

Green Finance Adoption Using Planned Behaviour Theory: The Case of Vietnam

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Abstract

This paper examines the motivation of firms in Vietnam to access green finance as opposed to traditional finance. It aims to identify the intentions behind accessing green finance and develop a model of factors influencing these intentions. The research addresses the limited participation of smaller economies like Vietnam in the global green finance market, despite an increasing demand for sustainable development. A successful green transformation requires substantial capital, and a well-structured financial market is crucial for this effort. Therefore, this study seeks to understand what drives firms in developing economies to adopt green finance. The research is based on a survey of 50 Vietnamese firms across various industries. Using pre-structured questions, it applies the Planned Behavior Theory (PBT) to create a model explaining the intention to adopt green finance. Factor analysis and logistic regression are employed to identify the main factors influencing these intentions. Results show that a positive attitude toward green finance, due to benefits like enhanced reputation and reduced financing costs, significantly affects firms' intentions to adopt green finance. Internal stakeholders, such as employees and shareholders, are key motivators, while external pressures may serve as obstacles. Interestingly, the availability of finance sources and stakeholder support did not emerge as significant predictors. The study suggests that policymakers should develop supportive regulations and that firms should engage internal stakeholders and increase awareness of green finance's benefits to promote its broader adoption in emerging economies like Vietnam.

Keywords: green finance, emerging economies, planned behaviour theory, corporate finance, corporate governance.

1. Introduction

Green finance has no longer been a far-fetched concept to global economies, with countries have signed the Paris Agreement which is a legally binding international treaty to tackle global environmental and climate issues (Dimitrov,2016; Blau, 2017). However, the concept has only been paid attention mainly by developed economies, which could be seen through the amount of green bond issued accounting for two-thirds of global green bond volume, and larger developing economies such as China,

who is the leading green bond issuing country (CBI, 2023). On the other hand, there had been only minor signs of participation of smaller size developing economies, yet in the near future these economies would have to face the consequences of climate and environmental externalities associated with economic growth. While there had been attempts to incorporate green finance into their financial markets, further research into this area has been proved necessary.

Over the last decades, Vietnam has enjoyed fast economic growth between 6%-9% GDP per year. The country has been able to make its mark on the global map without-of-expectation economic growth among other developing countries in Asia, scoring a phenomenal average growth rate of 6.9% during the 2000-2019 period and continued to show its resilience throughout the COVID-19 pandemic. The secret to such strong growth is no secret at all- by focusing on shifting away from an agriculture-reliant economy to upgrading industrial infrastructure and turning itself into a global value chain hub by focusing on green and resilient infrastructure and human resource development (World Bank, 2023). Therefore, the demand for energy undeniably skyrocketed, as the energy consumption would suggest economic growth and industrial-oriented economy (Nguyen et al., 2019). Given the country's growing reliance on fossil fuels (Figure 1) (IEA, 2023), the electricity sector accounts for approximately two-thirds of greenhouse gas emissions. A critical problem for Vietnam is to manage its rapid economic growth sustainably. As shown by its fast industrialization and urbanisation in the recent decades, Vietnam's structural transformation has significantly enhanced the country's standard of living while increasing its green economic recovery and susceptibility to climate change.

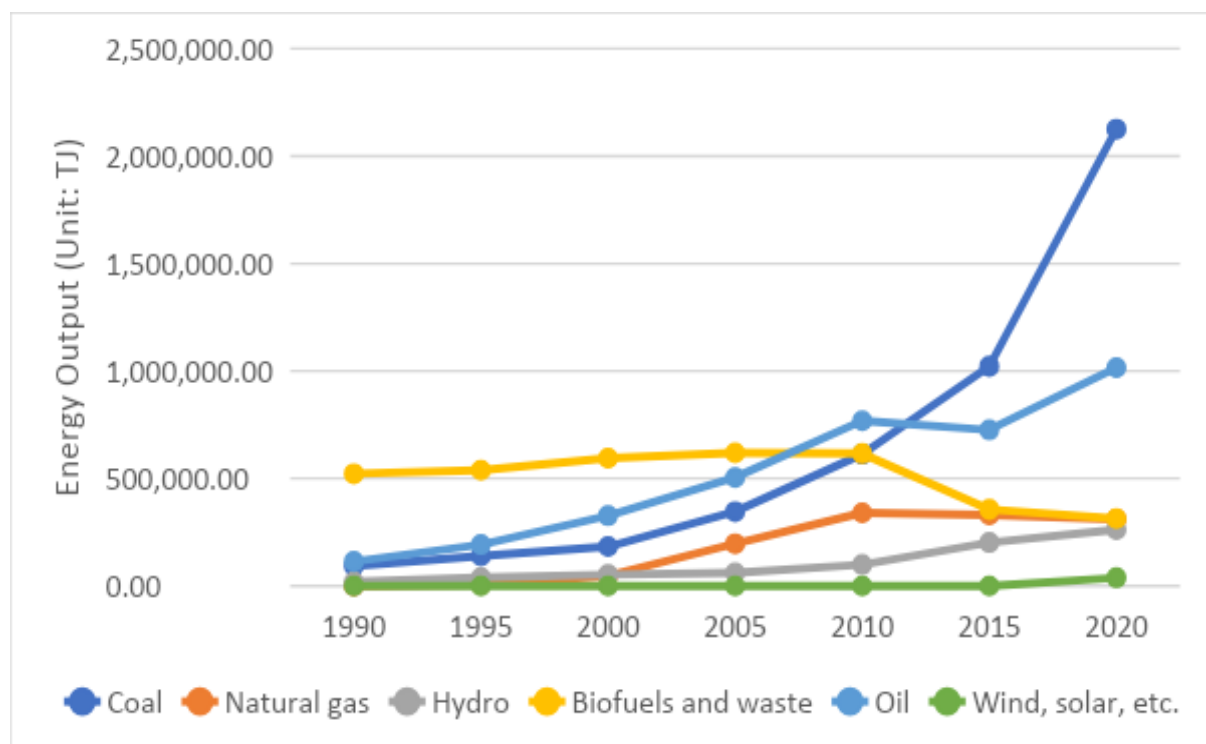


Figure 1: Vietnam Energy Output Composition
Source: IEA (2023)

The Vietnam government has initiated policies that mitigate the impact of climate change, transform the growth model towards green growth to tackle the limitation of such a carbon-intensive economic model. According to Zimmer et al. (2015), Vietnam first approved the National Climate Change Strategy (NCCS) in 2011 and Vietnam National Green Growth Strategy (VGGG) in 2012, which combined energy, economic growth and environment sustainability as the target for a low-carbon economy. Furthermore, the focus was then casted on renewable energy, with tax relief and supportive policies were revised and approved in the late 2010s, which further prove the determination of Vietnam in its low-carbon transition.

In order to realise such goal, it is necessary to have financial tools to facilitate the transitional process, especially in Asian countries where banks maintain to be major finance providers. To be specific, Vietnam's financial market is still immature, with a small market size and undiversified financial instrument range. The domestic stock market is small in scale and weak in structure, with a lack of diversity in market commodities. In addition, it has an immature bond market structure, in which the government bond segment holds the majority market share. Because of the small size of the capital market, financing for businesses is heavily reliant on bank credit capital (Banking Strategy Institute, 2015). Funding via Vietnam's banking system is also challenging due to the common view among domestic banks that renewable projects are risky and abnormal businesses that yields unattractive returns, as well as the common view of the public towards sustainability issues to be insignificant. Although, Vietnamese banks have been more interested in their green lending portfolio to date, the most significant obstacle that banks face is their inadequate capacity for processing green credit appraisals, including the risk assessment and evaluation of new technologies. The expectation for new and innovative financial vehicles, such as green bonds, is that they will provide an additional financial channel for renewable energy financing.

While most of literature in green finance had been dedicated to studying the financial instruments and the framework for development markets for the exchange of those instruments, little had been identified to investigate what motivates smaller firms and projects to use green finance as their funding sources. Therefore, this paper aims to investigate how firms in Vietnam decide how to raise funding for their investments, and more importantly, their motivation for the access of green finance compared to traditional finance. The aim of this paper could be translated into two objectives: (1) to identify the framework of intentions to access green finance access, and (2) to develop an analytical model of factors affecting the intentions to access green finance.

This study is survey-based. Specifically, the study uses the responses from 50 firms in Vietnam with varied business models and industry. The survey addressed three key areas: funding behaviours, motivation when finding sources of green finance motivation, and assessment of green financial instruments. The study is amongst the limited number of academic studies that use survey evidence based on a sample of firms in a mid – size developing economy, enabling to evaluate the research questions from a new perspective and to test the previous research findings in the literature. It

also offers more insights into firms financing processes and drivers of their decision-making which are not directly measurable based on archival market data. As such, the study contributes to the broader literature in finance with survey evidence to analyse policies and decisions of both firms and financial regulators.

2. Literature review and hypothesis development

In recent years, the complex relationship amongst sustainable development, firm's profit-making and value-maximizing goals has raised a phenomenal attention of research in financing decision making in green projects. Green finance - as the relationship now coined as - has emerged as the fundamental part in the green transition that offers an alternative financing pathway to individuals, corporations and governments willing to fund and invest in green activities or low carbon activities (Huang et al, 2019). The concept, while could be counter-intuitively believed to originate from developed economies, is pivotal to the sustainability of the emerging economies, especially those in the South East Asia region with rapid urbanisation and industrialisation. Research in recent years had been focused on the standardization of green finance definition (Lindenberg, 2014; Berrou et al, 2019), development of green finance market (Weber and ElAlfy, 2019), or the use of green finance by firms and investors (Sangiorgi and Schopohl, 2023; Gianfrate and Peri 2019). However, the financing decision-making process of firms seemed overlooked, with only the traditional financing behaviour having been long investigate across many regions that provided mixed results. Furthermore, the research is also of limited use since it used archival databases to measure the drivers of the use of financial sources. The paper contributes to the literature by expanding the topic of financing behaviour to the use of green finance via surveyed-preliminary data.

The model this paper aims to construct a model on the intention to adopt green finance based on the Planned Behavior Theory (PBT) developed by Ajzen (1991). The theory posited a model of motivation of certain actions that is constructed by three factors. The first mechanism of this model is the attitude towards an action. This mechanism represented how an individual perceives or view the benefits of an action, and the more benefits are realized the more willing they are to perform an action. Conversely, behaviors that are viewed as negative are less likely to occur. The second mechanism are the subjective norms, representing how the external factors affect one's view of a behavior. Subjective norms could be the standards that an individual considers to be a benchmark, or how others opinions affect their behavior. The third mechanism is called perceived behavioral control. This mechanism indicates how one assesses their own ability to perform an action, or it could be called self-efficacy. This self-perception could be formed through the skills of the manager, or the confidence in one's abilities, or real barriers that prevent one from doing something. These constructs of the model composite a person's intentions to perform, which would then be translated into actual behavior. While the intention could be seen to be distinct from actual behavior, and although intention does not explain all of the variance in actual behavior, it is a strong determinant of one's action. A diagram detailing the general operation of the theory of planned behavior (Ajzen, 1991) is displayed in Figure 2.

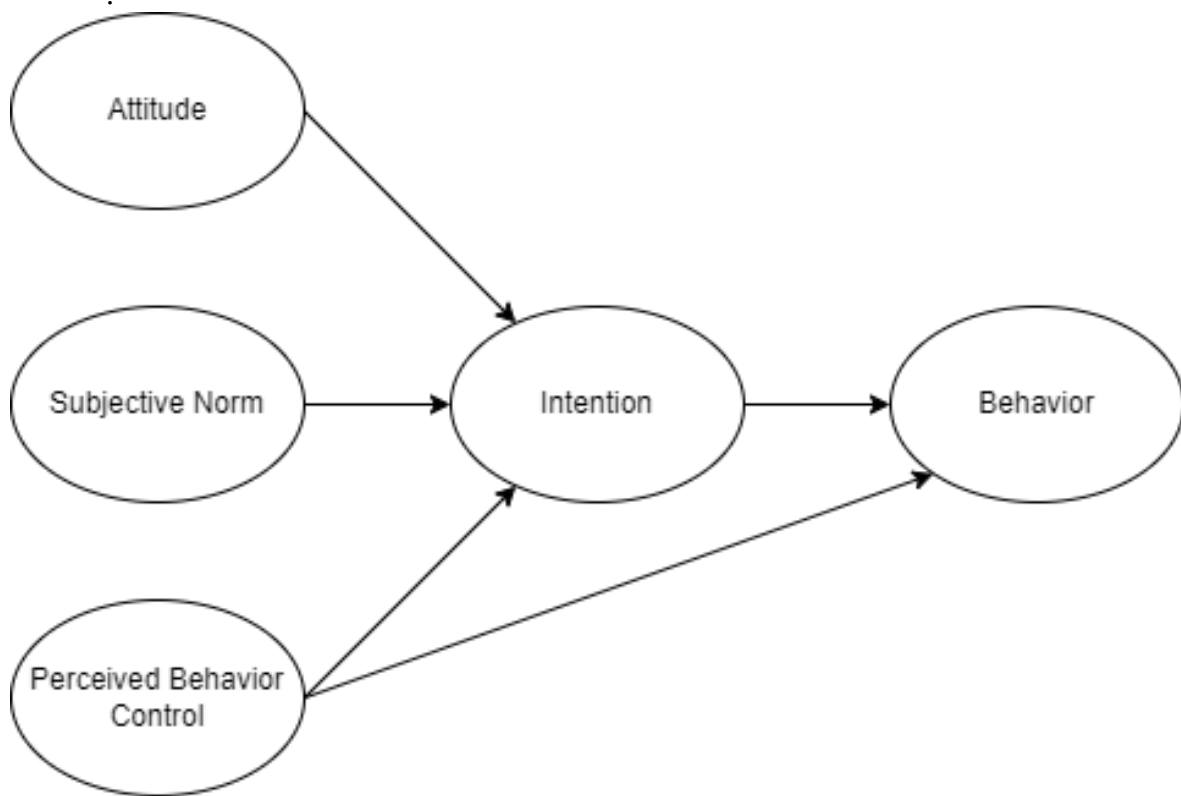


Figure 2: Pathway diagram of the Planned Behavior Theory

Because the PBT has been successfully applied in human behaviours and the decision-making process, it would be rational to apply the theory to the financing decision by firm managers. The TPB application in this paper examines the factors that influence managers' motivations to consider green finance as a source of capital. It includes (1) the manager's attitude toward the use of green finance, (2) the impacts of stakeholders on the managers' financing decisions, and (3) the ability of the managers to access green finance.

Attitude towards green finance

Regarding the choice of funding sources, traditional capital structure theories proposed two main ideas of how firms would decide its capital structure, or choose types of financial instruments for their fundraising strategy. According to the proposed theories, firms would either (1) decide on an optimal capital structure and use different type of funding instruments and sources to maintain such level (), or (2) have a pecking-order of finance instruments and classes, and would exhaust one option before moving to another (). Adhering to these theories, subsequent research was able to identify factors that would impact the choice of funding sources and strategy, with major work were carried out by Frank and Goyal (2009), which found that profitability, size of firms, tangibility, liquidity, past and future growth, uniqueness, non-debt tax shield, business risks, and agency costs. Furthermore, their research also found industry and country specific factors such as interest rate, inflation, or average industry indicators also impact the choice of funding sources. However, research were mostly conducted on public firms that could easily access

public debt and equity markets, whereas private firms had to rely on internal funds and direct bank loans to meet their financing needs (Goyal et al. 2011). In other words, availability of funding sources and access to different classes of capital could have certain impact on the choice of capital for firms (Faulkender and Peterson 2006). As public companies could enjoy wide range of financial instruments, private firms were found to be exclusively reliance on debt financing and have higher amount of cash stockpile, hence become more constrained in financing their investments and sensitive to their performance (Omer 2009; Le and Pham 2011). Therefore, it could be inferred that there are stronger ties between the performance of the firms and the decision of choice of capital sources for firms.

The same intuition could be applied to the choice of using green finance, as firms would be more likely to use the source if it could be translated to improvement in performance. Assessing listed firms and green bonds issuers in developed economies, Sangiorgi and Schopohl (2023) conducted one of the first survey-based research into the issuance of green bond and the motivation to do so, which accounted for a range of potential benefits for performance such as reputational benefits, lower cost of capital, and tax benefits. The same intuition could be applied to the choice of using green finance, as firms would be more likely to use the source if it could be translated to improvement in performance. Assessing listed firms and green bonds issuers in developed economies, Sangiorgi and Schopohl (2023) conducted one of the first survey-based research into the issuance of green bond and the motivation to do so, which accounted for a range of potential benefits for performance such as reputational benefits, lower cost of capital, and tax benefits.

The role of stakeholders in financing decisions

While the growing body of empirical literature uses firm characteristics as argument for financing decision, the role of both shareholders and non-financial stakeholders should not be ignored. Originally, a neoclassical view of stakeholders is coined as the claimants to the residual financial benefits of firms, which is to maximize wealth for the shareholders (Grinblatt and Titman 1998), which would usually affect dividend policies of firms. However, modern societies have required firms to evolve beyond such only purpose and to uphold the corporate social responsibilities, or to put emphasize on other non-financial stakeholders, as they too could have impact on the performance and decision of firms. Specifically, Grinblatt and Titman (1998) argued that the interaction between firms and their non-financial stakeholders is a determinant of the firm's capital structure, as those stakeholders would be less likely to do business with firms in distress. Therefore, how firms view each type of stakeholders should be further investigated in terms of their impacts on the financing decisions.

Prior research had been able to produce substantial findings, such as Brown et al.'s (2019) study on the role that institutional investors play in corporate capital structure decisions, McCahery et al. (2016) who investigate investors' governance preferences, Graham and Harvey (2001) exploring corporate finance practice. A few relevant studies in the field of corporate capital structure make use of questionnaires: Gompers

et al. (2016) study of private equity investors' practices in firm capital structure and governance, Brounen et al. (2004) work on cost of capital and corporate governance. In the sustainable finance and accounting literature, Amel-Zadeh and Serafeim (2018) employ a survey instrument to study how asset managers use ESG data in their investment decisions, Krueger et al. (2020) survey institutional investors' views on climate change risk, and the study by Hummel et al. (2021) investigates how environmental and social risks are integrated in the banking sector. However, how these stakeholders affect the use of green finance were not covered, therefore this paper would contribute to the study of the impacts of stakeholders on capital structure of firms, especially with the availability of green finance.

Hypothesis Development

From the above consideration three hypotheses are developed to find the answer to the research questions. Table 2.2 presents the hypotheses.

Table 1: Hypothesis structure

Hypothesis	Null hypothesis (H0)
H1	There is no association between the attitude of firm's managers and the willingness to use green finance.
H2a	There is no relationship between the impact of internal stakeholders and the overall stakeholder impacts on green finance adoption
H2b	There is no relationship between the impact of external stakeholders and the overall stakeholder impacts on green finance adoption
H3a	There is no relationship between the supports from stakeholders and the intention to adopt green finance
H3b	There is no relationship between the availability of financing sources and the intention to adopt green finance

3. Methods

Survey design

Drawing on the recent survey-based research by Sangiorgi and Schopohl (2023) on the green finance issuance in European countries, the data was collected through questionnaire survey. Financial managers, chief accountants, and other financial decision-makers were selected as respondents under the assumption that they had basic knowledge of green finance. The constructs of the TPB were measured by multiple indicators via five-point Likert scales in the questionnaire development. These indicators were used because psychological constructs and indicators could not be reliably captured by a single rating scale. All the scales employed in the survey were originally developed for the study.

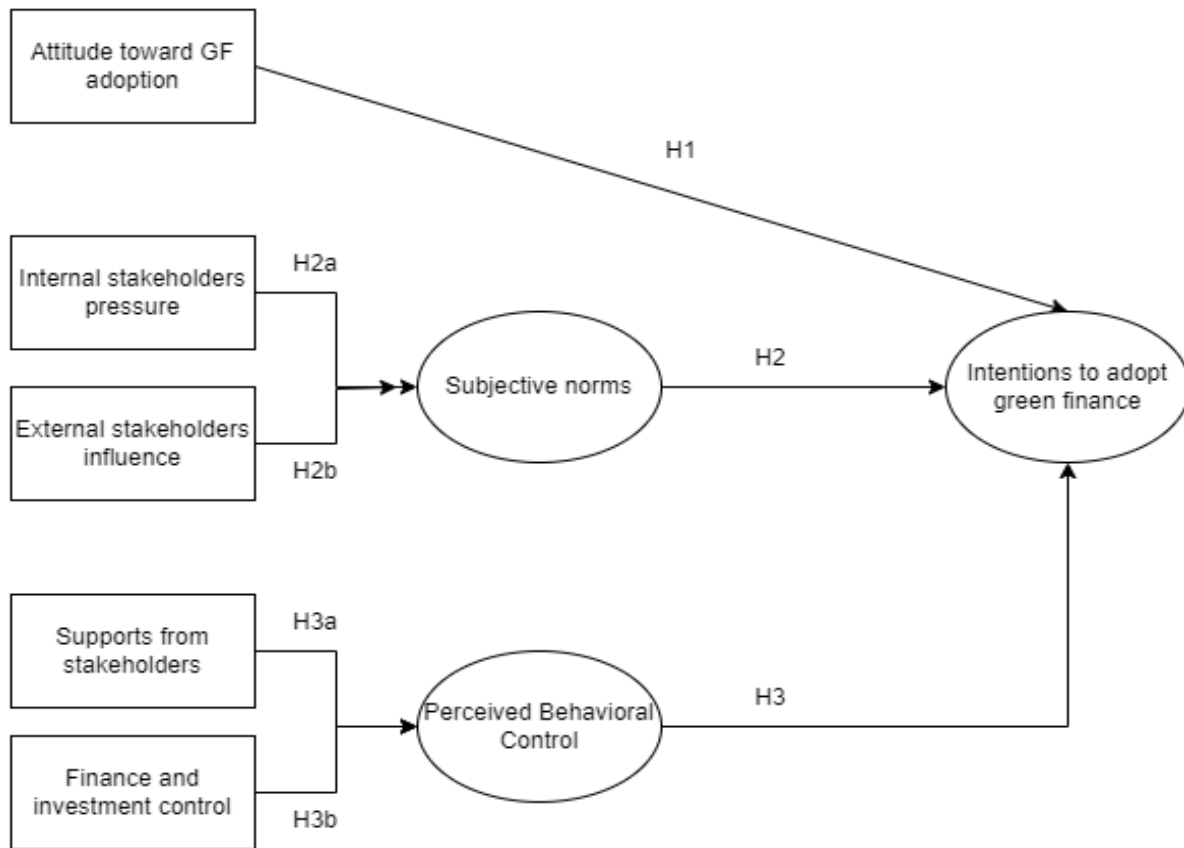


Figure 3: Research framework of motivation for green finance

The attitude towards green finance was measured by four items capturing (1) manager’s beliefs regarding the value of using green finance to the company, (2) managers’ perceptions of the benefits experienced by the company from using green finance – and (3) the overall evaluation. Next, subjective norm was measured by four items capturing how others view a certain action – in this case how stakeholders view green finance adoption. Subjective norm items with injunctive quality typically have low variability because important others typically approve the desirable behavior and disapprove the undesirable behavior. To overcome this problem descriptive quality items were included in the scale (Ajzen, 2006). And finally, the measure the behavioral control of the managers, or the perceived behavioral control items relevant to using green finance were selected from the literature (Sangiorgi & Schopohl, 2023). They represent items of self-efficacy (capability of performing the behavior) and controllability over the behavior. The questionnaires were developed to collect the data from respondents (Appendix 1).

Data collection administration

The data collection was conducted from July-September 2023 in both Northern and Southern areas of Vietnam. After screening data was performed using the down-sampling process from the General Statistics Office of Vietnam, the survey questionnaires were sent to 300 companies. After three pilot tests with small sample respondents, the surveys were carried out by questionnaire form distribution to a random database of firms at provincial clusters provided by the General Statistics

Office of Vietnam and managed to collect 50 responses, showing a response rate of around 17%. The respondents were high-level managers of the firms who are in decision-making position and have knowledge and experience in capital source decision making. The official survey was carried out and the responses were then collected through pre-structure questionnaires, which included 30 questions covering (1) the characteristics of the firms, (2) the financing behaviour and strategy of the managers/experts, and (3) their perceptions on green finance as a source of finance compared to traditional finance. The data collection was conducted over a three-month period between July and September 2023, which were then translated, standardised, coded into SPSS software (Version 29.0) and compared to the original entry to eliminate errors.

Sample characteristics

Table 3.1 provides an overview of the 50 respondents by the operation regions of the business (Panel A), their legal status (Panel B), industry their main business in (Panel C). Most of the respondents were most companies from private sector (74%) and foreign direct investment firms (26%). Most of the respondents were in the industrial and production industries (66%), while the energy sector only consisted of 12%. This is due to Vietnam energy being supplied by major state-owned companies, yet certain private investments into the energy sector were able to be included in the research.

Table 2: Respondent characteristics

Panel A: Region	Count	Relative (%)
North	28	56
South	22	44
Panel B: Legal status of firms	Count	Relative (%)
FDI	13	26
Private Company	37	74
Panel C: Industry	Count	Relative (%)
Energy	6	12
Multi-Industry	7	14
Industrial/Production	33	66
Construction	4	8

Data analysis and the model components

Attitude of Firm's Managers and the Willingness to Use Green Finance

The first construct examining the attitude of firm's managers and their willingness to adopt green finance provides a nuanced understanding of the internal factors driving the adoption of green financial practices. This construct's composite reliability is 0.812, suggesting a moderate level of internal consistency. Although this value is slightly below the commonly accepted threshold of 0.7, it is still within an acceptable range for exploratory research. The Average Variance Extracted (AVE) of 0.61 indicates that the construct explains a significant proportion of variance, confirming its convergent validity.

Using factor analysis using Varimax rotation technique, four loadings were yielded for these four indicators in explaining the attitude factor. These indicators within this construct reveal important insights into managerial attitudes. The first indicator with highest loading, "Adopting green finance is beneficial for company's reputation", explains how important the managers consider how green finance would improve the company's image. The result showed a highest loading of 0.778. The next indicator, "Adopting green finance will create low financing cost," has a factor loading of 0.739. This substantial loading indicates that the perception of reduced financing costs is a significant motivator for managers. Lower financing costs can be a strong incentive as they directly impact the firm's profitability, making green finance an attractive option.

The next loading in this construct, "Adopting green finance will help diversify finance sources," has a loading of 0.686, suggesting that diversifying the source of finance is considered to be more notable beneficial feature of green finance. Diversifying finance sources can mitigate risk and enhance financial stability, making firms less vulnerable to market fluctuations and economic downturns, while expanding their offerings to more investors. The high loading on this indicator implies that the ability to tap into new and potentially more stable sources of finance is a compelling reason for managers to consider green finance.

The final indicator, "Adopting green finance will help the company achieve environmental sustainability," has a factor loading of 0.670, demonstrating that environmental sustainability is also a significant consideration for managers. As the corporate social responsibility and sustainability are increasingly important, the ability to contribute positively to the environment can enhance a company's reputation and fulfill ethical obligations, so this indicator would indicate that attitude of the managers towards the environmental-friendliness of green finance. Such high loading on this indicator indicates that managers recognize the strategic importance of sustainability in securing long-term success and legitimacy. With this high factor loadings of the indicators that showed good reliability and acceptable internal consistency of the response, these four factors are suitable indicators for the Attitude construct of the model.

Impacts of Stakeholders on Using Green Finance

The second construct focuses on learning about the impact of the stakeholders on the intention to adopt green finance. From the factor analysis of the factors, two components were discovered that were then named as Internal Stakeholders (consisted of the ratings for employees, current shareholders, and customers) and External Stakeholders (consisted of ratings for peer company, prospect investors, and the government regulatory bodies) (Table 4). The internal stakeholders' influence on green finance adoption is measured by a reliability level of 0.781 and an Average Variance Extracted (AVE) of 0.554. These metrics indicate a moderate level of internal consistency and convergent validity, suggesting that the construct is reliable and valid for this exploratory research.

The first indicator of the construct, "Employees have impact on green finance adoption," has a factor loading of 0.918. This high loading suggests that employees are a decisive driving force in the adoption of green finance. Employees' advocacy for sustainable practices can create substantial internal pressure for firms to adopt green finance. This finding underscores the importance of fostering a corporate culture that values sustainability and the role of employees in promoting green finance initiatives. The second indicator, "Current shareholders have impacts on green finance adoption," has a factor loading of 0.562. While being the lowest amongst of others, it still indicates that current shareholders influence still have a crucial role green finance adoption, decision, although not as significantly considered as others. The result could be due to varying levels of awareness or prioritization of green finance among shareholders, or differing expectations regarding financial returns and sustainability that managers must consider. Finally, the "Customers have impacts on green finance adoption," has a factor loading of 0.709, suggesting that customer expectations and demands for sustainability play a significant role in driving firms to consider green finance from the organizational strategic decision making perspective. As consumers become more environmentally conscious, their preferences can influence corporate strategies, encouraging firms to adopt sustainable financial practices to meet customer expectations and enhance market competitiveness.

On the other hand, the External Stakeholders' influence on green finance adoption is measured by a composite reliability of 0.753 and an AVE of 0.507, which also showed acceptable internal consistency of the constructs and convergence validity. From the factor analysis, "Peers company have impact on green finance adoption," has a factor loading of 0.714. This loading indicates that competitive pressures and industry norms significantly influence green finance adoption, as firms often look to their peers for best practices and benchmarks, suggesting that industry standards and the actions of peer companies have powerful motivation for green finance adoption. The second indicator, "Government regulatory bodies have impact on green finance adoption," which tried to measure how government and regulatory bodies has a high factor loading of 0.801. This suggests that regulatory frameworks and government policies are critical drivers of green finance adoption, showing that the government has the highest impact on the manager's intention to adopt green finance. Furthermore, regulatory requirements and incentives create a favorable environment for green finance, making compliance and strategic alignment essential for firms. This finding highlights the role of government intervention in promoting sustainable financial practices. The final indicator of this construct indicator, "Prospective investors have impact on green finance adoption," has a factor loading of 0.607. This moderate loading indicates that the interest of potential investors in sustainable practices. As the investment community increasingly prioritizes environmental, social, and governance (ESG) criteria, firms may adopt green finance to attract and diversify investor interest, highlighting the growing importance of prospective investor expectations in corporate financial strategies.

Perceived behavioral control

The final component of the model, the perceived behavioral control, aims to explain the assessment of the manager's own ability to use green finance. The factor analysis also showed a split in the responses into two major patterns: the "Supports from Stakeholders", which measured how managers evaluate the current willingness of different stakeholders on possibility of green finance adoption. On the other hand, the responses also suggest a pattern for assessment for potential green finance sources, hence the name "Finance and Investment Control".

Firstly, the construct of "Supports from Stakeholders" within the context of green finance adoption in Vietnam exhibits high internal consistency and convergent validity, as indicated by a Composite Reliability of 0.910 and an Average Variance Extracted (AVE) of 0.774. The "My company has suitable projects for green finance" exhibits the highest loading at 0.937. This high loading suggests that the availability of suitable projects is a critical determinant for managers seeking to access green finance. The presence of appropriate projects implies that firms saw themselves to have tangible and feasible initiatives that can attract green finance, thus making it easier for managers to justify and secure such funding. This suggests that firms currently have suitable investments and projects that are suitable for green finance, thus show the importance of project readiness and alignment with green finance criteria, which are essential for successful adoption.

Similarly, the item "There are enough demands from shareholders for green finance instruments" has a high loading of 0.933, indicating current shareholders of the firms also show supports for using other financing sources that promotes sustainability. As shareholders' interest and demand for green finance instruments signal a supportive internal environment, firms when recognizing their demands would be more willing to adopt green finance. This high loading shows shareholders' preferences can significantly influence the firm's strategic direction towards sustainability and green finance, thus indicating the influence to be a good representative of managers' self-assessment of the support from their shareholders.

The final item of this construct, "The green finance market in Vietnam is well-developed", has a lower loading of 0.756 compared to the other item. This suggests that while the development and maturity of the green finance market in Vietnam are important, they are relatively less critical compared to the availability of suitable projects and shareholder demand. As well-developed financial market acts as a conduit for green finance by offering better access to financial instruments, regulatory support, and market infrastructure. However, while Vietnamese financial markets are absent of a fully mature market and a inherited bank-dominated economy, firms with strong internal projects and shareholder support can still effectively engage in green finance activities.

The construct of "Finance and Investment Control" within the context of green finance adoption in Vietnam demonstrates substantial internal consistency and convergent validity, as indicated by a Composite Reliability of 0.840 and an AVE of 0.648. The

item "There are demands from prospect investors" has the highest loading at 0.922, which indicates that the demand from prospective investors is a critical determinant of effective finance and investment control in green finance adoption. Firms when calling for finance and fundings from external sources, they would perceive strong interest from potential investors as essential for the successful issuance and management of green finance instruments. Therefore, the significant demand from prospective investors can enhance a firm's confidence in launching green finance initiatives, ensuring that there would be willing investors to buy their green finance instruments, thus underscores the importance of investor interest and market demand in driving green finance adoption.

Finally, the item "The company has enough capacity to issue green finance instruments" follows closely with a loading of 0.905. This suggests that self assessment of internal capability also have strong representative power of managers' perception on their own ability to access green finance. To be specific, these capabilities include the necessary financial infrastructure, expertise, and resources required to issue green finance instruments effectively. Therefore, firms with robust internal capacity are better positioned to navigate the green finance landscape, leveraging their strengths to manage and control green finance activities successfully. Thus, such high loading reflects that internal readiness, in terms of capacity and capability, is crucial for firms to engage in green finance initiatives, hence being a good indicator of the managers' self-efficacy.

In contrast, the item "The green finance market in Vietnam is well-developed" has a lower loading of 0.523. While the maturity and development of the green finance market are important, they are less critical compared to investor demand and internal capacity. This lower loading suggests that even in a less mature market, firms with strong internal capabilities and high investor interest can still manage green finance activities effectively. The development of the green finance market provides a supportive environment, offering better access to financial instruments, regulatory support, and market infrastructure. However, the primary drivers for effective finance and investment control are the demand from prospective investors and the firm's capacity to issue green finance instruments.

Table 3: Composite Reliability, AVE scores and loadings

Constructs and indicators	Item loading
The attitude of firm's managers and the willingness to use green finance - Attitude towards green finance adoption (Composite Reliability = .812, AVE = .592)	
Adopting green finance is beneficial for company's reputation	.778
Adopting green finance will create low financing cost	.739
Adopting finance will help diversify finance source	.686
Adopting GF will help company achieve environmental sustainability	.670
The impacts of stakeholders on using green finance - Subjective Norms	
Internal stakeholders influence on green finance adoption (Composite Reliability = .781, AVE = .554)	
Employees have impact on green finance adoption	.918
Current shareholders have impacts on green finance adoption	.562
Customers have impacts on green finance adoption	.709
External stakeholders influence on green finance adoption (Composite Reliability = .753, AVE = .507)	
Peers company have impact on green finance adoption	.714
Government regulatory bodies investors have impact on green finance adoption	.801
Prospect investors have impact on green finance adoption	.607
The ability of the managers to access green finance - Perceived Behavioral Control	
Supports from Stakeholders (Composite Reliability = .910, AVE = .774)	
My company has suitable projects for green finance	.937
There are enough demands from shareholders for green finance instruments	.933
The green finance market in Vietnam is well-developed	.756
Finance and Investment Control (Composite Reliability = .840, AVE = .648)	
There are demands from prospect investors	.922
The company has enough capacity to issue green finance instruments	.905
The green finance market in Vietnam is well-developed	.523

4. Results

Binary Logistic Regression Result

The dependent variable in this logistic regression model is the intention to use green finance (INT), a binary variable indicating whether a firm intends to adopt green finance practices. The independent variables include: (1) Attitude towards benefits of Green Finance, representing the attitude towards the benefits of green finance; (2) Internal Stakeholders and External Stakeholders, two first-order latent variables of the higher-order latent variable Subjective Norms; and (3) Supports from Stakeholders and Availability of Finance sources, two first-order latent variables of the higher-order latent variable Perceived Behavioral Control. The logistic regression results are presented in Table 5.1. The analysis reveals that several predictors significantly influence the intention to adopt green finance.

Table 4: Logistic Regression Table

	B	Bootstrap^a		Sig. (2-tailed)	95% Confidence Interval	
		Bias	Std. Error		Lower	Upper
Attitudes Towards Green Finance Benefits	1.003	.519 ^b	163.684 ^b	.353 ^b	-170.619 ^b	164.360 ^b
Internal Stakeholders	1.043	53.565 ^b	440.810 ^b	.075 ^b	-.451 ^b	387.628 ^b
External Stakeholders	-1.114	-24.514 ^b	124.658 ^b	.069 ^b	-161.412 ^b	.841 ^b
Supports from Stakeholders	.645	11.277 ^b	50.744 ^b	.272 ^b	-25.777 ^b	100.450 ^b
Availability of Finance sources	-.223	-24.288 ^b	274.747 ^b	.575 ^b	-88.662 ^b	8.822 ^b
Constant	-3.088	-85.994 ^b	567.717 ^b	.001 ^b	-610.546 ^b	-2.227 ^b

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

b. Based on 996 samples

The first predictor, or independent variables, Attitudes Towards Green Finance Benefits, has a positive coefficient ($B = 1.003$), indicating a positive relationship with green finance adoption. However, the high standard error (163.684) and wide confidence interval ($[-170.619, 164.360]$) suggest significant variability and uncertainty in this estimate. Furthermore, the significance value ($p = 0.353$) indicates that this variable is not statistically significant. Despite the positive direction, the lack of statistical significance and high variability imply that attitudes towards green finance benefits do not have a strong, reliable impact on green finance adoption in this model. Internal Stakeholders also show a positive influence on green finance adoption with a coefficient of 1.043. The standard error is substantial (440.810), and the confidence interval is wide ($[-.451, 387.628]$), reflecting considerable uncertainty. The significance value ($p = 0.075$) suggests marginal significance at the 10% level, but not at the conventional 5% level. This indicates that while internal stakeholders might have a positive effect, the evidence is not robust enough to conclusively determine their impact. Employees, current shareholders, and customers within the organization potentially drive the adoption of green finance, but further research with a larger sample size may be needed to confirm these findings.

External Stakeholders have a negative coefficient (-1.114), implying a deterring effect on green finance adoption. The standard error (124.658) and confidence interval ($[-161.412, .841]$) indicate substantial variability. The significance value ($p = 0.069$) suggests marginal significance at the 10% level. This negative relationship, though not conclusively significant, hints at potential challenges or pressures from external entities such as peers, regulatory bodies, and prospective investors that might hinder the adoption of green finance. These findings highlight the complex dynamics between external influences and corporate sustainability strategies.

Supports from Stakeholders exhibits a positive coefficient (0.645), suggesting a supportive role in green finance adoption. The standard error (50.744) and confidence interval ([-25.777, 100.450]) suggest moderate variability. The significance value ($p = 0.272$) indicates that this variable is not statistically significant. While the positive coefficient implies that support from stakeholders could encourage green finance adoption, the lack of statistical significance reduces confidence in this finding. It underscores the need for stronger and more consistent stakeholder support to effectively drive green finance initiatives.

The Availability of Finance Sources presents a negative coefficient (-0.223), indicating a potential negative impact on green finance adoption. The high standard error (274.747) and wide confidence interval ([-88.662, 8.822]) reflect substantial uncertainty. The significance value ($p = 0.575$) shows that this variable is not statistically significant, yet with this negative coefficient, combined with high variability and lack of significance, suggests that the availability of finance sources does not have a reliable impact on green finance adoption in this model. This could imply that merely having access to financial resources is insufficient without other supportive factors, as those financing sources may prove ineffective or insufficient from the perspectives of issuers. Finally, the constant term has a negative coefficient (-3.088), which is statistically significant ($p = 0.001$). This indicates that there are other underlying factors not included in the model that significantly influence green finance adoption. The high standard error (567.717) and wide confidence interval ([-610.546, -2.227]) reflect significant variability, showing that the baseline level of green finance adoption is influenced by additional variables not captured in this analysis.

Table 5: Hypothesis testing results

Hypothesis	Null Hypothesis (H0)	Accepted/Rejected
H1	There is no association between the attitude of firm's managers and the willingness to use green finance.	Accepted
H2a	There is no relationship between the impact of internal stakeholders and the overall stakeholder impacts on green finance adoption.	Rejected
H2b	There is no relationship between the impact of external stakeholders and the overall stakeholder impacts on green finance adoption.	Rejected
H3a	There is no relationship between the supports from stakeholders and the intention to adopt green finance.	Accepted
H3b	There is no relationship between the availability of financing sources and the intention to adopt green finance.	Accepted

Note: Hypotheses are accepted/rejected at 10% level due to the exploratory nature of this research

Table 6: Hosmer and Lemeshow Test

Chi-square	df	Sig.
3.784	8	0.876

The goodness of fit for the logistic regression model was evaluated using the Hosmer and Lemeshow test, yielding a Chi-square value of 3.784 with 8 degrees of freedom and a significance level of 0.876. The low Chi-Square indicates minor differences between the observed and predicted values, suggesting that the model's prediction are closely aligned with actual outcomes.. Furthermore, the high p-value of 0.876, significantly exceeding the conventional alpha level of 0.05, indicates no statistically significant difference between the observed and predicted probabilities. This implies that the model does not deviate significantly from a perfect fit, thereby confirming the model's robustness. Consequently, the test results suggest that the logistic regression model offers a reliable fit to the data. The model's accurate prediction of the outcomes supports the validity of our conclusions regarding the significant roles of attitudes towards green finance benefits, internal and external stakeholders, and stakeholder support in influencing green finance adoption.

Further analysis of the model

This exploratory model provides an insights into the factors influencing the intention to adopt green finance among private firms in Vietnam, which aims to highlight the need for increasing awareness and education about the advantages of green finance. The model, using data from 50 firms in Vietnam, shows that the role of internal stakeholders is another critical area highlighted by this study. The positive influence of internal stakeholders suggests that empowering employees and management with knowledge and tools to advocate for green finance can significantly boost adoption rates.

On the other hand, the negative impact of external stakeholders on the intention to adopt green finance presents a more complex challenge. This finding indicates that external pressures, such as regulatory requirements or market conditions, may currently act as barriers rather than enablers for green finance adoption, especially in an immature and bank-dominated financial market in emerging economies like Vietnam. Therefore, policymakers and regulators in Vietnam need to address these barriers by creating a more supportive and coherent regulatory framework that encourages rather than deters green finance adoption. Incentives, such as tax breaks, subsidies, and grants for firms that adopt green finance practices, can help offset perceived risks and costs associated with these external pressures. Additionally, fostering a collaborative environment where external stakeholders, including regulators, financial institutions, and industry bodies, work together to promote green finance can create a more favorable external context for firms.

While supports from stakeholders and the availability of finance sources did not emerge as significant predictors in this study, these factors should not be disregarded entirely. The non-significance of these variables suggests that merely having access to finance or stakeholder support is not enough to drive adoption. Instead, a more

integrated approach that combines financial support with education, regulatory incentives, and internal stakeholder empowerment is needed. Future research should explore additional variables that might influence green finance adoption, such as firm size, industry sector, and the presence of existing sustainability initiatives.

5. Conclusions

This study, by applying the Planned Behaviour Theory, provides an in-depth analysis of the factors influencing the adoption of green finance among private firms in Vietnam. Using data collected from 50 firms in Vietnam via preconstructed survey, the logistic regression analysis identified several key variables that have significantly impact firms' intentions to adopt green finance practices. Notably, the attitude towards the benefits of green finance emerged as a significant positive predictor, indicating that firms with a favorable perception of green finance are more likely to adopt these practices. This signals the importance of educational and awareness programs that highlight the economic and environmental benefits of green finance, especially in an Asian country where green projects are viewed to yield low return with high risks. Similarly, the influence of internal stakeholders, such as employees and management, was found to significantly increase the likelihood of green finance adoption. Furthermore, empowering internal stakeholders by providing them with the necessary knowledge and tools can enhance their ability to support and advocate for green finance initiatives. Therefore, policymakers and regulators need to address external barriers by creating a conducive regulatory environment that supports green finance adoption foster a more conducive environment for green finance adoption, ultimately contributing to sustainable economic development. In other words, empowering these stakeholders can enhance their role in advocating for and implementing green finance initiatives within firms.

Conversely, the model also revealed that external stakeholders have a significant negative impact on the intention to adopt green finance, suggesting that external pressures, such as regulatory requirements or market conditions, may currently act as barriers. Once again, this result reflects the current lack of regulations on green finance initiatives and green projects promotion, as well as the immaturity of Vietnamese financial market that is dominated by banks as main finance providers. This finding indicates a need for policymakers and regulators in Vietnam to create a more supportive regulatory framework that encourages green finance practices.

Finally, future research should explore additional variables, such as firm size, industry sector, and the presence of existing sustainability initiatives, to gain a more comprehensive understanding of green finance adoption. By adopting a comprehensive approach that includes education, regulatory support, and internal stakeholder empowerment, Vietnam can encourage private firms, who usually faces lack of financial sources diversity, to use green finance for their sustainability projects and goals.

6. References

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Appendix 1 The survey questionnaire

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Scale	1	2	3	4	5
The attitude of firm's managers and the willingness to use green finance - Attitude towards green finance adoption (1 for Strongly Disagree, to 5 for Strongly agree)					
Adopting green finance is beneficial for company's reputation					
Adopting green finance will create low financing cost					
Adopting finance will help diversify finance source					
Adopting GF will help company achieve environmental sustainability					
The impacts of stakeholders on using green finance - Subjective Norms (1 for Strongly Disagree, to 5 for Strongly agree)					
Internal stakeholders influence on green finance adoption					
Employees have impact on green finance adoption					
Current shareholders have impacts on green finance adoption					
Customers have impacts on green finance adoption					
External stakeholders influence on green finance adoption					
Peers company have impact on green finance adoption					
Government regulatory bodies investors have impact on green finance adoption					
Prospect investors have impact on					

green finance adoption					
The ability of the managers to access green finance - Perceived Behavioral Control (1 for Strongly Disagree, to 5 for Strongly agree)					
Supports from Stakeholders					
My company has suitable projects for green finance					
There are enough demands from shareholders for green finance instruments					
The green finance market in Vietnam is well-developed					
Finance and Investment Control					
There are demands from prospect investors					
The company has enough capacity to issue green finance instruments					
The green finance market in Vietnam is well-developed					