce legislation regarding suitable financing policy. In economically developed countries, for example, subsidies and grants are the most important instruments for green financing, while preferential loans are the favorite instrument of poorer, developing countries for environmental protection (Hossain, 2018; Park & Kim, 2020).

Vietnam is currently enjoying an emerging economy in Asia, with high industrialization growth, but limited financial development (Bui, 2020). Therefore, the environment is experiencing the high impact and pressures of atmospheric challenges such as pollution, downgrade, and climate change. To combat these problems, the government

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created a financing policy that supports environmental projects through an entity called “Environment Fund”, which was first introduced in 2002 by the Environment Law. The Environment Fund is a state-owned institution and the main channel for financing environmental investment in Vietnam. Concessional loans with lower interest rates are one of the main instruments of the Environment Fund, comprising more than 95% of its total activity. According to the authors’ calculation, there is one Vietnam Environment Fund allocated on a national level, but there are 47 provincial Environment Funds distributed on the local level. In terms of local Environment Funds, however, there exist only 25 funds that have the capacity of concessional lending activity. The financing activity results of these Environment Funds are shown in Table 1.

According to a demand-and-supply perspective, the demand for investment for environmental protection is high, but the capacity of the Environment Funds is still low. One of the reasons is that enterprises’ ability to access preferential loans is still limited. However, it has been previously unknown as to which determinants affect firms’ access to concessional loans from Environment Funds.

As we were searching for answers, we discovered that previous studies mainly focused on the determinants of the firms’ access to both formal and informal sources of financial support such as preferential loans for poverty reduction and student loans, but there had been no research concerning the accessibility to green finance or concessional loans for environmental protection (Le, 2012; Luc, 2018; Nguyen, 2020; Nguyen et al., 2018; Nguyen & Luu, 2013). Compared with the above-mentioned research, the accessibility to green finance in Vietnam has several differences including a lending policy with low-interest rates (< 50% commercial interest rates), project applications that are specifically tied to the environmental protection field, and lenders that are state-owned institutions. Based on the aforementioned academic literature, we initiated our research to elucidate the main factors affecting the accessibility of green finance.

Within the context of an emerging economy in Vietnam, this study aimed to examine the main criteria impacting the firms’ access to preferential loans from Environment Funds. Specifically, we determined the relationship between the firm’s characteristics (including age, size, ownership type, and business type) and access to concessional loans for environmental protection. We also investigated the influence of having audited financial statements, collateral methods, and how the types of projects affected accessibility to green finance.

The study illuminated some remarkably interesting data compared to previous research. Our analysis makes an important contribution to the field of green finance in developing nations. The identification of influencing factors to access green finance helps the firm to become aware of financing constraints and access requirements, thereby enhancing their chances of grant success. Moreover, environmental lending organizations can gain deep insight related to the approval process of preferential loans, as well as the development of appropriate lending policies.

This paper is organized into six sections, as follows: Section 1 gives a brief overview of green finance and the research gap. The second section is the literature review and hypotheses statements that were developed by the authors. In the third section data, collection and methodology are presented. Results of the Multiple Linear Regression model are analyzed in section 4. Section 5 describes our discussion of findings. Conclusion and implications are drawn in the final section.

2. Literature Review and Hypotheses

2.1. Age of Firm

Various studies have pointed out that the age of the firm (and consequently, its perceived stability) is one of the main factors affecting the accessibility to credit. Start-up firms normally do not get their initial loans from the banks, hence there is no record related to loan repayment,

Table 1: Results of Concessional Lending via Environment Funds

Level	Environment Funds	No. of Funds	No. of Loans	Total Amount (Billion VND)
National	Vietnam Environment Fund	1	314	2,932
Local	Funds with a lending capacity of greater than 100 billion VND	5	163	870
Local	Funds with a lending capacity of less than 100 billion VND	20	104	526
Local	Funds unable to issue loans	22	0	0
	Total	48	581	4,328

VND: Vietnamese Dong.

Source: Authors’ calculation from Environment Funds’ reports accumulates by January 2020.

putting the banks in a difficult position vis-à-vis lending decisions (Kirschenmann, 2016). Similarly, research shows that older firms might more easily receive financing from the banks due to their long credit history and greater tangible assets. That means older enterprises have lower information asymmetry than younger firms (Ferri & Murro, 2015). Furthermore, older firms may have a relationship with financial institutions, allowing them to obtain more loans than the younger firms (Uchida, 2011). Additionally, the older firms may have established a trusted relationship with various financial institutions, which translates into more loan approvals than are granted for younger firms. Beck et al. (2006) argued that younger firms may exhibit high demand investment - cash flow sensitivity, thus these firms encounter higher financing obstacles. In general, the above-mentioned research indicates that the older firms may have more transparency and lower information asymmetry, so they often face fewer financing constraints to access credit. Therefore, we hypothesize that the age of the firm may be positively related to its ability to obtain green financing.

H1: As age increases, firms are expected to have easier access to green finance.

2.2. Size of Firm

Many empirical studies investigated the relationship between firm size and access to finance and found that the larger firm may face fewer financing obstacles than the smaller firm. Small firms are normally informationally opaque and face more constraints than large companies, as a consequence small enterprises show lower information transparency (Berger & Udell, 2002). Moreover, Cenni et al. (2015) in their study found out that larger firms show better credit quality and they face less credit rationing. Similarly, larger firms have more tangible assets which enable the banks to have higher confidence in loan approval (Gompers, 1995). Harrison & McMillan (2003) argued that larger firms simply reflect the fact that they are more profitable and therefore less credit-constrained than small firms. Ho et al. (2020) showed that larger firms that produce higher profitability usually enjoy a higher probability of loan approval. Based on the above literature, we suppose that there exists a positive relationship between the size of the firm and access to green finance.

H2: As the size increases, firms are expected to have easier access to green finance.

2.3. Legal Forms of Ownership

Following the Enterprise Law of 2014, there are five main types of legal forms of ownership in Vietnam; these include state-owned companies, private companies, partnership companies, limited liability companies, and

joint-stock companies. In Vietnam, several previous investigations were conducted to assess the impact of legal forms of firms on access to finance (Do et al., 2019; Nguyen & Luu, 2013; Rand, 2007; Thanh et al., 2011). Beck and Demirguc-Kunt (2006) and Hainz and Nabokin (2013) showed that ownership of enterprise is one of the most trustworthy predictors of firms' financing. According to Rand (2007), shareholding companies are less constrained to credit than smaller household enterprises. Similarly, El-Said et al. (2013) argued that all the legal forms of companies face high constraints in access to finance, except for joint-stock companies which have a positive relationship with accessibility to banking facilities. Within the context of Vietnam, we argue that joint-stock ownership provides a tighter organizational structure and the ability to mobilize capital from shareholders, thus they have a better capital capacity, a better credit rating, and less financing constraints from banks than other legal forms of incorporation. Therefore, we expect that the joint stock company may have a positive relationship with access to concessional loans for environmental protection.

H3: Joint-stock firms are expected to have easier access to green finance.

2.4. Business Type

A firm's business sector may be considered a reliable factor when examining accessibility to finance. Beck et al. (2006) found that firms in manufacturing tend to be larger so they face fewer financial obstacles. According to Silva and Carreira (2010), firms with more physical assets may find it easier to get finance than enterprises in the service sector with "human capital," due to the collateral requirements of the banks. That means firms in industries with more tangible assets such as equipment and machines are likely to have fewer financing constraints. At the same time, financial institutions are likely to lend to growth industry sectors or business types that are eligible for preferential policies from the government. Levine (2005) ascertained that the availability of external finance has a high impact on the machinery and manufacturing industry due to high-level growth in this sector.

Nguyen and Luu (2013) found that export firms face fewer financing constraints due to incentives policy from the government. With regard to Vietnam, firms in the environmental sector need to invest in equipment and machines, with the side benefit of acquiring the ability to present more tangible assets to financial institutions. The environmental sector is also a large growth industry with various supporting policies from the government related to tax law, technology, human resources, and investment capital. Therefore, the author contends that companies with a

main business in the environmental sector may benefit more from favorable government regulations and are more likely to face fewer financing constraints than companies in other industries when it comes to green finance.

H4: Firms having a core business in the environmental sector are expected to have easier access to green finance.

2.5. Having Audited Financial Statement

Firms providing audited financial statements may experience reduced information asymmetry between firms and the banks (Berger & Udell, 2002). Audited financial statements are reliable information that banks can trust (Baas & Schrooten, 2005). Moreover, according to the study of Gamage (2011), firms in South Asia face higher financing constraints because they lack proper financial records even though they may retain multiple financial statements. Hainz and Nabokin (2013) found that firms seeking to become more transparent report their balance sheets by a legally recognized auditing company, which in turn may increase their accessibility to financing. Because of trustworthiness and for transparency reasons, we hypothesized that firms having audited financial statements may find it easier to obtain green finance from Environment Funds.

H5: Firms that provide audited financial statements by an independent auditor are expected to have easier access to green finance.

2.6. Collateral Method

Through the research of Rahman et al. (2017), the authors discovered that availability of collateral was a positive signal for a bank lending to firms, with the collateral providing evidence of a borrower's loan repayment capacity, increasing the level of confidence of banks approving loans to the firms. Because of issues of opaque information and weak enforcement of debt collection, especially in emerging markets, financial institutions may apply an asset-based lending policy in which credit judgments are much based on the quality of collateral's assets (Berger & Udell, 2002). Moreover, the collateral requirements of banks are one of the highest financing obstacles following the research of Beck et al. (2006). In developing countries, formal financial institutions apply the third-party guarantee as a substitute method for collateral requirements. This helps to reduce the lender's potential loss against any perceived risk. The third-party guarantee also has some economic benefit because these institutions may help the lenders in terms of monitoring and tracking the borrower's operation (Menkhoff et al., 2012). Because the bank's guarantee method is a safer bet than other forms of security, we expect to find a positive relationship between the firm using bank guarantee and getting finance from Environment Fund. Therefore,

we argue that firms collateralized by bank guarantee may face fewer constraints in access to concessional loans in Environment Funds.

H6: Firms that pledge collateral by a bank guarantee method are more likely to have easier access to green finance.

2.7. Type of Project

According to Vietnam's Environment Law, a list of environmental projects was established that are eligible to receive financing from the Environment Fund. Within the list, these ventures may be classified under two distinct headings: commercial projects and non-commercial projects. This may further be defined as commercial projects in which investors receive financial benefits through revenue sharing, as distinguished from non-commercial projects which provide no dividends. If an investor is able to share in the profits of a commercial venture, the Environment Fund has some insurance for getting paid back, and as the risk is reduced, lenders may feel more at ease in offering financial assistance. In contrast, for non-commercial projects, businesses must use other sources of revenue to pay for loans, therefore the probability of getting financed through the Environment Fund is more difficult.

La Rocca and Baietti (2012) argued that environmental projects often face difficult obstacles in gaining access to green finance. There are two main reasons: (1) First, environmental projects are not financially attractive (having exceptionally low, or no profitable returns) in comparison to other investments (with higher return), and (2) Second, there may be a capital availability gap, as private capital does not like these projects. Similarly, OECD (2007) found that different types of environmental projects present distinctive characteristics, for example, there are projects that are financially viable and profitable, while others are only effective from a socio-economic viewpoint. Overall, because of their commercial status and profit-bearing projects, firms that produce revenue are more likely to have repayment capacity, and are therefore more likely to have higher access to green finance.

H7: Firms that fall within the commercial project category are expected to have easier access to green finance.

3. Data and Methodology

3.1. Sample and Procedure

First, we collected the lending activity reports from the Environment Funds. In this stage, we gained a better understanding concerning the lending activities of the Environment Funds. Of 48 national and provincial Environment Funds, only 26 Environment Funds have lending activities. Based on the lending activity results

of these 26 Environment Funds, we divided them into 3 groups: (1) National: Vietnam Environment Fund having the highest lending capacity, (2) Local: 5 Provincial Environment Funds having lending capacity of more than 100 billion VND each, and (3) Local: 20 Provincial Environment Funds having lending capacity of less than 100 billion VND each. We allocated the number of samples (and thus, surveys) within these 3 groups to ensure representativeness. The number of samples in each group is demonstrated in Table 2.

The data of the study was collected through the survey method using pre-structured questionnaires (Appendix Section). We obtained the lists of firms that borrowed the loans from these 26 Environment Funds and randomly selected the firms in these lists in accordance with the sample size as mentioned above. Our respondents were the high-level managers of the firms.

A total number of 220 questionnaires were sent out to the borrowing firms, with the total number of collected samples being 210. The data collection occurred over a 4-month period between January and April 2021. The data entry process was conducted two times independently of each other. After entering the data twice, the authors made a comparison to ensure that there were no errors in the entry process. After removing 07 incomplete questionnaires, the total number of samples for analysis was 203.

3.2. Model Specification and Variables

The model for this research is of the form:

$$\text{Loan Amount}_i = \beta_0 + \beta_1 \text{Age}_i + \beta_2 \text{Size}_i + \beta_3 \text{Ownership}_i + \beta_4 \text{Environment}_i + \beta_5 \text{Audit}_i + \beta_6 \text{Guarantee}_i + \beta_7 \text{Project}_i + \mu$$

Where: $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6,$ and β_7 are parameter estimates and μ_i is the error term.

Previous studies utilized the size (value) of the loan as a proxy to measure the accessibility to finance (Cressy &

Toivanen, 2001; Rahman et al., 2017). These researchers argued that successful borrowers might receive larger loans because they have a better credit quality, lower information asymmetry, lower risk, and a higher level of asset intensity for the collateral requirements of banks. In this model, we also analyzed the loan amounts of the firms that were obtained from Environment Funds, as a proxy for the accessibility to green finance and determined to what extent the age of the firm, the size of the firm, its legal business structure, its main environmental focus, as well as having audited financial statements, collateral provisions, and types of project initiatives were related to access to green finance. Table 3 defines the variables and how they were measured.

4. Results

4.1. Multicollinearity and Descriptive Statistics

We tested multicollinearity by correlation matrix and Variance Inflation Factors (VIF). Table 4 shows that there is no absolute correlation value greater than 0.8 and there is also no VIF value near 10. Therefore, we concluded that the model does not exhibit the multicollinearity phenomenon.

The quantitative variables of the survey show some interesting information (Table 5). The loan sizes ranged from 0.1 billion to 64 billion VND, with the mean (\pm SD) being 15.2 (\pm 12.3) billion VND. Surprisingly, none of the 203 businesses had been in operation for less than four years, with the oldest being 41 years old. The mean (\pm SD) age of firms was 14.9 (\pm 8.3) years. The average total assets among the firms is approximately 245 billion VND, and the largest firm has around 66.000 billion VND.

The firms pledged two types of collateral to Environment Funds: one method involves third-party guarantees (normally by the bank guarantees) with a secondary method of mortgaging business or personal property. The bank guarantee method was used by 70.94% (144 firms). There were 139 firms that had environmental protection as their core business, accounting for 68.47% of businesses in our survey. Out of 203 firms, there were 123 (60.59%) firms

Table 2: Distribution of the Sample Size Involving 26 Environment Funds

Environment Fund	No. of Funds	No. of Firms	Total Sample	Ratio Sample
Vietnam Environment Fund	1	120	120	55%
Local Environment Funds with a lending capacity greater than 100 billion VND	5	12	60	27%
Local Environment Funds with a lending capacity less than 100 billion VND	20	2	40	18%
Total			220	100%

VND: Vietnamese Dong.

Table 3: Variable Definitions

Variables	Description
Loan Amount	Value of the concessional loans in billions of Vietnamese dong (VND).
Age	Number of years that the firms have been in business.
Size	A proxy variable calculated by the natural logarithm of the value of total assets on 31 December 2020.
Ownership	Dummy = 1 if the legal form of ownership is Joint Stock Company and zero otherwise.
Environment	Dummy = 1 if the firm had its core business in the field of the environmental sector and zero otherwise.
Audit	Dummy = 1 if the firm had the audited financial statements at the time application for the concessional loans and zero otherwise.
Guarantee	Dummy = 1 if the firm's application to the Environment Funds by commercial bank's guarantee (third-party guarantee) and zero otherwise.
Project	Dummy = 1 if the firm's project was a commercial environmental project and zero otherwise.

Table 4: Correlation Matrix and Variance Inflation Factor of the Predictors

Predictor	Age	Size	Ownership	Environment	Audit	Guarantee	Project
Age	1						
Size	0.514	1					
Ownership	0.186	0.314	1				
Environment	-0.009	-0.086	0.132	1			
Audit	0.265	0.349	0.154	0.113	1		
Guarantee	0.174	0.241	0.173	0.082	0.181	1	
Project	0.219	0.254	0.060	0.141	0.330	0.061	1
VIF	1.388	1.648	1.155	1.089	1.262	1.095	1.186

VIF: Variance Inflation Factor.

Table 5: Description of the Quantitative Variables

Variables	Mean	SD	Min	Max	Observations
Loan Amount (billion VND)	15.2	12.3	0.1	64	203
Age (years)	14.9	8.3	4	41	203
Size (\log_e of total assets)	5.5	1.6	0.9	11.1	203

SD: Standard Deviation; VND: Vietnamese Dong.

undertaking commercial environmental projects. Almost all of the financial statements of firms were reviewed by a certified auditor when applying for the loans in the Environment Fund (172 firms, accounting for 84.73%).

4.2. Empirical Results

The study applied a Multiple Linear Regression analysis to test the hypotheses. Overall, the model result in Table 6 is statistically significant ($R^2 = 0.572$, Adjusted $R^2 = 0.556$, F Statistic = 37.169 with p -value < 0.01). This model

explains roughly 57.2% of the variance in the accessibility to green finance. The model also shows that the p -value for the F -test is below 0.01 and thus the overall model is statistically significant. Again, this means that the model is better than a model where all the predictor variables equal 0 - which is what we should expect to find. Finally, by plotting the coefficients of our research, we show that the statistically significant results are supported by a 95% confidence interval.

According to the results, the age of firms positively related to the loan amount ($p < 0.001$). That means for a

Table 6: Results of the Multiple Linear Regression Model

Predictor	Dependent Variable: Loan Amount	
	Regression Coefficient	Standard Error
(Intercept)	-11.48***	2.34
Age	0.62***	0.08
Size	1.12**	0.48
Ownership	5.20***	1.33
Environment	3.71***	1.20
Audit	-1.01	1.80
Guarantee	4.08***	1.33
Project	6.59***	1.28
Observations	203	
R^2	0.572	
Adjusted R^2	0.556	
Residual Std. Error	8.211 (df = 195)	
F Statistic	37.169*** (df = 7; 195)	

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

one-unit increase in age, firms are expected to have access to an additional 0.62 billion VND, while controlling for other variables. In other words, older firms are expected to have a better chance of getting green finance than younger firms. Therefore, hypothesis 1 was supported.

Second, the model shows a positive relationship between firm size and access to green finance ($p < 0.05$), supporting hypothesis 2. A 10% increase in a firm's total assets leads to an increase in the amount of loan by 0.11 billion VND [$1.12 * \log_e(110/100)$]. This value suggests that as the total assets of a firm increases, the firms may receive higher loans from Environment Funds.

Third, there is a positive relationship between ownership and loan amount ($p < 0.01$), supporting hypothesis 3. The joint-stock firm's loan values are predicted to be 5.20 billion VND higher than other legal forms of ownership. That means that joint stock firms have easier access to green finance than other types of companies.

Fourth, the results also supported hypothesis 4 with a p -value < 0.01 . Firms whose core business is in the environmental sector, are expected to obtain 3.71 billion VND higher loan size than firms conducting business in other industries. That means that environmental firms are more likely to gain access to green finance than other types of companies.

Fifth, having audited financial statements negatively related to access to green finance, but this finding was not statistically significant. Therefore, hypothesis 5 was not supported.

Sixth, hypothesis 6 was supported by the model results (p -value < 0.01). We interpreted that firms pledging collateral as a third-party guarantee were expected to receive as much as 4.08 billion VND in additional funding than firms using other collateral methods.

Finally, there is a positive relationship between firms having commercial environmental projects and loan amount ($p < 0.01$), supporting hypothesis 7. Firms having commercial project types are expected to receive 6.59 billion VND higher than other firms. This value means that firms presenting commercial projects have a distinct advantage over other enterprises when applying for concessional loans from Environment Funds. The regression coefficient of the project type is the highest value parameter, so the influence of the commercial project factor on the model is the largest.

5. Discussion

Green finance plays a crucial role in the country of Vietnam in the fight against climate change. Within the context of an emerging economy in a developing country, our study examines the determinants to access green finance from the firm's perspective. Our findings show that there is a positive relationship between firm characteristics (age, size, ownership legal form, firm in environmental sector) and access to green finance. The collateral method by third-party guarantee (bank guarantee) is safer than other methods, so firms utilizing some form of bank guarantee have an easier, more streamlined experience obtaining loans from the Environment Fund. Commercial environmental projects have an edge over non-commercial projects in terms of access to green funding because they generate revenue.

Regarding the positive association between the age of enterprise and its ability to obtain green finance, our study correlates well with previous investigations (Beck et al., 2006; Musamali & Tarus, 2013; Schiffer & Weder, 2001). Moreover, according to Le et al. (2006), our research shows a similar agreement that enterprises in a later growth stage will have easier access to credit than enterprises in the early stage. In contrast, Nguyen and Luu (2013) indicated that the long operating time of a firm does not help them overcome the obstacles to access finance. Meanwhile, Rand (2007) explained that long-term enterprises are usually very stable and often have their own capital, thus have less demand for external finance than younger firms. However, we argue that even with the high internal capital of older firms, if they are eligible for the preferential loans from the Environment Funds, they tend to borrow the money because of low interest rates ($< 50\%$ market interest rates).

There are various previous studies that supported our findings with regard to the positive relationship between the size of the firm and accessibility to green finance. As suggested by Thanh et al. (2011), small enterprises

face higher obstacles to access finance. Similarly, Uchida (2011) also used total assets as a proxy for the size of the enterprise and indicated that firms with large assets increase the relationship factor which leads to easy access to loans. Beck et al. (2006) also suggested that small and medium-sized firms have greater barriers to access green finance than large enterprises. Many other studies also have completely agreed with our findings (Musamali & Tarus, 2013; Schiffer & Weder, 2001).

Joint-stock companies have a positive relationship with access to green finance. That means other legal forms of ownership such as limited liability companies, private companies, and partnership companies face higher green financing constraints. In the context of Vietnam, we explain that joint-stock companies have a tighter organizational structure, are more transparent, and possess a higher capital capacity by having many shareholders, therefore it is likely easier to gain access to green finance. This finding fits well with Nguyen and Luu (2013), who stated that joint-stock companies face fewer financing constraints than other types of ownership. In contrast, this result is inconsistent with the earlier findings of Beck et al. (2006) and Harrison et al. (2004). They claimed that state-owned enterprises are less affected by financial access barriers than other entities because they enjoy “preferential treatment” from state financial institutions. Our research contributes an important implication that Vietnam is gradually experiencing a more transparent financial system in which state-owned enterprises are not favored as before. Further research is needed to elucidate differences between forms of ownership in access to finance.

Firms in the environmental sector are expected to have easier access to green finance than other firms. We argue that the environmental industry is a growth sector in Vietnam with many preferential policies from the government such as tax abatements or concessional loans from the Environment Funds. As they take advantage of readily available information by constantly working with environmental state agencies, and have a much better understanding concerning governmental policies. These businesses often have easier access to loans. In contrast, firms operating in other fields but having environmental protection projects will face higher constraints in accessing loans from Environment Funds. Our explanation was supported by previous findings in the literature that firms having incentives from the government and being classified as a growth industry may have easier access to finance. For example, Nguyen and Luu (2013) argued that export firms face fewer financing constraints due to incentives policy from the government. Levine (2005) noted that high-level growth in this sector may face less constraint than others. Moreover, environmental sectors firms must invest in more tangible assets, with ownership

of more physical assets translating into easier-to-get finance (Silva & Carreira, 2010).

Surprisingly, having audited financial statements does not help the firms face fewer constraints in access to green finance. This confirms previous findings in the literature. Malesky and Taussig (2009) support the author’s finding when stating that financial institutions in Vietnam do not pay much attention to firm performance or even the estimated value of the business through the profit ratio of the enterprise in the financial statements. Uchida (2011) and Le (2012) also argued that creditworthiness is not used much in appraisal activities of lending institutions. This finding is also consistent with the reality of emerging economies, where businesses keep multiple books, one of which is the actual book that records business activity and another for the tax authority, resulting in a poor level of audit report credibility and true accountability (Gamage, 2011; Le, 2012). On the other hand, in developing countries with an underdeveloped financial market, the information is opaque therefore financial institutions normally use asset-based lending technology (Berger & Udell, 2002). Instead of looking at financial statements, they pay much more attention to the value of tangible assets of the firms.

Third-party guarantees (bank’s guarantees) are positively related to access to green finance. This means that bank guarantees are a substitute method for loan security related to financing approval by the Environment Funds. Because each of the Environment Fund has only one head office, there are no branches spread across the country like commercial banks, so bank guarantees solve 2 problems: (1) easier debt collection if the risk occurs, and (2) with the advantage of a branch network, banks may easily monitor the customers’ operation. This finding matches well with Menkhoff et al. (2012) in their research on emerging markets. Do and Iyer (2003) stated that more than 90% of loans are secured by tangible assets such as real estate, equipment, and machines. That means the safer the collateral method, the higher probability of loan approval. This finding is in line with Rahman et al. (2017) that the more secure the collateral, the higher the confidence of financial institutions in approving loans, and thus less financing constraints on the part of the borrower. This finding also fits fairly well with the reports of Uchida (2011) and the concept of small financial institutions linking the bank guarantee with their credit decision.

Finally, there is a positive relationship between the firms having environmental commercial projects and access to green finance. This may be explained by commercial environmental projects’ generation of revenue, and having the repayment resources for the Environment Fund. In contrast, non-commercial projects not only lack revenue but must rely on other sources to repay the debt to the Environment Fund. This finding correlates well with the research of Baietti

et al. (2012), who demonstrated that non-commercial projects have difficulty obtaining financial backing, with commercial projects having many more advantages. As proposed by Anderson and Zyllicz (1999) and OECD (2007), the evidence we found points to the idea that the Environment Funds should classify environmental projects and create more suitable loan packages.

6. Conclusion and Implications

The characteristics of firms that affect accessibility to green finance include age, size, legal form of ownership, and main business sector. Our study also found that the bank guarantee method helps firms more easily to obtain green finance. It is also a substitute method for collateral requirements in emerging markets, both to increase access to loans and ensure economic efficiency. There is a marked difference between non-commercial projects and commercial enterprises in their ability to gain access to green finance.

This study mainly contributes some important information having managerial implications: First, green finance needs to clearly classify the type of project to make reasonable lending decisions and policymaking. Second, for emerging markets, firms need to build more confidence with financial institutions. That can lead to financial institutions applying modern lending technology based on firms' financial statements as well as utilizing credit scoring techniques instead of asset-based lending, as is the present circumstance. Finally, there should be more incentives to support enterprises that are not active in the environmental sector but carry out environmental protection projects to achieve sustainable development.

There are two issues that need to be further developed in subsequent research: The first concerns obtaining a larger sample size of the population as data collection becomes more streamlined. The second concerns the other side of the lending-borrowing equation. While this study only considers the determinants of access to green finance from the viewpoint of the borrowers, the financing constraints from the viewpoint of the lenders need to be examined in the future.

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Appendix: The Questionnaires for Survey

Question 1: The age of the firm from which it was established to now is: ... (years).

Question 2: The total assets of your firm following the financial statements on 31st December 2020 is: ... (VND billion).

Question 3: The legal forms of ownership of your firm following the Enterprise Law 2014:

- (1) Joint Stock Company
- (2) Other

Question 4: The main type of business of the firm is in:

- (1) Environmental Sector
- (2) Other

Question 5: Are the financial statements of the firm audited when borrowing loans from the Environment Fund?

- (1) Yes
- (2) No

Question 6: Loans that received from the Environment Fund is collateralized by:

- (1) Commercial Bank Guarantee (Third-Party Guarantee)
- (2) Mortgage Property

Question 7: The type of project is a commercial environmental project with a source of revenue:

- (1) Yes
- (2) No

Question 8: Total loan amount that your firm borrowed from the Environment Fund is: ... (billion VND).