

## Challenges in green accounting: Sustainable development for companies listed on the Vietnam stock exchange



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### ABSTRACT

This research investigates the influence of various determinants on the adoption of green accounting (GA) practices and examines how these practices affect the performance of 283 enterprises listed on the Vietnam Stock Exchange. Despite mandatory environmental regulations set by the government, a limited number of businesses integrate GA into their sustainable development strategies. Employing a mixed-methods approach, this study combines qualitative and quantitative research methodologies, utilizing a multivariable linear regression model for the analysis of primary data through SPSS and AMOS software. The findings reveal that factors such as the potential for business expansion, state regulatory bodies, and corporate attributes positively influence the implementation of GA. Additionally, the research demonstrates the beneficial impact of GA on the operational efficiency of enterprises. Drawing from these findings, the study proposes strategic recommendations and solutions for listed companies and relevant stakeholders in Vietnam. These strategies aim to enhance corporate prestige and positioning, thereby contributing to the sustainable development of the national economy.

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### 1. Introduction

Based on the Prime Minister's national strategy for green growth, Vietnam's Ministry of Planning and Investment is guiding the country towards a sustainable development strategy via a green economy. This approach, as highlighted by [ElAlfy et al. \(2020\)](#), aligns with the long-term objectives of businesses, forming part of their strategic vision. A key aspect of sustainable business is the balance of economic, social, and environmental factors. Business operations are expected to maintain this balance, ensuring economic benefits while addressing social risks and environmental safety.

There is an increasing emphasis on sustainable development among corporate stakeholders, including investors and consumers. This focus encompasses economic, environmental, and social sustainability. Modern corporate sustainable development is seen as a new management model. It promotes business growth and profitability while

also integrating and addressing social goals, especially those related to environmental protection.

[Ulupui et al. \(2020\)](#) discussed green accounting (GA), a subset of environmental accounting. It details a company's efforts to integrate environmental and cost benefits into its decision-making processes or as a financial outcome of its operations. The primary aim of GA is to assist businesses in understanding and managing the connection between traditional economic objectives and environmental goals, leading towards sustainable development. As [Bartelmus \(2013\)](#) noted, GA, which encompasses both environmental and economic accounting, is prevalent at national and corporate levels. It represents a method and direction for transformation towards a "green economy" and aligns with the global economic system's overall development trends.

In Vietnam, a number of businesses have recently been observed to generate waste that detracts from the economy's "green" nature. Consequently, it is important for these businesses to implement an accounting system that includes environmental factors. Over the past few decades, both the business world and society have increasingly acknowledged the importance of environmental factors. These factors are now seen as crucial in shaping economic development and business decision-making, as noted by [Brooks and Schopohl \(2020\)](#). [Dhar et al.](#)

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(2022) described GA as the evaluation of environmental costs and resource depletion within a country. GA was developed to help businesses balance environmental objectives with traditional economic goals, facilitating a better understanding and management of these trade-offs.

Currently, businesses, particularly those listed on the Vietnamese stock market, are subject to stringent state regulation. Achieving listed status is often seen as a pinnacle of business development. This status imposes specific responsibilities and obligations on issuers for transparent, honest, and fair information disclosure. Vietnam's economic strategy emphasizes rapid and sustainable development, aiming to balance economic, environmental, and social issues while protecting the environment. The State has implemented legal measures to curb the overuse of natural resources and minimize environmental damage and pollution.

In the future, enterprises will need to focus on disclosing environmental activities and costs, particularly in their annual reports. These disclosures provide a comprehensive view for users of financial statements. According to [Miroshnychenko et al. \(2017\)](#), a company's financial position is greatly influenced by its environmental performance. [Bansal \(2005\)](#) and [Fakir and Jusoh \(2020\)](#) suggested that GA is a key contributor to a company's performance. Moreover, the sustainable development of enterprises is of paramount importance, with GA playing a significant role in this process.

[Banerjee \(2001\)](#) highlighted the necessity of environmental accounting at the corporate level. This can be implemented through the disclosure of environmental performance. A key element in GA is the inclusion of environmental costs in financial reports, particularly in sustainability reports, as noted by [Pratiwi and Hidayah \(2023\)](#). However, the adoption of GA in Vietnam faces challenges. Many companies on the Vietnamese stock market are reluctant to implement this model. GA, an evolved form of traditional accounting that incorporates environmental and social factors, is validated by global studies. This reluctance in Vietnam may be due to various reasons, leading to hesitancy among businesses to embrace GA practices.

Given these challenges, research into the factors influencing GA and its impact on the performance of Vietnamese stock market-listed companies is pertinent. This study is motivated by the limited research in Vietnam on how GA affects enterprise performance. Thus, this research aims to contribute to the literature on GA within Vietnam's economic context.

## 2. Review of literature

### 2.1. Factors affecting GA and the application of GA

As the global trend towards green growth and a green economy gains momentum, GA is becoming

increasingly prevalent in many countries. This field has also emerged as a significant area of research for scholars worldwide. The push for sustainable development and the need to reduce and minimize environmental impacts has made GA an important focus for policymakers, business leaders, and researchers.

[Maama and Appiah \(2019\)](#) combined qualitative and quantitative research methods to survey the voluntary use of GA in some listed companies in Ghana. The study concluded that the level of a company's impact on the environment is directly proportional to the level of GA adoption. However, the information is not clearly defined, and qualitative research methods are mainly used. From there, the research proposes to organizations to consider and encourage businesses to apply the form of GA.

[Rahman and Rahman \(2020\)](#) observed that in Bangladesh, there is a widespread recognition of GA's importance for sustainable development, and they emphasize the necessity for its implementation in businesses. Their conclusion is based on a survey conducted with 120 professionals and students, highlighting GA's role in resource utilization and environmental sustainability. [Khiem and Cong \(2021\)](#), using quantitative research methods and multivariable linear regression models, analyzed data from manufacturing enterprises in Thai Nguyen province. Their study identified factors influencing the adoption of GA, including business expansion potential, people's perceptions within the business, and stakeholder incentives. However, they note limitations in their research regarding the scope and range of influencing factors, as well as the simplicity of the data analysis approach.

In a qualitative study conducted in Bali province, [Adyatma et al. \(2022\)](#) revealed that small and medium enterprises (SMEs) in Bali have limited understanding and application of GA in their business practices. Typically, these SMEs still handle waste in a traditional manner, which is less professional compared to larger enterprises. The study suggests that raising awareness about environmental protection in SMEs could begin with the implementation of GA. The hope is that GA in SMEs will positively impact society, not only economically but also in terms of natural, social, and cultural aspects.

Additionally, [Van's \(2022\)](#) research provided insights for businesses on moving towards sustainable development by delineating the relationship between traditional economic and environmental economic goals. Based on a 2021 survey of 252 Vietnamese enterprises, the study identifies two main groups of factors influencing the adoption of GA in businesses. These include factors related to state management agencies (such as regulations, guidelines, reward and penalty systems) and factors internal to the enterprise (like corporate culture and industry specifics).

[Dinh et al. \(2020\)](#) combined qualitative and quantitative research methods to identify six factors influencing environmental accounting in

manufacturing enterprises. These factors are firm size, stakeholder pressure, perceived benefits of implementation, legal regulations, financial resources, and staff qualifications. Their multivariate regression analysis indicated that all these factors positively impact the adoption of environmental accounting in Vietnam's manufacturing sector. However, the study has limitations, including the diverse nature of the surveyed enterprises, which may not accurately represent each business type. Additionally, the study did not consider other potentially influential factors like environmental strategy, business lines, and audit practices. Another limitation is the reliance on long-published studies and a small sample size, which might affect the generalizability and quality of the research findings.

In a separate study, [Nguyen et al. \(2023\)](#) focused on the impact of various factors on the application of GA in Vietnam's construction enterprises. They collected data from 243 questionnaires filled out by managers and accountants. The research utilized Cronbach's alpha test, exploratory factor analysis, and multiple regression analysis, revealing five key factors influencing GA adoption: staff levels and resources, legal and regulatory systems, customer demands, legal and educational systems, stakeholders, managers' perceptions, and internal resources. However, this study also had limitations, such as a limited number of samples and its focus solely on the construction industry. Additionally, the design of the survey questions might have led to inaccuracies in the respondents' answers.

## 2.2. GA affecting enterprise performance

With the current development trend of the "green economy," GA is considered a direction of transformation according to the mode of development. The new and long-term approach is in line with the general development trend of the global economic system. GA makes environmental expenditure a part of the operational cost; thus, new thinking should be adopted for product design in order to maintain the existing profits and enhance firm performance ([Tu and Huang, 2015](#)). In Vietnam, the economy is more or less affected by wastes that are harmful to the "green" nature of the economy by businesses in the production and business process. Therefore, businesses need to have an accounting system that recognizes environmental factors and recovers costs of sustainable environmental improvement, called GA. However, it is not easy to recognize income and expenses from the environment ([Farouk et al., 2012](#)) because expenses are often hidden, making them difficult to recognize.

[Basseey et al. \(2013\)](#) conducted a study to understand how environmental accounting affects the performance of a company in Nigeria's oil and gas sector. They gathered information through a survey and also used existing data. This data was then examined using a statistical method known as Pearson correlation, which was carried out with the help of SPSS software. The findings indicated that the

costs related to the environment positively influence the company's performance. These environmental costs are reported in the company's financial statements and annual reports. These reports are useful for investors who are interested in the company's affairs. The study suggests that companies should openly report their environmental issues. This will not only help monitor and improve company performance but also ensure adherence to environmental protection laws.

[Riyadh et al. \(2020\)](#) analyzed the impact of GA on financial performance. The authors collect data from annual reports, financial statements, sustainability reports, and corporate CSR. In this study, the author represents GA as environmental cost (EC) for operational efficiency, which is represented as return on capital employed (ROCE). Research has shown that GA has a negative relationship with financial performance.

[Iliemena \(2020\)](#) investigated the impact of environmental accounting practices on the performance of Nigerian-listed oil and gas companies in the period 2012-2018. The author collects data from stock market facts, corporate sustainability reports, and companies' annual reports. The author uses a simple linear regression model. Research results show that environmental accounting has a significant positive impact on revenue and return on capital employed. On the other hand, environmental accounting has a positive effect on net profit, but it is not significant. Therefore, the author recommends that businesses that want to ensure their sustainability need to expand management accounting and financial reporting systems to environmental accounting.

Through data collected from green industry manufacturing companies listed on the Indonesian stock exchange in the period 2017-2020, [Dura and Suharsono \(2022\)](#) determined the impact of GA on sustainable development and financial performance. On the other hand, the authors analyze the impact of financial performance on sustainable development and GA on sustainable development through financial performance. The study used a non-probability convenience sampling method from 39 different companies and then analyzed the data using path analysis. Research results show that GA has a positive impact on sustainable development and financial performance, and GA has an impact on long-term development through financial performance.

[Rahman and Islam \(2023\)](#) used Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze data from 326 responses from a Bangladeshi pharmaceutical and chemical company. The authors collected answers using a simple random sampling technique to understand the correlation between GA, energy efficiency, and environmental performance and the correlation between energy efficiency and GA environmental performance. The results show that the relationships are all positive, in which environmental activities have the highest impact.

The findings of this study highlight the need to adopt GA to promote environmental sustainability.

The process of reviewing studies shows the diversity of factors in both breadth and depth. It can be seen that the topic of GA is of interest to many domestic and foreign researchers. However, studies have been conducted from different angles on the role of GA in the development of the economy in general and of enterprises in particular. In Vietnam, research on GA stops at articles with the author's own views and opinions, mainly qualitative studies. Synthetic studies on the groups of factors affecting the promotion of enterprises in Vietnam to apply GA and the impact of GA on performance are lacking. Inheriting the views of previous studies, the author will conduct a survey of listed companies on Vietnam's stock market. From there, the author analyzes the survey results to identify factors that can affect the promotion of the application of GA in enterprises listed on Vietnam's stock market.

From theoretical and practical research, the author proposes the following hypotheses for listed companies on Vietnam's stock market:

- H1:** Factors enterprise have a positive impact on GA.
- H2:** Professional associations have a positive impact on GA.
- H3:** State management agencies have a positive impact on GA.
- H4:** Incentives from stakeholders have a positive impact on GA.
- H5:** Potential for business expansion has a positive impact on GA.
- H6:** GA has a positive impact on enterprise performance.

### 3. Research methods

The research aimed to investigate the factors influencing GA in companies listed on the Vietnamese stock market. Initially, the researcher integrated various scales during the qualitative research phase to create a survey questionnaire. This was followed by data collection, initial analysis, adjustment of the scale, and refinement of the research model before the formal study commenced. For data analysis, the researcher utilized SPSS and AMOS software. The primary objective of this study was to assess and verify the reliability of the scale measuring the impact of various factors on GA, as well as the influence of GA on the performance of the companies listed on the Vietnamese stock market.

As of July 15, 2023, the Vietnamese stock market had a considerable number of enterprises listed, totaling 1,870. However, due to constraints in resources and the high cost involved, it was not feasible for the author to survey all these companies. Following the guidelines suggested by [Brewerton and Millward \(2001\)](#), the author decided to focus the study on a more manageable sample. This led to the selection of enterprises listed on the Hanoi Stock

Exchange (339 enterprises as of July 15, 2023<sup>†</sup>) and the Ho Chi Minh Stock Exchange (511 enterprises as of July 15, 2023<sup>‡</sup>). Consequently, the total number of enterprises included in the study was narrowed down to 850.

In this study, advanced analytical methods such as EFA, CFA, and SEM were employed. Consequently, the selection of the sample needed to adhere to specific sampling criteria. The study incorporated 33 observed variables, which included 24 scales for five independent variables, five scales for intermediate variables, and four scales for dependent variables. According to [Bollen \(1989\)](#), the study should have as many samples as the number of questions asked. Therefore, the minimum sample size required for this study was calculated as 33 variables multiplied by 5, resulting in 165 samples.

To ensure a sufficient and representative sample size for analysis, the authors distributed 850 questionnaires to companies listed on the Vietnamese stock exchange, with each company providing one respondent. After disseminating the questionnaires to 850 companies, 305 responses were received, which exceeds the minimum requirement of 165 responses. This amounted to a response rate of 35.88%. Among these, 22 responses were incomplete, leaving 283 complete and usable responses for analysis. This constituted 33.29% of the total responses, including 113 from the HNX and 170 from the HOSE. According to [Baines and Langfield-Smith \(2003\)](#), this response rate is adequate for conducting statistical analysis and drawing inferences.

To conduct the survey, all items in this study were designed with a 5-point Likert scale (1 = strongly disagree and 5 = strongly agree).

The research process was carried out by direct interview technique combined with sending questionnaires by post, email or via Google Docs. Survey subjects of the study: Board of directors of enterprises, chief accountant, accounting of operating parts, and other departments in HNX and Hose enterprises such as internal control. Each business represents one survey respondent.

The research model proposed by the author is shown in [Fig. 1](#).

### 4. Research results

According to [Table 1](#), Cronbach's Alpha coefficient of the factor PA reached the largest value, 0.948, and Cronbach's Alpha coefficient of factor PB reached the lowest value, 0.788. Cronbach's Alpha coefficient of factors > 0.7. The scales in [Table 1](#) are reliable; The correlation coefficient of the total variable and the coefficient "Cronbach's Alpha if Item Deleted" meet the requirements, showing that the variables are closely correlated. The author analyzed

<sup>†</sup> [https://24hmoney.vn/companies?industry\\_code=allandfloor\\_code=HNXandcom\\_type=allandletter=allandpage=1](https://24hmoney.vn/companies?industry_code=allandfloor_code=HNXandcom_type=allandletter=allandpage=1)

<sup>‡</sup> [https://24hmoney.vn/companies?industry\\_code=allandfloor\\_code=HOSEandcom\\_type=allandletter=allandpage=2](https://24hmoney.vn/companies?industry_code=allandfloor_code=HOSEandcom_type=allandletter=allandpage=2)

31 variables belonging to 7 factor groups, in which, running Cronbach's Alpha for the first time, the author removed two variables, PB3 and PB4. The author continues to the next steps. The author continued to analyze EFA exploratory factors. The results showed that KMO = 0.882 ( $0.5 < 0.882 < 1$ ) satisfied the condition. Bartlett test results p-value =

$0.000 < 0.05$  shows that the variables have a relationship with each other, consistent with the sample data (Table 2).

The results showed that six factors were extracted with total deduction variance (TVE) explained by seven factors greater than 50% (Table 3).

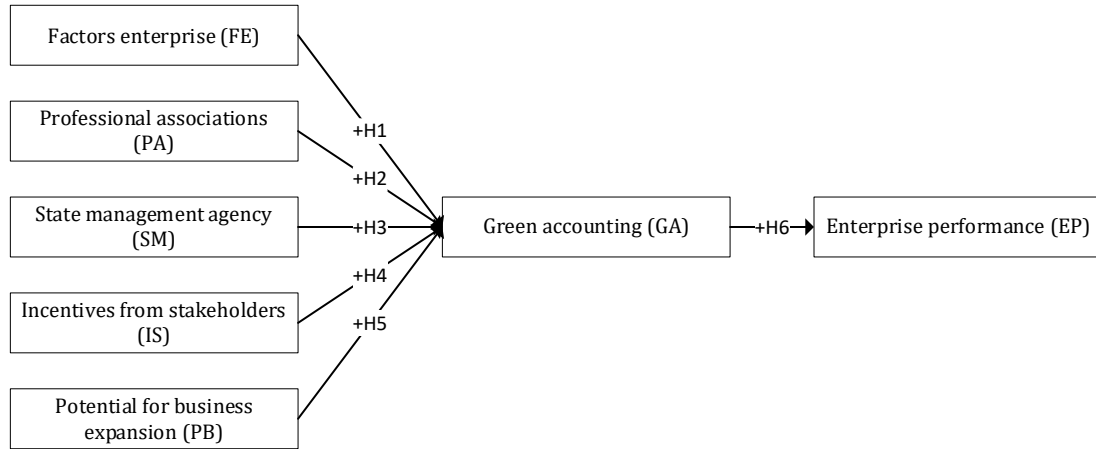


Fig. 1: Research model

Table 1: Cronbach's alpha analysis results

Factor	Cronbach's alpha	Number of observations	Factor	Cronbach's alpha	Number of observations
FE	0.914	6	PA	0.948	5
SM	0.919	4	IS	0.896	4
PB	0.788	3	GA	0.875	5
			EP	0.881	4

Table 2: EFA analysis result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin measure of sampling adequacy		.882
Bartlett's Test of Sphericity	Approximate Chi-square	7204.836
	df	465
	Sig.	.000

Table 3: Pattern matrix<sup>a</sup>

	Component						
	1	2	3	4	5	6	7
PA4	.987						
PA5	.977						
PA2	.866						
PA1	.831						
PA3	.757						
FE2		.879					
FE6		.834					
FE4		.816					
FE3		.800					
FE5		.735					
FE1		.713					
SM4			.954				
SM2			.868				
SM1			.823				
SM3			.795				
GA4				.895			
GA2				.826			
GA5				.796			
GA3				.719			
GA1				.543			
IS2					.924		
IS3					.845		
IS4					.805		
IS1					.753		
EP4						.884	
EP2						.872	
EP1						.773	
EP3						.601	
PB1							.794
PB5							.743
PB2							.672

Extraction method: Principal axis factoring; Rotation method: Promax with Kaiser normalization; a: Rotation converged in 6 iterations

Hair et al. (2017) suggested that for satisfactory convergence in research, the Composite Reliability

index should be greater than 0.7, and the Average Variance Extracted (AVE) index should exceed 0.5. In

the study, the values listed in Table 4 meet these criteria, indicating a high level of convergence. Consequently, the variables are deemed suitable for further analysis, as outlined in Table 5. In Table 5, values that are bolded, along with cross-loading factors, should have a higher significance compared

to other variables, meeting the criteria for discriminant validity. The research variables and scales presented in Tables 4 and 5 meet the necessary standards for inclusion in subsequent stages of analysis.

**Table 4: Convergence value analysis**

Factor	CR	AVE
FE	0.916	0.646
PA	0.946	0.779
GA	0.878	0.592
SM	0.921	0.746
IS	0.899	0.691
EP	0.885	0.659
PB	0.789	0.556

**Table 5: Discriminant validity**

Factor	FE	PA	GA	SM	IS	EP	PB
FE	0.803						
PA	0.288	0.883					
GA	0.487	0.354	0.769				
SM	-0.059	-0.169	-0.005	0.864			
IS	0.342	0.316	0.356	0.034	0.831		
EP	0.388	0.540	0.368	-0.286	0.195	0.812	
PB	0.409	0.165	0.413	-0.215	0.309	0.315	0.746

After assessing the reliability of the scale using Cronbach's Alpha coefficient and EFA, the authors proceeded to use CFA. This was to evaluate how suitable the scale and the collected data were. The research model included several latent variables, namely Enterprise factors, Professional associations, State management agencies, Incentives from stakeholders, Potential for business expansion, and Business performance. According to Hair et al. (2017), the appropriateness of the scale components was determined through key model indices. These indices included a Chi-square/df ratio of 2.019, which is less than 3, a CFI of 0.940, which exceeds the threshold of 0.9, a TLI of 0.933, and a RMSEA of 0.060, falling below the maximum of 0.08 (Fig. 2). Additionally, the absence of correlation between measurement errors indicated that the observed variables were one-directional. This implies that each observed variable was used to measure only one latent variable corresponding to a specific research concept. Fig. 3 shows a linear structure model of SEM showing that the indicators are suitable for market data (Chi-square/df = 2.201; CFI=0.929; RMSEA = 0.065). SEM linear structure model analysis also gives the following test results.

Table 6 presents the findings where the influence of FE on GA is the most significant, with a value of 0.284. Conversely, the impact of IS on GA is the least strong, shown by a value of 0.101. However, it is important to note that the factors SM and IS on GA did not show a statistically significant effect. This is indicated by their p-values being greater than 0.05 (p=0.136 and p=0.097, respectively), which is the commonly accepted threshold for statistical significance.

**5. Discussion**

The results of parameter estimation in Fig. 3 and Table 6 show that the relationships are statistically significant. Specifically:

- The relationship between factors enterprise and GA has a positive impact (standard regression weight  $\beta = 0.28$ ;  $p < 0.05$ ), so hypothesis 1 is accepted (H1: Factors enterprise have a positive impact on GA). The results are consistent with the study results of Van (2022). The research results also show that corporate factors have a direct and important role in promoting the application of GA in Vietnam.
- The next results show that the relationship between Professional associations and GA has a positive impact (standard regression weight  $\beta = 0.21$ ;  $p < 0.05$ ), so hypothesis 2 is accepted (H2: Professional associations have a positive impact on GA). This result is contrary to previous studies of Van (2022). This finding aligns with the actual situation in Vietnam. In this context, professional groups like the Association of Auditors and Vietnamese practicing accountants play a significant role. They guide and assist businesses in conducting financial and accounting tasks, which influences the adoption of GA practices in these enterprises. Moreover, the implementation of accounting systems, including GA in Vietnamese companies, is heavily affected by the rules and policies set by specialized regulatory bodies. These include the Ministry of Finance and the Ministry of Natural Resources and Environment. These organizations have a substantial impact on how accounting is applied within businesses in Vietnam.
- The relationship between State management agency and GA has a negative impact (standard regression weight  $\beta = 0.11$ ;  $p = 0.136 > 0.05$ ), so hypothesis 3 is not accepted (H3: State management agencies have a positive impact on GA). The results are contrary to the study results of Van (2022). Thus, state management agencies such as the Government, the Ministry of Finance, and the Ministry of Natural Resources and Environment have a very important role in promoting the application of GA in Vietnam.

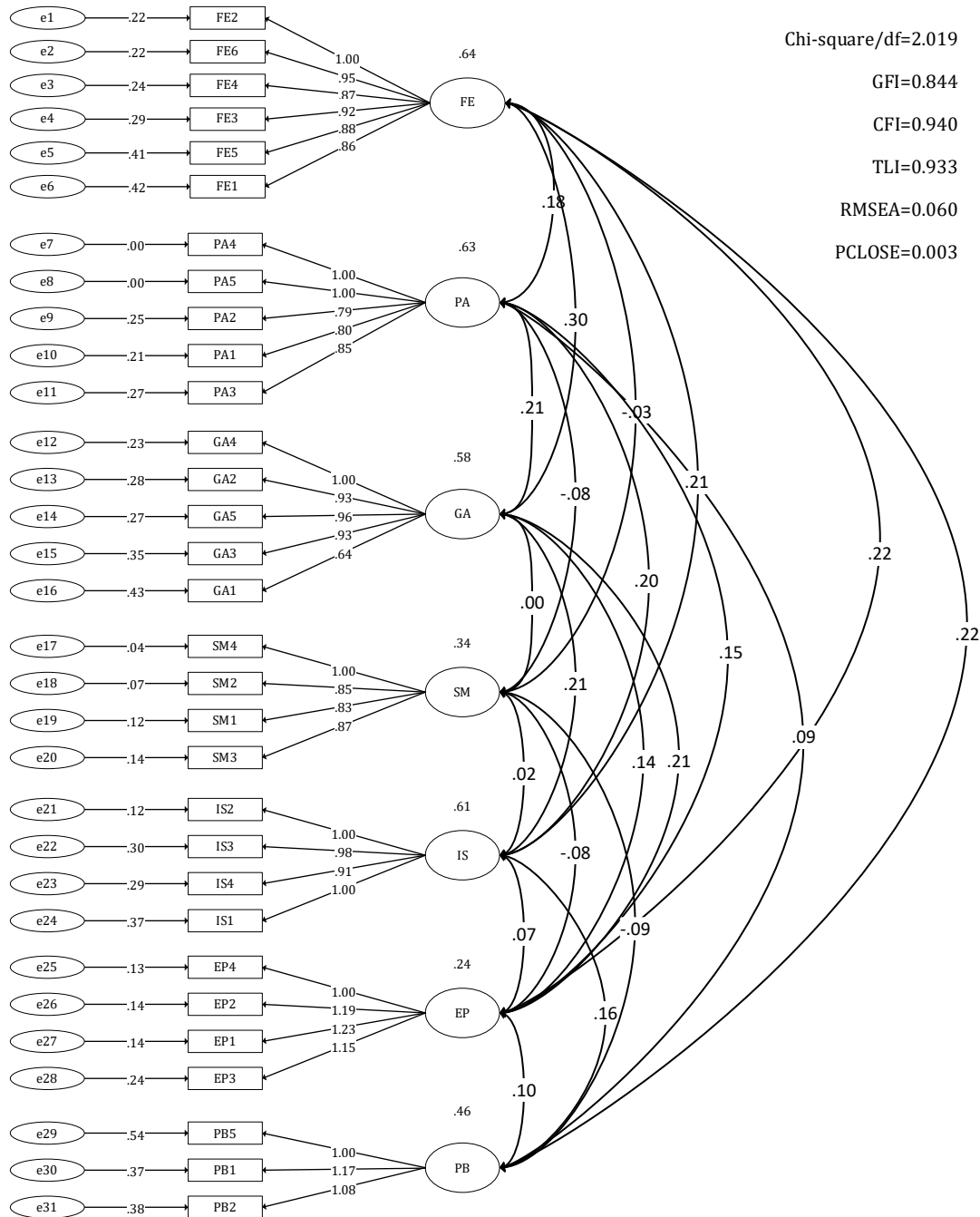


Fig. 2: Results of model fit assessment through CFA

- The next results show that the relationship between Incentives from stakeholders and GA has a negative impact (standard regression weight  $\beta = 0.10$ ;  $p = 0.097 > 0.05$ ), so hypothesis 4 is not accepted (H4: Incentives from stakeholders have a positive impact on GA). This result is contrary to previous studies of [Khiem and Cong \(2021\)](#) and [Rahman and Rahman \(2020\)](#). That shows that businesses have not really cared about environmental impacts and included them in their development strategies. Managers have not integrated environmental and social aspects into a sustainability factor that businesses need to pay attention to.
- The relationship between the potential for business expansion and GA has a positive impact (standard regression weight  $\beta = 0.27$ ;  $p < 0.05$ ),

accepting hypothesis H5 (H5: Potential for business expansion has a positive impact on GA). This result is consistent with previous studies by [Hsiu-Yu et al. \(2018\)](#) and [Khiem and Cong \(2021\)](#). Thus, businesses applying GA gain a competitive advantage, and the company's added value also increases thanks to the potential for business expansion. Including environmental costs in the accounting system will help companies improve their environmental performance, enhance their image, and increase shareholder cooperation.

- Hypothesis H6 shows that GA has a positive and significant impact on enterprise performance. Accept hypothesis H6: GA has a positive impact on enterprise performance (standard regression weight  $\beta = 0.25$ ;  $p < 0.05$ ). This result is consistent with the results of [Bassey et al. \(2013\)](#), [Dura and](#)

Suharsono (2022), and Rahman and Islam (2023). The study highlights the importance of GA in improving the performance of enterprises. It suggests that the adoption of GA can boost a company's reputation and competitive edge. In practice, when companies account for and report environmental costs, they often receive favorable

responses from investors, shareholders, and customers. This practice showcases the company's commitment to social and environmental responsibilities, which is crucial for sustainable business development. Such an approach is likely to lead to enhanced performance of the enterprise.

Chi-square=920.108; df=418; P=0.000; Chi-square/df=2.201; GFI=0.831; TLI=0.921; CFI=0.929; RMSEA=0.065

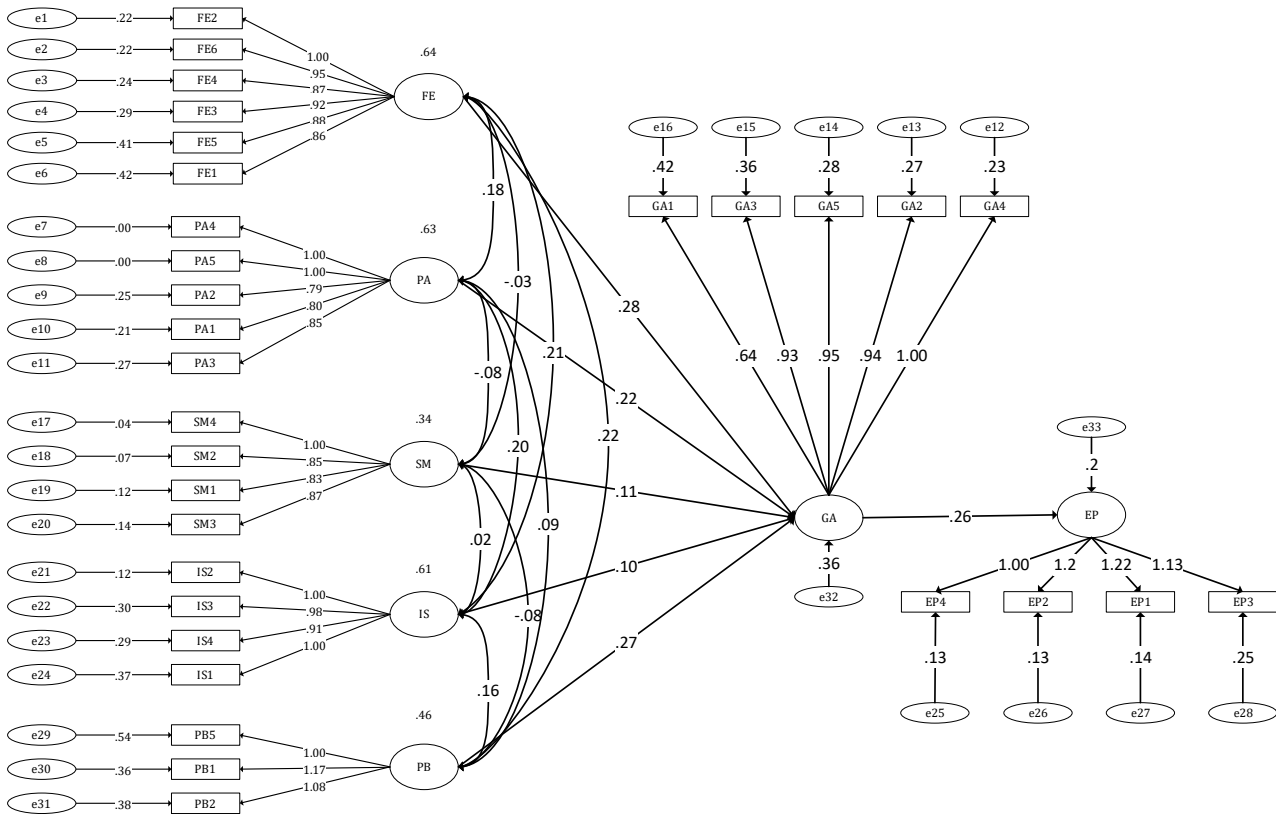


Fig. 3: SEM model theoretical analysis results

Table 6: Model test results

			Estimate	SE	CR	P
GA	<---	FE	.284	.063	4.526	***
GA	<---	PA	.219	.055	3.941	***
GA	<---	SM	.110	.074	1.490	.136
GA	<---	IS	.101	.061	1.658	.097
GA	<---	PB	.274	.081	3.386	***
EP	<---	GA	.256	.043	6.019	***

\*\*\*: p < 0.05

## 6. Conclusions

The GA model is relatively new in Vietnam. While it has been explored in developed countries for many years, its popularity is just growing in emerging economies. The author's aim with this study is to contribute to both theoretical and practical knowledge on GA in Vietnam and other developing countries. The analysis revealed that out of five factors, three—Enterprise Factors, State Management Agency, and Potential for Business Expansion—impact GA. However, Incentives from Stakeholders and Professional Associations did not show statistical significance in this model. Additionally, the study found that GA positively influences operational efficiency. Implementing GA in enterprises is an extensive and ongoing process. It

requires serious commitment and collaboration among various departments, management agencies, and businesses. There is a need for increased awareness among these entities about the importance of GA, specifically environmental accounting, to encourage its broader application. Many business managers currently underestimate the cost benefits of environmental accounting, not realizing that environmental costs are often lower than the taxes, fees, or fines associated with environmentally harmful activities.

Current financial regulations, standards, and accounting practices do not sufficiently cover information on environmental costs. Therefore, there is a need to further develop and refine legal frameworks related to GA. Businesses should increase their awareness of the importance of GA,



considering it an integral part of their accounting system. Agencies like the Ministry of Finance and the Ministry of Natural Resources and Environment should create clear and unified regulations for environmental management and cost accounting.

Businesses need to understand the advantages of incorporating GA practices. Accounting for environmental costs is generally less expensive than facing fines for environmental damage. Businesses could consult with environmental experts, estimate environmental costs in their operations, reduce resource wastage, and improve production efficiency.

When companies include environmental costs in their reports, they often receive positive feedback from investors, shareholders, and customers. This reflects the company's commitment to environmental and societal responsibility, contributing to sustainable business development and enhancing its competitive position. The study does have limitations:

- The data collection relied on survey questionnaires and non-probability convenience sampling. Although this approach didn't significantly influence the results, future research might benefit from using other sampling methods.
- The sample size, being only a third of the total population and with a relatively low response rate, is a significant limitation. Alternative methods like least squares can address the issue of small sample sizes. Future studies could use least squares to include moderating variables in the model.
- The study focused only on businesses listed on the Hanoi and Ho Chi Minh City Stock Exchanges, not encompassing all businesses on the stock exchange. Future research could broaden the scope for more comprehensive findings.

Despite these limitations, the study's findings remain valid and contribute to expanding research on GA. These limitations are acknowledged to guide future research in this field.

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## Compliance with ethical standards

## Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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