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The Impact of Sustainable Supply Chain Management, Financial Management and Renewable Energy Management on Business Performance – As Evidenced by Listed Enterprises in Vietnam

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Abstract - **This study examines Sustainable Supply Chain Management (SSCM), Enterprise Size (SIZE), Capital Structure (LEV), and Renewable Energy Management (RE) on the Business Performance of Listed Vietnam Companies. The data were obtained from 190 valid questionnaires completed by senior managers of enterprises listed on HOSE, HNX, and UPCoM, who were surveyed online from January to August 2024. In order to make the measurement scale robust, some preliminary tests were carried out in SPSS to test reliability and validity, and then the quantitative analysis was carried out using CB-SEM in AMOS. According to the empirical results, SSCM and capital structure (LEV) have a statistically significant positive effect on business performance at the 1% significance level, and this proves that it is very important to integrate sustainable practices into the processes of the supply chain and to optimize the financial structure for the efficiency of the business operations. In contrast, the contribution of enterprise size (SIZE) and renewable energy management (RE) was not statistically significant in this context, indicating that their association with business performance may be different in various industry sectors, organizational preparedness, or resource availability. The results highlight the need for businesses to integrate sustainability goals into their operations, improve green supply chain efforts, and manage their finances more effectively to boost efficiency and sustainability. The study can be used by managers in emerging economies to provide practical insights and evidence-based recommendations to consider integrating sustainability, financial, and operational information in strategic decision-making, which will help achieve the larger objectives of sustainable enterprise development and responsible business practices.**

Keywords: **Sustainable Supply Chain Management, Renewable Energy, Financial Management, Company Size, Financial Leverage, Asset Utilization Performance**

I. INTRODUCTION

The success of a business enterprise is indispensable for its survival and growth. Improving business efficiency is one of the main concerns, especially in politically sensitive environments, facing epidemics and the Fourth Industrial Revolution. Many businesses are unable to carry on under these pressures as their income dries up, cash flow is reduced, or they are forced into bankruptcy. For instance, the businesses in listed enterprises in Vietnam experienced business performance decline in 2021–2023, including more than VND 1,100 billion in business performance losses for some businesses (Hoa Binh JSC – HBC), and substantial losses (SMC, BCC, SCD, TTF, TKU).

The importance of corporate governance is more and more increasing to achieve efficient operating and sustainable development (Nguyen et al., 2023; Duy, 2024; Tien et al., 2020). Countries around the world have implemented various laws, principles and codes that emphasize transparency, accountability, and ethical business practices, such as the Sarbanes–Oxley Act (USA), the Hybrid Code of Governance (UK), and OECD principles. Good governance can help companies merge environmental, social and financial goals; it can help make strategic decisions that are profitable and socially responsible. The listed enterprises in Vietnam play an important role in the development of the economy and must adopt sustainable management practices in the supply chain, financial management and renewable energy for competitiveness and resilience in the market (Tien et al., 2020; Ngo et al., 2024).

The performance of businesses is different in different sectors. The ROE of large cap is higher than the mid and small cap and the financial sector has a high ROE trend (Hoa et al., 2025). In the retail and construction industry, and in SME's, there is a greater spread in the figures because of market and operational problems. The differences serve as an indicator of the need for strategic management and sustainability practices to improve the performance of operational and financial Famiyeh et al., (2021).

Research Questions

RQ1: What is the effect of sustainable supply chain practices on the business results of companies that are listed on the stock market in Vietnam?

RQ2: Is the significance of enterprise size on the business performance of listed enterprises in Vietnam high or not?

RQ3: What is the effect of capital structure on company's performance in listed enterprises in Vietnam?

RQ4: Does RM renewable energy play a crucial role in the corporate performance of listed companies in Vietnam?

The objectives are:

1. To evaluate how sustainable supply chain management affects business performance.
2. To look into how the size of an enterprise influences its performance.
3. To check how the capital structure impacts business performance.
4. To determine the effect of using renewable energy on business performance.
5. To give realistic suggestions to enhance operational efficiency and sustainable business performance of listed companies in Vietnam.

Key Contributions

- Develops an integrated model linking sustainable supply chain, financial management, enterprise size, and renewable energy to business performance.
- Provides empirical evidence from listed Vietnamese enterprises, showing that supply chain management and capital structure significantly affect performance.
- Offers practical insights for managers to use data-driven strategies to improve operational efficiency and sustainability.

The study is structured in the following way: The theoretical background and previous research on SSCM, which is highlighted in Section 2, financial management, size of enterprises, renewable energy management, and business performance. The research methodology, survey design, variable measurement and proposed research model are explained in section 3. The exploratory factor analysis, structural equation modeling results, reliability analysis, and hypothesis testing are presented in Section 4. The main results and their implications for sustainable business management are discussed in Section 5. Policy and managerial implications are given in Section 6. The paper completes with the main findings and limitations for further in Section 7.

II. Literature Review

Environmental, social and financial management practices are critical to the sustainable performance of business. The TBL theory is used to measure a business on three dimensions: Planet, Profit, and, People (Barbosa et al., 2020). Recent research have identified the lack of studies that could cover the integration of SSCM, financial management and renewable energy management at the same time.

2.1 Sustainable Supply Chain Management

The objective of the practices of the SSCM is to enhance operational efficiency and environmental sustainability (Duong et al., 2026). Researchers have found conflicting results: Some say there are short-term compromises between environmental efficiency and cost (Esfahbodi et al., 2016), but others say the benefits for operational and financial performance are long term (Zailani et al., 2012; Wang & Sarkis, 2013). SSCM can be applied to gain competitive advantage in green procurement, sustainable packaging and process optimization (Hasan, 2013; Luthra et al., 2015; Phan et al., 2020).

2.2 Financial Management

Financial management is very instrumental in cost control and the management of resources and capital efficiency. The theories of capital structure give the basis of understanding financial decisions and the impact of such decisions on firm value and risk. From empirical studies, it is evident that financial management can help in promoting SSCM and renewable energy by creating profitability that supports TBL (Tsai et al., 2025).

2.3 Renewable Energy Management

The NRBV highlights the environment-related resources for sustainable competitive advantage (Hart & Dowell, 2011). Research at the enterprise level level of renewable energy usage is limited and major studies are held at the macro level, on energy consumption and economic growth (Sadorsky, 2009; Pablo-Romero & De Jesús, 2016). Constraints in terms of finances, technology, or policies are barriers to adoption (Luthra et al., 2015); this points to the need for energy, financial, and governance practice integration.

2.4 Research Gap

Previous research primarily focuses on SSCM, financial management or renewable energy separately and few research studies take a holistic approach to all three elements in emerging economies. The gap in the study aims at creating an integrated model to evaluate the impact of these factors on the performance of businesses within the framework of TBL, based on empirical evidence for data-driven decision making in sustainable enterprise management.

III. Theoretical Foundation

This method is based on the TBL theory, which is a comprehensive approach to measuring business performance in three areas: environmental, social, and economic. TBL focuses on the fact that sustainable business success is not only the bottom line, but the positive impact on society and the environment. In reality, enterprise choice should consider profit maximization and social responsibility and environmental care and sustainability for long-term viability and sustainable growth (Barbosa et al., 2020). This study uses TBL to assess the contribution of managerial practices in the fields of supply chain management, financial strategy and the use of renewable energy in a holistic way.

In addition to TBL, the NRBV theories put emphasis on the strategic value of the environment-related resources and capabilities in achieving a competitive advantage. NRBV assumes that companies that can successfully build and use these resources like clean technologies, green innovation capacities and sustainable operational processes can increase their performance and efficiency over time (Hart & Dowell, 2011). The theoretical approach emphasizes the importance of organizational capabilities in addressing environmental and energy issues in the context of sustaining economic performance.

In combination, TBL and NRBV offer a comprehensive framework that connects the environmental, operational, and, financial aspects. In the scope of this study, SSCM is considered as the operational and social part, which is responsible to the production, logistics and supplier relationships. The size of the enterprise is dependent on the capacity and resources it has and affects the effectiveness of implementing sustainable strategies. The financial aspect is called capital structure, giving companies the ability to allocate their resources, benefit from investments in sustainability programs and risk reduction. Renewable energy management incorporates environmental and technological potential, contributing to the energy efficiency, compliance with regulations, and sustainable energy production.

Hypotheses

- H1: SCM has positive effects on business performance regarding sustainability.
- H2: Size of the enterprise positively affects business performance.
- H3: There is a positive relationship between business performance and the capital structure.
- H4: The management of renewable energy positively contributes to business performance.

In this paper, from the theoretical level, the TBL and NRBV are integrated to obtain a solid theoretical basis for evaluating the combined effect of environmental operational and financial management on enterprise performance. This strategy focuses on multiple organizational capacities and reinforces the need for a process of decision-making based on data and information that supports sustainable business results in emerging markets.

IV. Research Methods and Models

4.1 Research Design

The research was quantitative and cross-sectional, investigating the effects of SSCM, enterprise size, capital structure, and renewable energy management on the business performance of listed enterprises in Vietnam. A cross-sectional design was deemed suitable for this study since it aimed to evaluate the managerial perceptions within the predetermined data collection period of January-August 2024. The proposed relationships were statistically tested in AMOS software by CB-SEM. Data were prepared in SPSS and analyzed descriptively, reliability was assessed, and exploratory factor analysis was performed.

The study was based on the TBL and the Natural Resource Based View. These views underpin the study of operational, financial, and environmental management practices as key factors that influence sustainable business performance.

4.2 Population and Sampling Technique

The target population comprised senior managers in enterprises listed on the Vietnamese stock exchanges, such as the HOSE, HNX, and UPCoM. The unit of analysis was the management's judgments of each enterprise listed. The survey's questions were targeted for the answers of managers who had enough knowledge about enterprise operations, financial decisions, supply chain activities and energy-management practices, and a purposive sampling technique was applied. The directors, financial managers and business managers were chosen since they have direct involvement and responsibility in strategic and operational decisions that impact the business.

4.3 Inclusion and Exclusion Criteria

Respondents were included when the following conditions were satisfied:

1. The respondent was an employee of an enterprise quoted in the HOSE, HNX or UPCoM.
2. Respondent was a director, financial manager or business manager, at the senior or middle level.
3. The respondent had knowledge of the supply chain, financial management, operation of the enterprise or energy-use practices.
4. Respondent agreed to participate in study voluntarily.
5. The returned survey was filled out for all the measurement items.

Responses were excluded under the following conditions:

1. The respondent worked in an unlisted enterprise.
2. The respondent did not have an eligible managerial position.
3. There were significant missing data on the submitted survey.
4. Duplicate responses were identified.
5. Responses showed inconsistent or incomplete answer patterns.
6. Consent for participation was not obtained.

4.4 Proposed Model and Variables

The model that is proposed assesses the business performance as a function of sustainable supply chain management, capital structure, enterprise size and management of renewable energy:

$$\boldsymbol{PRO} = \boldsymbol{f}(\boldsymbol{SSCM}, \boldsymbol{LEV}, \boldsymbol{SIZE}, \boldsymbol{RE}) \quad (1)$$

Business performance (PRO) is the dependent variable as shown in equation (1). It is related to economic efficiency, operational result and socio-environmental performance. SSCM is the combination of sustainable practices in supply chain management. Capital structure (LEV) is a management of debt and equity resources. Enterprise size (SIZE) reflects the power and scale of an organization. Renewable energy management (RE) represents the use of environmentally friendly and clean energy.

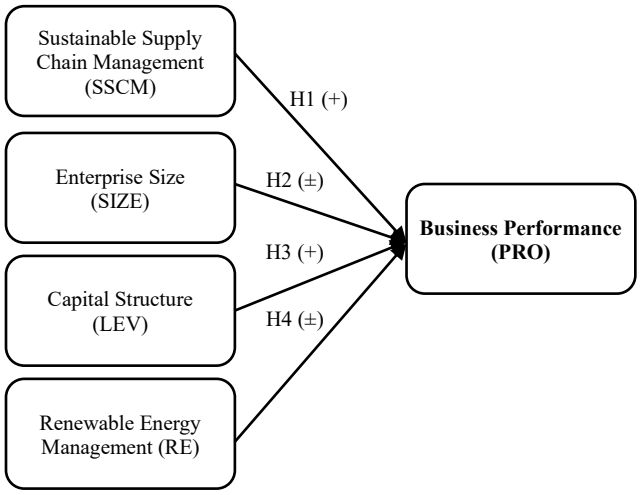


Fig. 1 Conceptual Framework of Business Performance Determinants

Fig. 1 highlights the hypothesized relationships between sustainable SCM, enterprise size, capital structure, renewable energy management, and business performance. For each factor, there is a related hypothesis that explains how the factor is related to the performance of the listed enterprises in Vietnam, showing the integrated model for analyzing the effect of the operation, financial, and environmental factors on the performance of the listed enterprises in Vietnam.

4.5 Data Analysis Procedure

The analysis was conducted in five stages. The profile of enterprises surveyed was summarised by descriptive statistics. Second, Cronbach's alpha and corrected item-total correlation was used to assess the scale reliability. Thirdly, exploratory factor analysis was performed based on Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity. Fourthly, the measurement model was tested in AMOS software, using the CB-SEM method. Lastly, the structural model was used to test the statistical significance of the proposed hypotheses.

4.6 Survey Instrument and Measurement

Each of the variables measured in the model was rated on a five-point Likert scale with values ranging from 1 (strongly disagree) to 5 (strongly agree). The survey instrument was created after having perused the existing literature and then was improved in detail through in-depth interviews with three economists, ranging from one to four hours each, conducted either face-to-face or over the phone. This process ensured contextually appropriate and conceptually congruent measurement items. After refinement of the instruments, the official survey was sent electronically to eligible managers. Responses collected were entered into an Excel spreadsheet and then into the SPSS and AMOS program for analysis. The results obtained were collated into an EXCEL spreadsheet in which 190 observations were obtained as indicated in table I below.

TABLE I STATISTICS ON CHARACTERISTICS OF THE SURVEY RESPONDENTS

Category	Type	Quantity	Ratio (%)
Kinds of firms	Shared firms	170	89.5
	Foreign-invested firms	12	6.3
	Others	8	4.2
	Total	190	100.0
Level of supply chain management	Medium	105	55.3
	Good	80	42.1
	Others	5	2.6
	Total	190	100.0
Energy source	Fossil energy	122	64.2
	Renewable energy	48	25.3
	Mixed energy	20	10.5
	Total	190	100.0
Location	Hanoi	115	60.5
	Ho Chi Minh City	65	34.2
	Other provinces or cities	10	5.3
	Total	190	100.0

The descriptive data shows that around 190 companies were chosen for this survey. The companies are mainly in Hanoi and Ho Chi Minh City as well as other cities in Vietnam. In terms of the nature of the enterprises, only a few were

foreign-invested joint-stock companies while the rest were local companies. Concerning their supply chain management, most companies were rated as having average efficiency (55.2%) meaning that Vietnamese businesses still have room to improve their supply chain efficiency. From the perspective of energy use, most companies are utilizing wind or solar energy (about 64.2%) and only about 25.3% have started to use fossil fuels.

On a theoretical basis, the author of the paper constructs the scales as follows (Table II):

TABLE II SCALES AND VARIABLES IN THE RESEARCH

No.	Code	Survey Questions	Citation
I	**Supply Chain Management (SSCM)**		
1.	SSCM1	Commitment to implementing green supply chain management (GSCM) from senior and middle managers.	(Esfahbodi et al., 2016; Zailani et al., 2012; Wang & Sarkis, 2013; Hasan, 2013; Luthra et al., 2015)
2.	SSCM2	Overall environmental quality management.	
3.	SSCM3	Environmental Audit and Compliance Program	
4.	SSCM4	ISO 14000 certified.	
5.	SSCM5	Management of the environment for the supplier's internal operations.	
6.	SSCM6	Provision of training to improve the environmental management capacity of suppliers.	
7.	SSCM7	Product design aimed at reducing material and energy consumption.	
8.	SSCM8	Product design aimed at avoiding or reducing the use of hazardous substances in the product and/or in the manufacturing process.	
9.	SSCM9	Application of reverse logistics.	
II.	**Leverage Management (LEV)**		
10.	LEV1	The company uses debt as an important tool to finance its business.	(Coase, 2008)
11.	LEV2	The use of loan debt helps businesses improve financial performance.	
12.	LEV3	The company always has the ability to reverse long-term loans.	
13.	LEV4	The company has good control over the financial risks arising from the use of leverage.	
14.	LEV5	The company uses financial leverage to support sustainable development activities.	
III.	**Enterprise Scale Management (SIZE)**		
15.	SIZE1	The company is large in size compared to its industry rivals.	(Coase, 2008)
16.	SIZE2	The company has a large and stable number of personnel.	
17.	SIZE3	The company has a wide range of activities (multiple markets/regions).	
18.	SIZE4	The company is likely to expand its operations in the future.	
19.	SIZE5	The current size of the company allows for the effective implementation of sustainable activities.	
IV.	**Renewable Energy Management (RE)**		
20.	RE1	Pollution prevention	(Hart & Dowell, 2011; Sadorsky, 2009; Pablo-Romero & De Jesús, 2016; Morsing & Perrini, 2009)
21.	RE2	Product Lifecycle Management	
22.	RE3	Clean Technology	
23.	RE4	Strategy towards the bottom of the pyramid	
24.	RE5	Managing partners in terms of renewable energy	
V.	**Business Performance (PRO)**		
25.	PRO1	Save costs and improve operational efficiency.	Expert Interviews
26.	PRO2	Improve product quality.	
27.	PRO3	Increase market share.	
28.	PRO4	Expand new market opportunities.	
29.	PRO5	Improve employee motivation and performance.	
30.	PRO6	Minimize solid/liquid waste and exhaust gases.	
31.	PRO7	Reduce the frequency of environmental incidents.	
32.	PRO8	Reduce power consumption.	

V. Results of Regression Model Testing

5.1 Reliability Analysis

To determine the reliability of the scales, Cronbach's alpha was used to demonstrate the consistency of the variables under the concept. Each item should have a corrected item-total correlation (CITC) above 0.3 (Hair et al., 2010) and a Cronbach's alpha above 0.7 is considered good. After checking the reliability, some items were removed from the scales: SSCM6, SSCM7, SSCM8, and SSCM9 were taken out of the SSCM scale, LEV3 was removed from the capital structure scale, SIZE5 was removed from the enterprise size scale, and RE4 and RE5 were removed from the renewable energy management scale. The other items in each scale had acceptable reliabilities. The Cronbach's alpha values for each construct are listed in table III, and the detailed item-total correlations are in table IV.

TABLE III SCALE ANALYSIS RESULTS

Scale / Construct	No. of Items	Cronbach's Alpha	Min. CITC	Result
Sustainable Supply Chain Management (SSCM)	5	0.829	0.537	Reliable (>0.7)
Capital Structure (LEV)	4	0.858	0.528	Reliable (>0.7)
Enterprise Size (SIZE)	4	0.831	0.599	Reliable (>0.7)
Renewable Energy Management (RE)	3	0.782	0.532	Reliable (>0.7)
Business Performance (PRO)	4	0.672*	0.303	Acceptable (>0.6)

TABLE IV ITEM-TOTAL STATISTICS FOR ALL RETAINED SCALES

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Sustainable Supply Chain Management (SSCM) — Cronbach's Alpha = 0.829					
SSCM1	15.81	6.610	.684	.504	.777
SSCM2	15.69	7.038	.704	.519	.774
SSCM3	15.97	6.629	.537	.318	.831
SSCM4	15.66	7.193	.655	.495	.787
SSCM5	15.62	7.552	.600	.452	.803
Capital Structure — Leverage Management (LEV) — Cronbach's Alpha = 0.858					
LEV1	10.75	3.740	.671	.519	.815
LEV2	10.31	4.105	.849	.804	.740
LEV4	10.30	4.388	.742	.727	.784
LEV5	10.38	4.420	.528	.396	.870
Enterprise Size Management (SIZE) — Cronbach's Alpha = 0.831					
SIZE1	10.56	4.142	.600	.434	.809
SIZE2	10.24	4.857	.599	.404	.799
SIZE3	10.33	4.344	.791	.627	.718
SIZE4	10.47	4.444	.635	.433	.783
Renewable Energy Management (RE) — Cronbach's Alpha = 0.782					
RE1	7.66	3.066	.593	.457	.743
RE2	7.46	3.249	.532	.350	.806
RE3	7.46	2.813	.761	.585	.559
Business Performance (PRO) — Cronbach's Alpha = 0.672					
PRO1	11.15	3.382	.303	.361	.355
PRO2	11.39	6.176	.340	.358	.672
PRO3	10.80	3.793	.477	.507	.306
PRO4	10.86	3.810	.412	.488	.358

5.2 Exploratory Factor Analysis (EFA)

Sample size of 190 observations was used, which is consistent with recommendations for samples below 350. The KMO index was obtained as 0.766 (in between the acceptable range 0.5 to 1.0), indicating that the sample is appropriate for conducting EFA. The Bartlett's test of sphericity was statistically significant (Chi-square = 3074.734, df = 190, p = 0.000), which indicates significant inter-correlation among the observed variables, and thus suitable for factor extraction. The scale structure had good convergent and discriminant validity as all the factor loadings were greater than 0.3 and total scale variance was greater than 50%. Table V shows the results of the EFA.

According to the theoretical basis in quantitative research, especially when applying the linear structure model (SEM), the measurement model needs to be tested for relevance with actual data through a system of standard evaluation indicators. This evaluation aims to ensure that the scales developed are capable of accurately reflecting the research concepts and that the proposed framework has a high degree of relevance to the data collected.

TABLE V EXPLORATORY FACTOR ANALYSIS

Item	Component 1	Component 2	Component 3	Component 4	Component 5
KMO = 0.766; Bartlett's Test: Chi-Square = 3074.734, df = 190, p = 0.000					
SSCM2	.871				
SSCM1	.863				
SSCM4	.817				
SSCM5	.803				
SSCM3	.448				
LEV2		.943			
LEV4		.865			
LEV1		.807			
LEV5		.680			
SIZE3			.916		
SIZE2			.827		
SIZE1			.823		
SIZE4			.795		
RE3				.904	
RE1				.824	
RE2				.750	
PRO1					.758
PRO2					.663
PRO4					.555
PRO3					.507

Specifically, the measurement model is considered satisfactory when it simultaneously meets a number of commonly appropriate indicators. First, the free-ordered Chi-square index (Cmin/df) needs to reach a value of less than 3, indicating an acceptable degree of deviation between the theoretical framework and the actual data. Second, comparative indices such as the TLI and the CFI need to reach a value greater than 0.9, reflecting how well the model fits compared to the independent model. Third, the Normed Fit Index (NFI) also needs to reach a threshold above 0.9 to confirm that the model has a high level of data interpretation. Finally, the RMSEA index needs to be less than 0.05, indicating that the approximate error of the model is acceptable.

The simultaneous satisfaction of these criteria indicates that the measurement model fits the market data well, ensuring the reliability and validity of the scales. This provides a good base for the next steps for verifying the structural research hypotheses and model.

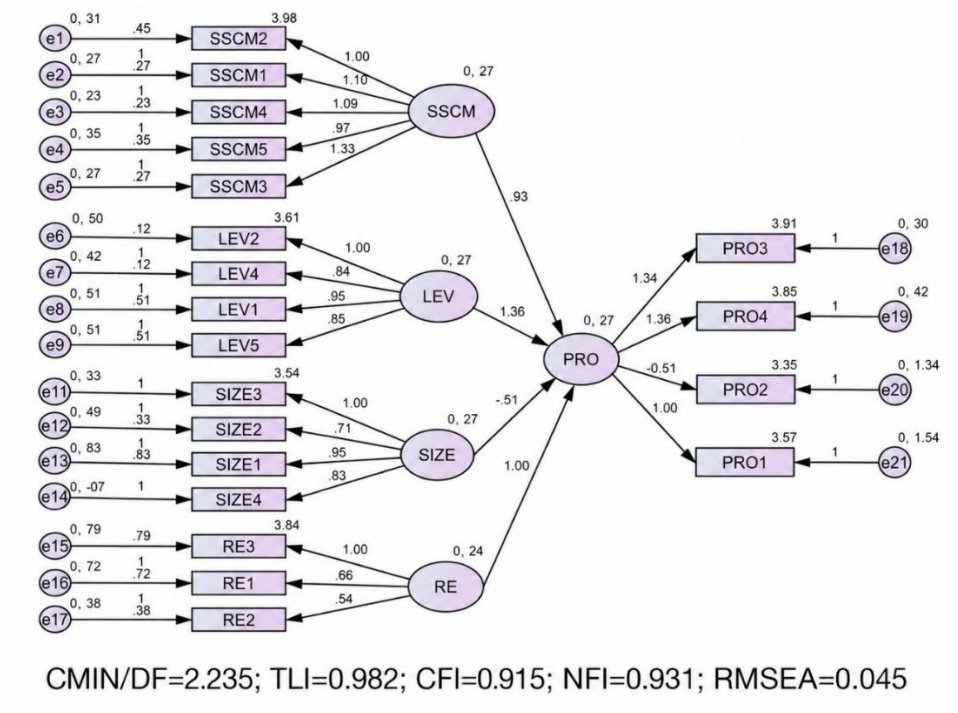


Fig. 2 SEM of Business Performance Determinants

Fig. 2 shows the relations among SSCM, capital structure, enterprise size, renewable energy management and business performance.

Table VI shows that the integration framework is suitable for actual data as it meets the verification criteria. The results of testing the measurement model using the SEM method show that the research model has a good degree of compatibility with market data. Specifically, the conformity assessment indicators have reached the acceptance threshold according to the standards in experimental studies. The Chi-square value adjusted for degree of freedom (CMIN/DF) is 2.235 (<3), indicating an acceptable deviation between the theoretical model and the observed data. At the same time, comparative indices such as the TLI = 0.982, CFI = 0.915, and NFI = 0.931 are all greater than 0.9, reflecting the model's high relevance compared to the standalone model. In addition, the RMSEA approximate error index has reached 0.045 (<0.08), indicating that the model has a low margin of error and is well matched with the actual data.

Furthermore, the factor load coefficients of all of the observed variables are acceptable, non-significant, and have good convergence value for scales. All variables measured, which corresponds to the concepts of SSCM, capital structure (LEV), enterprise size (SIZE), renewable energy management (RE) and operational efficiency (PRO), are strongly related to their potential variables. This indicates the scales employed in the study have good reliability and measurement values.

TABLE VI MODEL FIT ASSESSMENT

STT	Measurement and Tests	Symbols	Reference Value	Model Value
1	Chi-square adjusted for degrees of freedom (CMIN/df)	x2/d.f (CMIN/df)	$x2^{/d.f} <= 5$ CMIN/df<=5	2.235
2	Tucker-Lewis Index (TLI)	TLI	TL>0.90	0.982
3	Comparative Fit Index (CFI)	CFI	CFI>0.90 (closer to 1 is better)	0.915
4	Normed Fit Index (NFI)	NFI	NFI close to 1 is good	0.931
5	Root Mean Square Error of Approximation (RMSEA)	RMSEA	RMSEA<0.05 is appropriate	0.045

Table VII indicates that hypotheses H1 and H2 were accepted as the significance of the estimation coefficients: p-value<=0.05; confidence level >=95%. These hypotheses are hence supported by the factors used in the model. Hypotheses H3 and H4, on the other hand, are rejected based on the p-value>0.05.

TABLE VII HYPOTHETICAL TEST RESULTS

Hypothesis	**Impact**			**Coefficient**	**P-value**	**Label**
H1	FOR	<---	SSCM	0.933	***	Accepted
H2	FOR	<---	SIZE	0.053	0.089	Not supported
H3	FOR	<---	LEV	0.182	***	Accepted
H4	FOR	<---	RE	-0.039	0.063	Not supported

In the case of H1, the relationship between SSCM and business operational efficiency is positive and statistically significant at the 1% level, as observed in the previous studies, which include Esfahbodi et al., (2016), Zailani et al., (2012), Wang & Sarkis, (2013), Hasan, (2013) and Luthra et al., (2015). By leveraging effective SCM, businesses can streamline their expenses, increase product quality, ensure timely deliveries, and boost risk and market resilience. For listed companies in Vietnam, which are increasingly connected in global value chains, SSCM also can help listed companies comply with ESG and enhance the brand image.

For H3, capital structure positively affects business performance at the 1% significance level, aligning with classical and contemporary financial theories (Coase, 2008). An optimal capital structure reduces financial risk, improves resource allocation, and strengthens operational efficiency, enabling enterprises to respond effectively to opportunities and challenges from economic integration and sustainable development requirements.

In contrast, enterprise size and renewable energy management were not significant. The impact of renewable energy is limited by the early stage of the market, incomplete regulations, and low investment incentives. Differences in company scale also create heterogeneous capabilities to implement sustainability strategies, explaining the lack of uniform effect on operational efficiency.

VI. Discussion

Based on the results, the positive effect of SSCM on business performance is the highest (β = 0.933), which corresponds to the TBL framework. Social aspects and environmental are incorporated into the activities of supply chains, including green procurement, environmental auditing, ISO 14000 certification and reverse logistics, which increase the effectiveness of supply chain operations, product quality and market responsiveness. On the other hand, for the Vietnamese listed enterprises that are more and more participating in global value chains, SSCM is a source of competitive advantage and helps them become more resilient

to market fluctuations and external shocks like the COVID-19 pandemic.

The impact of capital structure (LEV) also is positive and significant (β = 0.182), which supports agency theory and trade-off theory. The right debt-to-equity mix lowers capital expenses, enhances credit standing, and makes it easier to fund sustainability projects, ensuring profitability and sustainable development. Enterprise size (SIZE) and renewable energy management (RE) were not statistically significant, however. This is due to the diverse size of companies, the complexity of their structure, and the fact that the renewable energy market in Vietnam is still in its infancy, making it difficult to measure the impact of the initiatives and incentives for the majority of companies.

The results of these studies have significant implications for managers and policy makers. Managers need to focus on building the SSCM practices, incorporate sustainability and financial indicators into decision-making dashboards, and keep the capital structure optimal for operational and strategic goals. The investments in renewable energy should be done as medium to long term projects with energy audits and pilot projects. One way to support this shift is by implementing more robust ESG reporting frameworks, providing financial incentives to promote renewable energy usage, and offering capacity-building initiatives for listed companies. Future studies may expand the model to incorporate technology adoption, human-resource capabilities, quality of corporate governance, and longitudinal designs to investigate causal relationships and the changing effects of renewable energy management.

VII. Conclusion

This research was to investigate the impact of sustainable SCM, capital structure, enterprise size, and renewable energy management on the performance of listed enterprises in Vietnam. The research was based on the theory of the TBL and conducted on the empirical data obtained from the survey of 190 top-level managers in listed enterprises on HOSE, HNX, and UPCoM. The empirical results show that sustainable supply chain management is positively correlated with enterprise performance, with a coefficient of 0.933 and statistical significance at the 1% level. The capital structure has a positive correlation and statistical significance with a coefficient of 0.182. This indicates that efficient practices in supply chains and proper financial structure have a crucial role in increasing competitiveness and operational efficiency. Enterprise size and renewable energy management did not affect the performance of enterprises statistically significantly. This implies that the advantages associated with scale economies and renewables-based strategies will be subject to the prevailing context, investment ability, technological advancement, and the development of sustainable initiatives within a specific sector. The study calls for listed corporations to invest in sustainable practices, optimize resource utilization, and incorporate both financial and operational data in decision-making processes. The present study focused only on listed companies in Vietnam and did not consider other variables like digital technology and human resource skills. It could be interesting in future studies to include these aspects in the model.

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