WPOM

Working Papers on Operations Management.
Vol. 15, Nº1 (112-131)
ISSN: 1989-9068

https://doi.org/10.4995/wpom.21495

Can sustainable supply chain strategies of company enhance for mitigation of risk damages and long-term resilience? An empirical analysis for the context of COVID-19 pandemic

Nguyen Thi Ngoc Hoa [a], Khuu Thi Phuong Dong [b*], Nguyen Quoc Hung [c], Nguyen Minh Canh [d]

[a] Lecturer at School of Economics, Can Tho University, Vietnam (*Email:* ntnhoa@ctu.edu.vn), [b*]Corresponding author, Advanced Senior Lecturer at School of Economics, Can Tho University, Vietnam (*Email*: ktpdong@ctu.edu.vn), [c]Undergraduate student at School of Economics, Can Tho University, Vietnam (*Email*: hungb2015365@student.ctu.edu.vn), [d] Lecturer at School of Economics, Can Tho University, Vietnam (*Email:* nmcanh@ctu.edu.vn)

Recibido: 2024-04-06 Aceptado: 2024-06-29

Abstract

This study aims to investigate the effects of sustainable supply chain management strategies of the companies on mitigation of risk damages and long-term resilience through the evaluation of stock abnormal returns of companies listed on the stock markets based on the evidence from the context of COVID-19 pandemic. The empirical analysis was conducted for 63 companies listed on Vietnamese stock market, where plays as an example for emerging stock markets. The data were collected from the quarterly official financial statements of 63 companies between January 2020 and March 2023. Various regression models, including Ordinary Least Squares, Fixed Effects Model, Random Effects Model, and Generalized Least Squares were explored. Found results indicated that the implementing sustainable supply chain management strategies might help to mitigate the negative impact on stock price volatility during the COVID-19 pandemic, but it has not been the critical tool to improve the companies' resilience ability in post pandemic yet.

Keywords: *sustainable supply chain, company's strategies, stock abnormal returns, risk damages, long-term resilience*

JEL Codes: *F65, F63, G11, G34, G38*

Codes of Sustainable Development Goals: *SDG17, SDG12, SDG02*

Introduction

Sustainable development has become a prioritized goal, whether at the national level or within organizations and companies (Burritt et al., 2011). Sustainable supply chain management has been addressed as the important strategies to improve the supply chain performance, in connection with the consideration of environment and social issues (Seuring & Müller, 2008; Le, 2020). From the scientific perspectives, sustainable supply chain management have been conducted in various previous studies, which aimed to figure out both of economic and non-economic (i.e. environment and social issues) performance of all activities of

the supply chain (Klassen & Whybark, 1999), as well as responsibility or ethics in supply chain construction and management (Golicic & Smith, 2013). In other words, the sustainability in supply chain management strategies must be implemented by all of participation in the supply chain with the contexts of the environmental, social, and governance problems. This means that a sustainable supply chain strategy must be a comprehensive operation activity that involves the coordination of all agents in the supply chain towards to create the economical benefits of the stakeholders involved in the chain with the consideration to protects the environments and social welfare (Pagell & Wu, 2009; Rajesh, 2019).

However, it should be noted that, the supply chain management strategies towards the sustainability must be carried out based on the supply chain management strategies platform, and be aligned with the companies' operation and business strategies in order to respond the customer's requirements regarding the sustainable aspects (Wittstruck & Teuteberg, 2012; Yang, 2013; Fasan et al., 2021). This means that the economical sustainability in the supply chain management strategies must be corresponded to the orientation of environment improvement and social welfare. In contrast, sustainability in environments and social aspects need to be considered based on the economic resources, especially the financial allocation to achieve the overall sustainability goals. The implementation of the sustainable supply chain management strategies, thus, have to be comprehensively conducted by all stakeholders in each stage along the supply chain (Kroes & Ghosh, 2010). Consequently, a company with the successful supply chain management strategy towards the sustainability might gain a higher and sustainable businesses performance, and meet the expectations of stakeholders through the improving operational stability, enhancing reputation, leveraging competitive capabilities (Bu et al., 2020).

Previous scholars (Clarkson, 1995; Eesley & Lenox, 2006; Mitchell, Agle, & Wood, 1997; Toan & Trinh, 2018) have been conducted to examine the efficiency of sustainable supply chain management strategies, and the effects of those strategies on the companies performances based on the resources based view theory (Barney, 1991), the resources- dependences theory (Pfeffer & Salancik, 1978; 2015), and the stakeholders theory (Freeman, 1984; 2010). Accordingly, the resource-based view theory (Barney, 1991) indicated that the sustainability in supply chain management strategies of the companies should be implemented with the prior utilization of the internal valuable resources towards to improve the social welfare, enhance the environment protection, and increase the business performance. It should be noticed that any business strategies of a company must be ensured the compatibility with the organizational structure and business orientation (Chandler, 1962). Considered that, supply chain management strategies of the companies, by themselves, are the integrated network to connect all activities and operations of all agents in the chain to distribute the products from the raw material to the production, distribution, and end-users (Mentzer et al., 2001). An organizational structure of the companies, therefore, are depended on the needs and the integration of both the internal and external stakeholders, including suppliers, customers, competitors, the government, the associations, and the labors (Yang, 2013). Any changes in the operations of the upstream stakeholders and/or in the products specification of the downstream stakeholders along the chain might lead to significant effects on the operations and business strategies of the companies. Therefore, the point of view of the resource dependence theory (Pfeffer & Salancik, 1978, 2015) and the stakeholder theory (Freeman, 1984; 2010) are also explored as the crucial perspectives in the scientific studies regarding sustainability in supply chain management strategies to ensure a mechanism of harmonizing of the interests for the stakeholders involved in all activities of the companies' supply chain management strategies.

A success strategy of sustainable supply chain management strategies consisted of the main functions, including supplier selection; awareness, implementation and monitoring of environmental and social issues of companies' suppliers, as well as willingness to collaborate of the companies' stakeholders in context of sustainability aspects. Sustainable supply chain management strategies in companies, therefore, plays as a long-term strategy for companies the stakeholders involved in the company's supply chain view it as an integrated, interconnected, and collaborative entity that meets the requirements of sustainable development in economic, environmental, and social aspects. The contribution of the sustainable supply chain strategies, thus, might help to maintain and improve the stability and resilience in firm's operation during risks and uncertainty scenarios (Fasan et al., 2021). In addition, the implementation of sustainable supply chain practices not only aimed reduce environmental impact and ensures social effectiveness but also help to enhance the operational efficiency for the companies (Quintana-García et al., 2021). It was because the companies that implemented sustainable supply chain practices might achieve the higher environmental and social performances, compared those to the other companies (Dzikriansyah et al., 2023).

In 2019, the COVID-19 pandemic occurred, and have the negative impact on various aspects of social and economic development all over the world (Khodoomi et al., 2023). This situation played as an example of uncertainty influencing the companies' operation due to the negative impacts on the operation of global supply chains and companies' performance (Hung et al., 2021). Companies, therefore, must pay more attention to enhancing sustainable supply chain strategies to be able to maintain the companies' operation stably. Besides that, the occurring the COVID-19 pandemic also have the negative influencing to global stock market (Zhang et al., 2020; Al-Awadhi et al., 2020). The most negative impact of COVID-19 on average stock market returns in the world was significantly addressed during January 20, 2020 to April 17, 2020 (Singh et al., 2020).

Similarly, despite Vietnamese Government have implemented diversified alternatives and regulations to reduce the negative effects of the COVID-19 pandemic, companies have been challenged in the operation activities, and faced to the reduction in performance. Especially, the negative effects of COVID-19 pandemic have reflected to Vietnam's stock market. This resulted of the fluctuation of the stock prices returns of companies listed on the Vietnamese stock market. During the period from 2020 to end of 2021, the Vietnam's stock market was trading with the weakness of market liquidity, and the dropping points of market index (Dang Ngoc et al., 2021). Regarding the effects of COVID-19 pandemic in Vietnam, from the scientific perspectives, several studies have been conducted to examine the effects of COVID-19 pandemic on the stock market in Vietnam. Most findings have indicated the stock price of companies listed on the market declined in the first three months of 2020. Especially, the Vietnamese stock market index have decreased by 28% compared to December 31, 2019, resulting in a market capitalization loss of 37.4 billion USD for the Vietnamese stock market (Hung et al., 2021; Che-Ngoc et al., 2023; Nguyen & Vo, 2023).

In July 2017, the Ho Chi Minh Stock Exchange (HOSE) collaborated with the Macroeconomic Reforms/Green Growth Programme of the Vietnam – German Cooperation (GIZ), and the State Securities Commission (SSC) to introduce the Vietnam Sustainability Index (VNSI), which aims to figure out the sustainable development standards related to the environment, social, and governance aspects for the listed companies. This index, thus, was expected to be useful for the organization and personal investors in identifying companies with sustainable growth potential. In the other words, the investors can evaluate the ability to maintain and improve the operational performance in the long term in a sustainable consideration.

The VNSI is calculated by using the market capitalization-weighted method with adjusted free-float ratios. It consists of the stocks of 20 companies, which were included in the list of VN100 companies listed on HOSE and indicated the highest sustainability development scores in three pillars, consisting of environment, social, and corporate governance (HSX, 2019). The sustainability development scores were calculated based on the database collected through structured questionnaire and conducted by HOSE. The list of VNSI companies is reassessed and updated July annually.

Several scientific studies have been conducted in the United States to examine whether companies that implement sustainable supply chain management strategies can minimize the negative volatility of the stock price during the COVID-19 pandemic based on the analysis of differences in abnormal stock returns during the COVID-19 outbreak and before (Fasan et al., 2021; Albuquerque et al., 2020). Found results have demonstrated that companies that have implemented the sustainable supply chain practices have less negative volatility in abnormal returns compared to that of the other companies. This suggests that sustainable practices in supply chain management can be useful for the companies to minimize the risk damages and maintain the stability of the stock prices in the uncertain situations, such as the COVID-19 pandemic. Those, then, may help to maintain the operation performance companies listed on the US stock market and other markets that correspond to the level of US market all over the world in the crisis.

Most of previous studies have been conducted in the US and developed stock markets, but are lacking of those kind of studies in the emerging markets, including Vietnam. Additionally, despite the term "sustainability" in supply chain management was not a new definition from a scientific perspective. Scientific studies about sustainable supply chain management also have been conducted. However, the alternatives of how to create a truly sustainable supply chain is still questionable (Ahmed et al., 2018). In Vietnam, several studies have been addressed to carry out the current situation and the awareness of agents among stages of supply chain regarding sustainable strategies implementation in the field of tourism and hospitality (Do et al., 2020), agriculture production (Kim, 2018), construction industry (Le, 2020; Do et al., 2020).

To the best of our knowledge, studies on the effects of conducting of sustainable supply chain strategies on operational performance, the stock price volatility and/or stock abnormal returns of companies listed on stock market in Vietnam are still limited (Le, 2020). This study, therefore, aims to examine the impact of sustainable supply chain strategies on stock abnormal returns of companies listed on emerging stock markets under uncertainties conditions (i.e., the COVID-19 pandemic) based on evidence from the Vietnamese stock market. The results of this study are expected to figure out a useful scientific platform for companies, investors, and stakeholders in the supply chain not only in Vietnam but also in other emerging markets to enhance the sustainability of supply chain management to improve the ability to tolerate and adapt quickly with uncertainties occurring in the stock market and other fields of economy.

Theoretical framework and hypotheses

In this study, the perspectives of resource based view theory (Barney, 1991), resource dependence theory (Pfeffer & Salancik, 1978, 2015), and stakeholder theory (Freeman, 1984; 2010) were explored to discuss that the implementation of sustainable strategies in the supply chain might enhance the ability to mitigate negative impacts in operation activities of companies in the uncertain events as suggested by (Fasan et al., 2021).

A company might simultaneously face the pressures related to the sustainability aspects in the supply chain management from both internal agents (i.e. employees, changes and perspectives of company leadership) and external stakeholders (i.e. direct suppliers, customers, shareholders, the community, and the government) in the operation progress (Zsidisin et al., 2005; Yang, 2013). The prior purposes of companies in the implementing sustainable supply chain management strategies might be to response the national laws issued by the government and the regulations pressured by the other stakeholders, such as industry association, and non-government organizations (Abbas & Tong, 2023). Besides that, the companies might be challenged to the requirements from their customers regarding the product improvements towards environmental and social welfare sustainability (Gelderman et al., 2008). Especially, those pressures are more complex under the uncertainty and risk conditions (i.e. in the context of COVID-19) because companies have to respond the fast changes from the stakeholders involved in the supply chain, such as the additional specification of the products to correspond the new business environment, and new requirements from customers (Fasan et al., 2020; Hoang et al., 2020). Based on the resource-based view theory, companies must address the business strategies that match the fundamental resources and their own advantages to capabilities to meet those requirements. The utilization of the core resources, then, might support a creating the added valued for the products, reduce the operation costs, and maximize profits to achieve sustainable competitive advantages in the long-term (Barney, 1991; Prahalad & Hamel, 1990; Wernerfelt, 1987).

However, as already mentioned, a company with a sustainable supply chain management strategy, not only has to force to utilize the internally fundamental resources, but also needs to rely the companies' commitments related to the environment and social aspects might play as the critical signals to call for the collaboration of stakeholders among the supply chain, especially suppliers and customers, towards the implementation of sustainable supply chain management strategies based on the resource dependence theory and the stakeholder theory. Fasan et al. (2021) have noticed that the investor's confidence for the companies with a strong sustainable supply chain might continuously increase in the long term according to the perspectives of resources-based view theory. This was explained because the comprehensive efforts to enhance sustainable supply chain management related to economics, environment and social aspects might become the valuable resources of companies in the long run (Barney, 1991). Those companies, therefore, can gain the consumer's confidences and a better collaboration with the stakeholders (Danso et al., 2019; Durugbo & Amankwah-Amoah, 2019). He & Harris (2020) have indicated that ethical issues in business asides, consumers paid more attention and were willing to buy more for the products with attachment signals about the environment and social responsibility of producers in the context of the COVID-19 pandemic. Those, then, might be meaningful for maintaining the operational performance and minimize the volatility stock prices of the companies in the crisis scenarios, and improving the competitive advantage in the long term. This was helpful for companies to cope with the challenges during the uncertainties occurring, and to rehabilitate the business activities after crisis periods (Rao & Holt, 2005).

On the other hand, companies' managers might gain the better knowledge and improve management skills regarding the supply chain management through implementation of sustainable strategies. This was expected that the companies' managers might make quick and effective decisions to response to the risk and uncertain events. They might react to various alternatives in multiple stages of the supply chain to reduce the probability of disruptions in production chain due to the interruption of supply of raw materials flows based on theory of resource dependence (Fasan et al., 2021). This might create investor's confidences that

the companies with a better sustainable strategy in the supply chain might have a better ability to maintain operations, at least, in the risks and uncertainties scenarios (Qiu et al., 2021). Based on the above arguments, this current study hypothesized that the implementation of the sustainable strategies in the supply chain might create the positive effects on the abnormal returns of companies listed on the Vietnamese stock market under risks and uncertainties scenarios based on the evidence from the context of COVID-19 pandemic.

H_1: Implementation of sustainable supply chain strategies creates positive influences on the stock abnormal returns of companies listed on Vietnamese stock market during and after the COVID-19 pandemic.

Control variables, including return on assets (ROA), financial leverage (LEV), size of company (Size), market-to-book ratio (MTB), and Tobin's Q ratio, were identified as the factors influencing the stock abnormal returns of companies listed on the stock market. Accordingly, ROA was indicated as one of the most important factors which reflects the operational performance of companies. A higher value of ROA is estimated to have a positive effect on the stock abnormal returns of companies (Mayuni & Suarjaya, 2018; Thuink, 2023). Besides that, according to the perspectives of based-view theory, a company must implement sustainable supply chain management strategies to achieve the environmental sustainability and social welfare based on the certain fundamental resources, especially the financial property (Carter & Dresner, 2001). Notably, any negative effects of the supply chain activities on the financial performance for the actors involved in the supply chain is not sustainability regardless of the benefits of environmental efficiency and society (Carter & Dresner, 2001; Carter & Rogers, 2008; Walley & Whitehead, 1994; Carroll, 1979). In contrast, as already mentioned, the sustainability in environment and society of the companies might be a positive sign to call for the trust and confidences from the stakeholders, including the shareholders (He & Harris, 2020; Fasan et al., 2021). The implementation of sustainable supply chain management strategies, therefore, plays as the moderator to support the improvement in financial resources for companies and create the increases in the abnormal return for the shareholders.

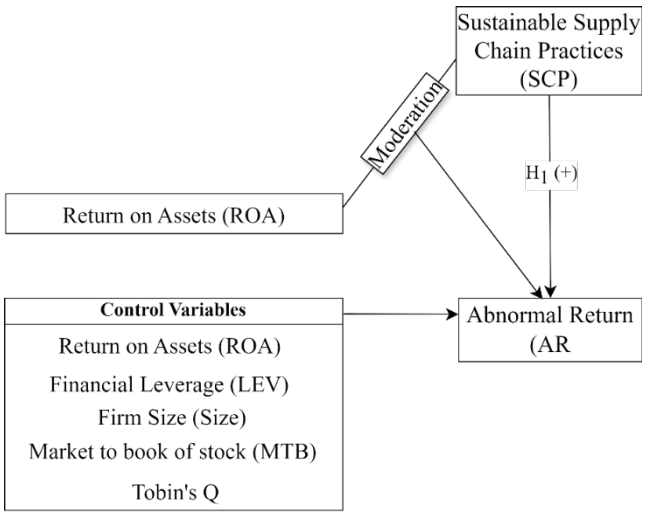
Financial leverage (LEV) represented the debt-to-equity ratio of a company. Wu (2023) addressed a negative effect of financial leverage on the stock's profitability of the companies. Conversely, Akbar & Herianingrum (2015), Fitri & Herlambang (2016) found that a higher financial leverage ratio might create an increase in the stock abnormal returns of a company. Consistence with those arguments, this current study hypothesized that the financial leverage was considered as a tool to enhance the profitability if the companies can figure out an appropriate strategy to utilize the using of financial assets. Therefore, the increase in the ratio of financial leverage is expected to have a positive impact on the stock abnormal returns of company.

In this study, company size is described by the total assets of the company, consistent with the previous study of Bhat et al. (2023). An increase in the value of assets might help to increase the competitive advantages of the companies and enhance the contribution of relationship with the stakeholders. Especially, during the crisis period, Mayuni & Suarjaya (2018) have indicated that the investors prefer to invest to a larger company, suggesting that the stock price of the larger companies might increase, or at least might be stable (Acheampong et al., 2014; Arslan et al., 2014).

Market-to-Book Ratio (MTB) is a ratio used to measure the market value performance of a stock compared to its book value (Brigham & Houston, 2013). Typically, the market value of stocks tends to be higher than their book value. Studies have shown that a higher MTB value will have a positive impact on the abnormal

returns of company stocks (Fitri & Herlambang, 2016; Akbar & Herianingrum, 2015). Tobin's Q ratio is calculated as the market value of a company divided by total book value of a company (Tobin, 1969). A Tobin's Q ratio with the value between 0 and 1 means that the cost to replace a firm's assets is larger than the value of its stock. In contrast, a Tobin'Q with a value larger than 1 implies that a companies' stock is more expensive than the replacement costs of its assets (Alghifari et al., 2013). For investors, the Tobin's Q ratio is crucial in making their investment decisions. A high value of Tobin's Q ratio, thus, might reflect to the stock abnormal return of a company since the investors might expect more profitability of those companies' stock (Fama & French, 1992).

The theoretical framework and proposed research model of the effects of implementing sustainable supply chain on stock abnormal returns of companies listed on the Vietnamese stock market are represented in Figure 1.



Source: Summarized based on the related theories and previous scholars

Figure 1. The research models of the effects of implementing sustainable supply chain on stock abnormal returns of companies listed on the Vietnamese stock market.

Methodology

Data collection

This study explored the sampling includes quarterly panel data 63 companies which belonged to lists of VN100 companies listed on the Vietnamese stock market. Of those, the companies included in the sampling must be presented in all the lists of VN100 companies from January 2020 to March 2023. This is because the list of VN100 companies is changed every year based on the annual reassessment results and announcement, conducted by the Ho Chi Minh Stock Exchange (HOSE), Vietnam. Among those, the treatment group included 10 companies that have implemented sustainable strategies in their supply chain. The control group included 53 companies that have not implemented sustainable strategies in their supply chain yet.

The data collection was divided into two phases of analysis to achieve the study's purposes that aim to examine the effects of implementation of sustainable strategies in the supply chain on stock abnormal returns in the context of COVID-19 pandemic. Accordingly, the 1st phase was defined from January 1, 2020,

to December 31, 2021, which was identified as the COVID-19 outbreak was seriously going on. The 2nd phase was presented from January 1, 2022, to March 31, 2023 was indicated as the COVID-19 pandemic was under control, and various policies have been forced to recover the Vietnam's economy. Accordingly, the first case of COVID-19 occurs in the end of January and early February in 2020. As already described in introduction section, the existences of COVID-19 pandemic have resulted of the seriously negative effects on the Vietnamese stock markets during 2020 to end of 2021. However, the Vietnam Government started to issue various incentives policies to enhance the recovery of economy from January 2022 under the perspectives of "New Normal Situation" (Thuy et al., 2022). Accordingly, Vietnam Government require the commercial banks for the carrying out of the low-interest loans programs, and facilitate to ensure the accessibility those loans of the producers and companies to maintain and recover the operation and business activities (Huyen, 2021). Government also implemented the reduction of tax rate for companies and consumers with the efforts to stabilize the consumer price index and share the negative impacts of COVID-19 with the companies and Vietnamese's people. By those policies, the economy of Vietnam has been equivalently recovered in the end of the 1st Quarter 2023 (until March 2023) with the increase of 6.79 % of GDP, compared to 6.85% of GDP has been reached in the 4th Quarter of 2019, which was the last quarter before the occurs of COVID-19 pandemic in Vietnam.

To obtain the abnormal returns data, the daily data of stocks price from January 1, 2020, to March 31, 2023. were first obtained from the official financial statement reports and the information public on Vietstock-Finance portal. The daily abnormal returns (AR), then, were averagely calculated to quarterly data based on the daily stocks price of companies (see the details in Appendix 1). Hence, the total number of daily stocks price of 63 companies obtained from January 2020 to March 31, 2023 was 51,093 observations, and was converted to 819 quarterly observations. The quarterly data of the control variables including return on assets (ROA), financial leverage (LEV), total assets (Size), market-to-book ratio (MTB), and Tobin's Q ratio of the companies was collected from the official financial statements of the companies.

Data analysis

Regression models, which were appropriate for panel data, including Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects Model (FEM), and Random Effects Model (REM) were explored to estimate the effects of implementing sustainable strategies in the supply chain on the stock abnormal returns of companies in the sampling. F-test and Breusch-Pagan Lagrange test were applied to examine the goodness of fit of the models. The empirical model was presented as follows:

$$AR_{it}=\beta_0+\beta_{1it}SSCM_{it}+\beta_{2it}ROA_{it}+\beta_{3it}LEV_{it}+\beta_{4it}Size_{it}+\beta_{5it}TobinQ_{it}+\beta_{6it}MTB_{it}+\beta_{7it}SSCM*ROA+\varepsilon_{it} \quad \textbf{(Equation 1)}$$

where,

AR_{it} is the dependent variable, indicated the stock abnormal return of i^{th} (i=1, 63) company at t (t=1, 13) quarter from January 2020 to March 2023. In this study, the stock abnormal returns is measured based on the market model as suggested by Fama et al. (1969); MacKinlay (1997). Accordingly, daily abnormal returns are the difference between the actual returns and the expected returns of stocks. The detailed procedures to determine the stock abnormal returns are presented in Appendix 1.

β_0: intercept of the regression models

β_1, …, β_7: indicates the coefficients of the factors influencing to stock abnormal returns.

ε: represents the error term.

The descriptions of variables included in the regression models are presented in Table 1.

Table 1: Description of variables used in the Pooled OLS, FEM, and REM Regression Models

Variables	Descriptions	Sources
Dependent variable		
AR	Daily abnormal returns. The data is calculated from the daily stock prices collected for 63 companies from 01/01/2020 to 31/03/2023, consisting of 51,093 observations (equivalent 819 quarterly observations)	Albuquerque et al., 2020 Fasan et al., 2021
Independent variables		
SSCM	Equals to 1 for indicating the company implements sustainable supply chain management strategies, and equals to 0 for indicating the company has not implemented SSCM	Albuquerque et al., 2020 Fasan et al., 2021
Control variables		
ROA	Return on assets ratio	Stefano, 2015; Anwaar, 2016; Mayuni & Suarjaya, 2018
LEV	Total debt/Total assets	Fitri & Herlambang, 2016; Akbar & Heraningrum, 2015
Size	The logarithm of the total assets of the company	Acheampong et al., 2014; Arslan et al., 2014
Tobin's Q	The market value of a company divided by total book value of a company	Alghifari et al., 2013
MTB	The market-to-book ratio (market value/book value) of the company	Fitri & Herlambang, 2016; Akbar & Heraningrum, 2015
Moderator		
SSCM*ROA	The interaction of implements sustainable supply chain management strategies and return on assets ratio	He & Harris, 2020; Carter & Dresner, 2001;

Source: Summarized based on the related theories and previous scholars

Results and Discussion

The estimated results of implementing sustainable strategies in the supply chain on the stock abnormal returns of companies included in the sampling are shown in Table 2.

Table 2: The estimated results of the Pooled OLS, FEM, and REM Regression Models of the effects of the implementing sustainable supply chain strategies on the stock abnormal returns of companies listed on the Vietnamese stock market

	1st Phase (from 01/01/2020 to 31/12/2021)						2nd Phase (from 01/01/2022 to 31/03/2023)					
Variables	**Pooled OLS**		**FEM**		**REM**		**Pooled OLS**		**FEM**		**REM**	
	Coefficients	**t**	**Coefficients**	**t**	**Coefficients**	**z**	**Coefficients**	**t**	**Coefficients**	**t**	**Coefficients**	**z**
SSCM	0.0010*	1.67	-	-	0.0010*	1.67	-0.0003	-0.66	-	-	-0.0003	-0.66
ROA	0.0001^{ns}	1.25	0.0002^{ns}	1.11	0.0001^{ns}	1.25	0.0001	1.03	0.0001	0.93	0.0001	1.03
TobinQ	-0.0012**	-2.53	0.0006^{ns}	0.57	-0.0012**	-2.53	0.0007***	2.77	0.0001***	-0.15	0.0001***	-0.24
MTB	0.0008***	2.98	0.0015**	2.47	0.0008***	2.98	0.0000	-0.24	0.0014	2.67	0.0007	2.77
LEV	0.0001^{ns}	0.80	0.0003	0.56	0.0001	0.80	0.0001**	2.33	0.0003	0.82	0.0001**	2.33
SIZE	-0.0009**	-2.32	-0.0061**	-2.01	-0.0009**	-2.32	0.0000	0.01	-0.0031	-0.84	0.0000	0.01
SSCM*ROA	-0.0002	-0.78	0.0001^{ns}	0.06	-0.0002	-0.78	0.0000	-0.14	0.0002	0.59	0.0000	-0.14
Constant	0.0119**	2.42	0.0775*	1.94	0.0119**	2.42	-0.0020	-0.66	0.0384	0.77	-0.0020	-0.66
F – test		1.92*		6.78***				3.35***		2.82*		
Chi – square test					13.47**							23.46***
Number of Observation	504						315					

*Note: ***, **, *, ns denoted the significant level at 0.01, 0.05, 0.1, and insignificant, respectively.*

As can be seen in Table 3, the results of the F-test and the Breusch – Pagan Lagrange test indicate that the estimated results from the Random Effects model and the Pooled Ordinary Least Squares (OLS) regression model indicated a highest goodness of fit to analyze the effects of implementing sustainable supply chain strategies on the stock abnormal returns of the companies listed on the Vietnamese stocks market in the 1st and the 2nd phases ($P < 0.1$), respectively.

Table 3: Results of F-test and Breusch – Pagan Lagrange test to examine the goodness of fit of the regression models

Types of tests	**1st Phase (from 01/01/2020 to 31/12/2021)**	**2nd Phase (from 01/01/2022 to 31/03/2023)**
F – test	F (62, 436) = 1.07^{ns}	F(62, 436) = 0.98^{ns}
Breusch – Pagan Lagrange test	Chibar2(01) = 6.42**	Chibar2(01) = 0.30^{ns}

*Note: ***, **, *, ns denoted the significant level at 0.01, 0.05, 0.1, and insignificant, respectively.*

In addition, it was found that there were existences of heteroskedasticity and autocorrelation ($P < 0.05$). Therefore, the Feasible Generalized Least Squares (FGLS) regression model (see Table 4) was explored to figure out the effects of the implementing sustainable strategies in the supply chain and the control variables on the stock abnormal returns of the companies in the sampling ($P < 0.01$).

Table 4: Estimated results of FGLS regression model to estimate the impact of implementing sustainable strategies in the supply chain and the control variables on the stock abnormal returns of the companies in the sampling.

Variables	1st Phase (from 01/01/2020 to 31/12/2021)		2nd Phase (from 01/01/2022 to 31/03/2023)	
	Coefficients	Z	Coefficients	Z
SSCM	0.0013***	2.65	-0.0005^{ns}	-1.52
Return on Assets (ROA)	0.0003***	2.94	0.0001**	2.09
Tobin's Q	-0.0014***	-3.84	-0.0001^{ns}	-0.92
Market-to-book (MTB)	0.0008***	3.90	0.0007***	3.82
Financial leverage (LEV)	0.0001^{ns}	1.29	0.0002***	3.69
Firm size (SIZE)	-0.0009***	-2.92	0.0001^{ns}	0.05
SSCM*ROA	-0.0003*	-1.85	0.0001^{ns}	0.07
Constant	0.0115^{ns}	3.02	-0.0021^{ns}	-0.95
Wald chi2		29.8***		61.13***
Number of Observation	504		315	

*Note: ***, **, *, ns denoted the significant level at 0.01, 0.05, 0.1, and insignificant, respectively.*

Found results indicated that, during the 1st phase, the implementation of sustainable strategies has created a positive influence on the stock abnormal returns of the companies at 0.13 percentage points ($P < 0.01$). This means that implementing sustainable strategies in the supply chain helps to increase stocks price of Vietnamese companies listed on the stock market in the crisis with the evidence from the COVID-19 pandemic. The results are correspondent with the previous studies of Huang et al. (2012), Habib & Ilmudeen (2020), Quintana-García et al. (2021), Fasan et al. (2021), Abbas & Tong (2023). The implementation of the sustainable supply chain was found as the significant factor to increase the shareholder's confidences in the crisis. Therefore, the shareholders might be willing to invest more in those companies' stocks. Consequently, despite the context of crisis, the price of those stocks might still increase.

Besides that, the estimated results also indicated that the increase of return on assets ratio of companies might lead to an increase in the stock abnormal returns ($P < 0.05$). This finding consisted of the scholars of Acheampong et al. (2014); Arslan et al. (2014). Moreover, the estimated results indicated a mitigation effect of the interaction variable between return on assets ratio and the implementation of sustainable supply chain management strategies on the abnormal return in the stock price of companies ($P < 0.1$). These results suggested that the financial efficiency might become the important criteria for the shareholders to make the investment decision-making to the companies. Probably, a stable and high return on assets ratio and the implementation of sustainable supply chain management strategies of the companies might separately call for the trust from the shareholders under the crisis scenarios. The price of stock of those companies, then, might increase, and abnormal return would be increase as well. However, it could not confirm that the moderator role of implementation might enhance the effects of the financial efficiency on the abnormal return of the companies' stock price ($P < 0.1$) as the perspectives of resource-based review (Barney, 1991) and the theory of resource dependence (Pfeffer & Salancik, 1978, 2015).

Large-scale companies and án increase in Tobin's Q ratio have been significantly as factors creating decreases in the stock abnormal returns of the companies in the sampling ($P < 0.01$). This result does not correspond with the expected hypothesis, but consistent with the research results of Alghifari et al. (2013), Gavrilakis & Floros (2023). During the serious context of COVID-19 pandemic, which indicated a negative

impact on the global economy. Large scale companies with high market capitalization must face more challenges due to the more dependent on global partners. Consequently, the higher the costs incurred in operations and monitoring, which negatively affects business efficiency and stock prices of those companies (Zhang et al., 2020; Al-Awadhi et al., 2020). Furthermore, in times of crisis, larger-scale companies have a higher potential for the leadership to exploit company assets or fail to fulfill their responsibilities and roles, leading to increased agency costs and reduced business efficiency (King & Santor, 2008).

In contrast, in the 2nd phase, the results of the regression model estimation showed that when Vietnam had successfully controlled the COVID-19 pandemic and business activities had returned to a normal state, the effects of sustainable solutions in the supply chain management on abnormal returns in stock price of companies were not confirmed at the significant level 10%. On the other hand, other factors such as profitability, market to bool value, and financial leverage had a positive effect on the abnormal returns of listed company stocks in the research sample ($P < 0.05$). These findings are consistent with similar studies by Van Hoek (1999), Seuring (2001), Lin et al. (2020), suggesting that implementing sustainable solutions in the supply chain may have a positive impact on a company's abnormal returns during a crisis. However, the effectiveness of these solutions in the post-crisis stage is unclear because the business performance of the company is influenced by various factors, and the application of sustainable solutions may indirectly bring financial benefits to the company through related activities within the chain (Feng et al., 2018). Therefore, sustainable strategies in the supply chain management can help companies maintain stable operations and achieve economic benefits such as increased profitability, market share, and cost control, especially during a crisis, to maintain financial stability and have a positive impact on abnormal returns of company stocks. As a result, investors will have confidence and prioritize choosing stocks of companies with better sustainable solutions in a crisis context. The findings of this research suggested that implementing sustainable solutions in the supply chain can be an effective strategy that brings positive impacts to stabilize a company's operations and reduce stock price volatility during complex disease outbreaks.

However, the implementation of sustainable strategies in the supply chain have resulted of the negatively significant effects on the stock abnormal returns of companies listed on the Vietnamese stock market since the COVID-19 pandemic has been under controlled. This might be explained because the awareness of the environment and society issues was still limited in Vietnam and other similar emerging stock markets, the practical sustainable strategies related to environment and social aspects of the companies were forced as the priority alternatives to respond the requirements and pressures from the stakeholders in the supply chain due to the limitation of the internal resources (Barney, 1991; Lin et al., 2020). In the other words, this suggested that Vietnamese companies did not consider the sustainable supply chain management strategies as the critical tool to manage risks and uncertainties in the long-term resilience so that the sufficient resources to pursue those activities have not been allocated yet.

Notably, despite the companies played as the focal agent to contribute and enhance the sustainable strategies in the supply chain, the implementation process of those activities must involve the integration of all other agents among supply chain towards to meet the mandatory national laws and regulations pressured by stakeholders based on the perspectives of resource dependence theory and the stakeholder theory (Fasan et al., 2021). This might lead to the requirement of a stringent improvement and innovation in the operations of all stakeholders in the entire supply chain to extremely tackle the environment and society issues. Those, therefore, required additional financial resources for implementation of sustainable supply chain strategies.

Consequently, the companies might have to increase the price of their output products to compensate the additional costs, suggesting that they might have to face to reduce the competitive advantages due to the increase in the products price, and/or the decrease in quantity demand from their customers, especially in the context of negative effects of COVID-19 pandemic. This means that the companies and other stakeholders must carefully consider the trade-off of the economic incentives to implement the sustainable supply chain strategies (Guide & Srivastava, 1998; King & Lenox, 2002). As a result, companies tend to figure out the supply chain management strategies to create the adding value based on the current resources and strategies instead of calling for the others financial and non-financial resources to extend the investment for environmental and social issues. For example, companies might adopt the lean the production processes with a higher attention to environmental impacts, and/or enhance their suppliers for considering the environmental and social requirements.

Conclusion and Implications

The study was conducted based on empirical evidence from 63 companies listed on the Ho Chi Minh Stock Exchange, Vietnam, to examine whether the implementation of sustainable supply chain strategies effects on stock abnormal return in the context of uncertainties scenarios (i.e. COVID-19 pandemic). Found results showed the significant effects of implementing sustainable strategies in the supply chain on the stock abnormal returns of company listed on the Vietnamese stock market during the crisis ($P < 0.05$). However, the differences in the significant influences between the different phases of the crisis were addressed. The implementation of the sustainable supply chain management strategies might be useful to mitigate the negative impacts on volatility of stock prices in the crisis conditions, suggesting that companies with the better sustainable supply chain management strategies might have the higher tolerances probability in operation under the market risks and uncertainties. Hence, sustainable supply chain management strategies might help for responding to the customers' demands and the national laws and regulations related to environmental or social issues. Those, then, might enhance the competitive advantages, and reputation of the companies in the long term.

However, it was also concluded that the stock abnormal returns of the companies with the implementing sustainable supply chain tend to be less than that of the other companies listed on the Vietnamese stock market since the crisis has been well-controlled, suggesting that the sustainable strategies in the supply chain of the companies might not be a critical tool to fulfill the purposes of long-term resilience and sustainability development in the recent. Probably, those strategies currently aim to respond the requirements of customers, stakeholders, and shareholders through environment and social commitments, which might support to mitigate a heavy damage during the sudden uncertainties periods only. Therefore, the information of the implementing sustainable practices in the supply chain management strategies of the companies has not been disclosed sufficiently. Consequently, the shareholders might lack awareness and consideration of the importance of sustainable practices in the supply chain during the investment decision-making process, suggesting that the information of implementation of sustainable practices in the supply chain should be carefully presented in the official business statements of the companies.

Nevertheless, it should be noticed that profitability plays as the most crucial factor reflecting a company's financial performance. It is the core value that the managers and shareholders pay attention to in the decision making for business operation and investment as well. Therefore, the spending of additional costs, align with the requirements of integration and collaboration of among agents in the supply chain to carry out the

alternatives of environment and social welfare, were estimated as the largest barriers for companies to apply the sustainable supply chain management strategies of the companies in Vietnam and the other countries, where the important role of sustainability development in the supply chain have not been generalized approached yet. Those results suggested that the benefits sharing mechanism should be carefully considered to ensure the economics incentives and call for the willingness to collaboration of all agents in the supply chain. The results of this study, thus, are expected to contribute scientific platforms on procedures for enhancing the sustainability in the supply chain of the companies listed on the Vietnamese stock market and other emerging stock markets in the world to carry out the sustainable risk management strategies and increase the reaction ability to the risks and uncertainties conditions.

Conflicts of interested: The authors declare there is no of interested.

Acknowledgement: We would like to thank for the critical comments and recommendations from the anonymous reviewers for improving our manuscript. The authors would like to thank Assoc.Prof.Dr. Khong Tien Dung (Advanced Senior Lecturer of School of Economics, Can Tho University) for the English editing a draft of this manuscript.

Authors contribution:

1. Nguyen Thi Ngoc Hoa: *Conceptualization, Data curation, Investigation, Methodology, Writing – original draft, Writing – review & editing*

2. Khuu Thi Phuong Dong: *Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing, Supervision*

3. Nguyen Quoc Hung: *Data curation, Investigation, Writing – original draft*

4. Nguyen Minh Canh: *Data curation, Investigation, Writing – original draft, Writing – review & editing*

References

Abbas, H.; Tong, S. (2023). Green Supply Chain Management Practices of Firms with Competitive Strategic Alliances - A Study of the Automobile Industry. Sustainability, Vol. 15, No. 3, 2156. https://doi.org/10.3390/su15032156

Acheampong, P.; Agalega, E.; Shibu, A. K. (2014). The effect of financial leverage and market size on stock returns on the Ghana Stock Exchange: evidence from selected stocks in the manufacturing sector. International Journal of Financial Research, Vol. 5, No. 1, pp.125-134. https://doi.org/10.5430/ijfr.v5n1p125

Ahmed, W.; Sarkar, B. (2018). Impact of carbon emissions in a sustainable supply chain management for a second generation biofuel. Journal of Cleaner Production, Vol. 186, pp. 807-820. https://doi.org/10.1016/j.jclepro.2018.02.289

Akbar, R.; Herianingrum, S. (2015). Pengaruh price earning ratio (PER), price book value (PBV) dan debt to equity ratio (DER) terhadap return saham (studi terhadap perusahaan properti dan real estate yang listing di indeks saham syariah indonesia). Jurnal Ekonomi Syariah Teori & Terapan, Vol. 2, No. 9, pp. 698-713.

Al-Awadhi, A. M.; Alsaifi, K.; Al-Awadhi, A.; Alhammadi, S. (2020). Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. Journal of Behavioral and Experimental Finance, Vol. 27, 100326. https://doi.org/10.1016/j.jbef.2020.100326

Albuquerque, R.; Koskinen, Y.; Yang, S.; Zhang, C. (2020). Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. The Review of Corporate Finance Studies, Vol. 9, No. 3, pp. 593-621. https://doi.org/10.1093/rcfs/cfaa011

Alghifari, E. S.; Triharjono, S.; Juhaeni, Y. S. (2013). Effect of return on assets (ROA) against Tobin's q: Studies in food and beverage company in Indonesia stock exchange years 2007-2011. International Journal of Science and Research (IJSR), Vol. 2, No. 1, 722-725.

Anwaar, M. (2016). Impact of Firms' Performance on Stock Returns (Evidence from Listed Companies of FTSE-100 Index London, UK). Aufbereitungs-Technik, Vol. 30, No. 11, pp. 678–685.

Arslan, M.; Zaman, R.; Phil, M. (2014). Impact of dividend yield and price earnings ratio on stock returns: A study non-financial listed firms of Pakistan. Research Journal of Finance and Accounting, Vol. 5, No. 19, pp. 68-74.

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of management, Vol. 17, No. 1, pp. 99-120. https://doi.org/10.1177/014920639101700108

Bhat, D. A.; Chanda, U.; Bhat, A. K. (2023). Does firm size influence leverage? Evidence from India. Global Business Review, Vol. 24, No. 1, pp. 21-30. https://doi.org/10.1177/0972150919891616

Brigham, E. F.; Houston, J. F. (2013). Fundamentals of financial management. South-Western Cengage Learning.

Bu, X., Dang, W. V., Wang, J., & Liu, Q. (2020). Environmental orientation, green supply chain management, and firm performance: empirical evidence from Chinese small and medium-sized enterprises. International journal of environmental research and public health, 17(4), 1199. https://doi.org/10.3390/ijerph17041199

Burritt, R. L.; Schaltegger, S.; Bennett, M.; Pohjola, T.; Csutora, M. (2011). Sustainable Supply Chain Management and Environmental Management Accounting (pp. 3-20). Springer Netherlands. https://doi.org/10.1007/978-94-007-1390-1_1

Carroll, A. B. (1979). A three-dimensional conceptual model of corporate performance. Academy of Management Review, 4(4), 497–505. https://doi.org/10.5465/amr.1979.4498296

Carter, C. R., & Dresner, M. (2001). Purchasing's role in environmental management: cross-functional development of grounded theory. Journal of Supply Chain Management, 37(2), 12–27. https://doi.org/10.1111/j.1745-493X.2001.tb00102.x

Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: moving toward new theory. International Journal of Physical Distribution & Logistics Management, 38(5), 360–387. https://doi.org/10.1108/09600030810882816

Chandler, A. D. (1962). Strategy and structure: Chapters in the history of the industrial empire. Cambridge Mass, 5(1), 12–48.

Che-Ngoc, H.; Do-Thi, N.; Nguyen-Trang, T. (2023). Profitability of Ichimoku-based trading rule in Vietnam stock market in the context of the COVID-19 outbreak. Computational Economics, Vol. 62, No. 4, pp. 1781-1799. https://doi.org/10.1007/s10614-022-10319-6

Clarkson, M. E. (1995). A stakeholder framework for analyzing and evaluating corporate social performance. Academy of Management Review, 20(1), 92–117. https://doi.org/10.5465/amr.1995.9503271994

Dang Ngoc, H.; Vu Thi Thuy, V.; Le Van, C. (2021). Covid 19 pandemic and Abnormal Stock Returns of listed companies in Vietnam. Cogent Business & Management, Vol. 8, No. 1, 1941587. https://doi.org/10.1080/23311975.2021.1941587

Danso, A.; Adomako, S.; Amankwah-Amoah, J.; Owusu-Agyei, S.; Konadu, R. (2019). Environmental sustainability orientation, competitive strategy and financial performance. Business Strategy and the Environment, Vol. 28, No. 5, pp. 885-895. https://doi.org/10.1002/bse.2291

Do, A.; Nguyen, Q.; Nguyen, D.; Le, Q.; Trinh, D. (2020). Green supply chain management practices and destination image: Evidence from Vietnam tourism industry. Uncertain Supply Chain Management, Vol. 8, No. 2, pp. 371-378. https://doi.org/10.5267/j.uscm.2019.11.003

Durugbo, C.; Amankwah-Amoah, J. (2019). Global sustainability under uncertainty: How do multinationals craft regulatory policies?. Corporate Social Responsibility and Environmental Management, Vol. 26, No. 6, pp. 1500-1516. https://doi.org/10.1002/csr.1764

Dzikriansyah, M. A.; Masudin, I.; Zulfikarijah, F.; Jihadi, M.; Jatmiko, R. D. (2023). The role of green supply chain management practices on environmental performance: A case of Indonesian small and medium enterprises. Cleaner Logistics and Supply Chain, Vol. 6, 100100. https://doi.org/10.1016/j.clscn.2023.100100

Eesley, C., & Lenox, M. J. (2006). Firm responses to secondary stakeholder action. Strategic Management Journal, 27(8), 765–781. https://doi.org/10.1002/smj.536

Fama, E. F.; French, K. R. (1992). The cross-section of expected stock returns. The Journal of Finance, 47(2), 427-465.

Fama, E. F.; Fisher, L.; Jensen, M. C.; Roll, R. (1969). The Adjustment of Stock Prices to New Information. International Economic Review, Vol. 10, No.1, pp. 1-21. https://doi.org/10.2307/2525569

Fasan, M.; Soerger Zaro, E.; Soerger Zaro, C.; Porco, B.; Tiscini, R. (2021). An empirical analysis: Did green supply chain management alleviate the effects of COVID-19?. Business Strategy and the Environment, Vol. 30, No. 5, pp. 2702-2712. https://doi.org/10.1002/bse.2772

Feng, M.; Yu, W.; Wang, X.; Wong, C. Y.; Xu, M.; Xiao, Z. (2018). Green supply chain management and financial performance: The mediating roles of operational and environmental performance. Business strategy and the Environment, Vol. 27, No. 7, pp. 811-824. https://doi.org/10.1002/bse.2033

Fitri, N. E.; Herlambang, L. (2016). Pengaruh Rasio Profitabilitas, Rasio Solvabilitas, Dan Rasio Likuiditas Terhadap Return Saham Perusahaan Properti Dan Real Estate Yang Terdaftar Dalam Indeks Saham Syariah Indonesia (ISSI) Periode 2011–2014. Jurnal Ekonomi Syariah Teori dan Terapan, Vol. 3, No. 8, 315054.

Freeman, R. E. (1984). Strategic Management: A Stakeholder Approach. Pitman Publishing Inc.

Freeman, R. E. (2010). Strategic management: A stakeholder approach. Cambridge University Press.

Gavrilakis, N.; Floros, C. (2023). ESG performance, herding behavior and stock market returns: evidence from Europe. Operational Research, Vol. 23, No. 1, 3. https://doi.org/10.1007/s12351-023-00745-1

Golicic, S. L.; Smith, C. D. (2013). A meta-analysis of environmentally sustainable supply chain management practices and firm performance. Journal of supply chain management, Vol. 49, No. 2, pp. 78-95. https://doi.org/10.1111/jscm.12006

Guide Jr, V. D. R.; Srivastava, R. (1998). Inventory buffers in recoverable manufacturing. Journal of operations management, Vol. 16, No. 5, pp. 551-568. https://doi.org/10.1016/S0272-6963(97)00024-7

Habib, M. A.; Bao, Y.; Ilmudeen, A. (2020). The impact of green entrepreneurial orientation, market orientation and green supply chain management practices on sustainable firm performance. Cogent Business & Management, Vol. 7, No.1, 1743616. https://doi.org/10.1080/23311975.2020.1743616

He, H.; Harris, L. (2020). The impact of Covid-19 pandemic on corporate social responsibility and marketing philosophy. Journal of Business Research, Vol. 116, pp. 176–182. https://doi.org/10.1016/j.jbusres.2020.05.030

Hoang, T., Przychodzen, W., Przychodzen, J., & Segbotangni, E. A. (2020). Does it pay to be green? A disaggregated analysis of US firms with green patents. Business Strategy and the Environment, 29(3), 1331–1361. https://doi.org/10.1002/bse.2437

HSX, 2019. HOSE: VNSI-Vietnam Sustainability Index. <https://www.hsx.vn/Modules/Cms/Web/ViewArticle/cdce1434-f229-48d3-b714-a28ec99c048d> [Lastest accessed: January 20, 2024]

Huang, Y. C.; Jim Wu, Y. C.; Rahman, S. (2012). The task environment, resource commitment and reverse logistics performance: evidence from the Taiwanese high-tech sector. Production Planning & Control, Vol. 23, No. 10-11, pp. 851-863. https://doi.org/10.1080/09537287.2011.642189

Hung, D. V.; Hue, N. T. M.; Duong, V. T. (2021). The impact of COVID-19 on stock market returns in Vietnam. Journal of Risk and Financial Management, Vol. 14, No. 9, 441. https://doi.org/10.3390/jrfm14090441

Huyen, N. T. T. (2021). Report on the Vietnamese Socio-Economic in the 4th Quarter and Year 2021 [in Vietnamese]. General Statistics Office [Online]. https://www.gso.gov.vn/du-lieu-va-so-lieu-thong-ke/2021/12/bao-cao-tinhhinh-kinh-te-xa-hoi-quy-iv-va-nam-2021. [Date accessed: 06/09/2023].

Khodoomi, M.R.; Seif, M.; Hanne, T. (2023). Effects and challenges of the COVID-19 pandemic in supply chain management: a text analytics approach. Supply Chain Forum: An International Journal, (in press). https://doi.org/10.1080/16258312.2023.2253523

Kim, E. (2018). Green supply chain management in organic agriculture sector: A case study in Vietnam food safety management. In Proceedings to the 13th International Congress on Logistics and SCM Systems (ICLS 2018) (pp. 506-513). International University-National University of Ho Chi Minh City.

King, A.; Lenox, M. (2002). Exploring the locus of profitable pollution reduction. Management science, Vol. 48, No. 2, pp. 289-299. https://doi.org/10.1287/mnsc.48.2.289.258

King, M. R.; Santor, E. (2008). Family values: Ownership structure, performance and capital structure of Canadian firms. Journal of Banking & Finance, Vol. 32, No. 11, pp. 2423-2432. https://doi.org/10.1016/j.jbankfin.2008.02.002

Klassen, R. D.; Whybark, D. C. (1999). Environmental management in operations: the selection of environmental technologies. Decision sciences, Vol. 30, No. 3, pp. 601-631. https://doi.org/10.1111/j.1540-5915.1999.tb00900.x

Kroes, J. R., & Ghosh, S. (2010). Outsourcing congruence with competitive priorities: Impact on supply chain and firm performance. Journal of Operations Management, 28(2), 124–143. https://doi.org/10.1016/j.jom.2009.09.004

Le, T. T. (2020). The effect of green supply chain management practices on sustainability performance in Vietnamese construction materials manufacturing enterprises. Uncertain Supply Chain Management, Vol. 8, No. 1, pp. 43-54. https://doi.org/10.5267/j.uscm.2019.8.007

Lin, C. Y.; Alam, S. S.; Ho, Y. H.; Al-Shaikh, M. E.; Sultan, P. (2020). Adoption of green supply chain management among SMEs in Malaysia. Sustainability, Vol. 12, No. 16, 6454. https://doi.org/10.3390/su12166454

MacKinlay, A. C. (1997). Event studies in economics and finance. Journal of economic literature, Vol. 35, No. 1, pp. 13-39.

Mayuni, I. A. I.; Suarjaya, G. (2018). Pengaruh ROA, FIRM SIZE, EPS, dan PER terhadap return saham pada sektor Manufaktur di BEI. E-Jurnal Manajemen Unud, Vol. 7, No. 8, pp. 4063–4093.

Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. Journal of Business Logistics, 22(2), 1–25. https://doi.org/10.1002/j.2158-1592.2001.tb00001.x

Meyer, J. W.; Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. American journal of sociology, Vol. 83, No. 2, pp. 340-363.

Mio, C.; Fasan, M. (2012). Does corporate social performance yield any tangible financial benefit during a crisis? An event study of Lehman brothers' bankruptcy. Corporate reputation review, Vol. 15, pp. 263-284. https://doi.org/10.1057/crr.2012.16

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. Academy of Management Review, 22(4), 853–886. https://doi.org/10.5465/amr.1997.9711022105

Nguyen, Y. V. B.; Vo, A. H. K. (2023). Herding behavior before and after COVID-19 pandemic: evidence from the Vietnam stock market. Journal of Economic Studies. https://doi.org/10.1108/JES-01-2023-0031

Pagell, M., & Wu, Z. (2009). Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars. Journal of Supply Chain Management, 45(2), 37–56. https://doi.org/10.1111/j.1745-493X.2009.03162.xPfeffer, J., & Salancik, G. (2015). External control of organizations—Resource dependence perspective. In Organizational behavior 2 (pp. 355–370). Routledge.

Pfeffer, J., & Salancik, G. R. (1978). The external control. New York.

Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. International Library of Critical Writings in Economics, 163, 210–222.

Qiu, S. C.; Jiang, J.; Liu, X.; Chen, M. H.; Yuan, X. (2021). Can corporate social responsibility protect firm value during the COVID-19 pandemic?. International Journal of Hospitality Management, Vol. 93, 102759. https://doi.org/10.1016/j.ijhm.2020.102759

Quintana-García, C.; Benavides-Chicón, C. G.; Marchante-Lara, M. (2021). Does a green supply chain improve corporate reputation? Empirical evidence from European manufacturing sectors. Industrial Marketing Management, Vol. 92, pp. 344-353. https://doi.org/10.1016/j.indmarman.2019.12.011

Rajesh, R. (2019). A fuzzy approach to analyzing the level of resilience in manufacturing supply chains. Sustainable Production and Consumption, Vol. 18, pp. 224-236. https://doi.org/10.1016/j.spc.2019.02.005

Rao, P.; Holt, D. (2005). Do green supply chains lead to competitiveness and economic performance?. International journal of operations & production management, Vol. 25, No. 9, pp. 898-916. https://doi.org/10.1108/01443570510613956

Seuring, S. A. (2001). Green supply chain costing: joint cost management in the polyester linings supply chain. Greener Management International, Vol. 33, pp. 71-80.

Seuring, S.; Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. Journal of cleaner production, Vol. 16, No. 15, pp. 1699-1710. https://doi.org/10.1016/j.jclepro.2008.04.020

Singh, B.; Dhall, R.; Narang, S.; Rawat, S. (2020). The outbreak of COVID-19 and stock market responses: An event study and panel data analysis for G-20 countries. Global Business Review, 0972150920957274. https://doi.org/10.1177/0972150920957274

Stefano, K. (2015). The Impact of Financial Ratio toward Stock Return of Property Industry in Indonesia. IBuss Management, Vol. 3, No. 2.

Thuink, R. (2023). Impact of Earnings Operations on Stock Prices. Journal of Internet Banking and Commerce, Vol. 28, No.2.

Thuy, T. M., Thu, N. P., Thuy, H. B., Thuong, N. T., & Thu, P. M. (2022). Unemployment Rises Sharply Due to the Impact of Covid-19 [in Vietnamese]. OSF Preprints hfw78, Center for Open Science. https://doi.org/10.31219/osf.io/hfw78

Toan, L. B., & Trinh, B. V. (2018). Sustainability and competitive advantages of the agricultural supply chain [in Vietnamese]. CTU Journal of Science, 54(9), 133–148. https://doi.org/10.22144/ctu.jvn.2018.190

Tobin, J. (1969). A general equilibrium approach to monetary theory. Journal of Money, Credit and Banking, Vol. 1, No.1, pp. 15-29. https://doi.org/10.2307/1991374

Van Hoek, R. I. (1999). From reversed logistics to green supply chains. Supply Chain Management: An International Journal, Vol. 4, No. 3, pp. 129-135. https://doi.org/10.1108/13598549910279576

Walley, N., & Whitehead, B. (1994). It's not easy being green. Reader in Business and the Environment, 36(81), 4.

Wernerfelt, B., & Karnani, A. (1987). Competitive strategy under uncertainty. Strategic Management Journal, 8(2), 187–194. https://doi.org/10.1002/smj.4250080209

Wittstruck, D., & Teuteberg, F. (2012). Understanding the success factors of sustainable supply chain management: empirical evidence from the electrics and electronics industry. Corporate Social Responsibility and Environmental Management, 19(3), 141–158. https://doi.org/10.1002/csr.261

Wu, H. (2023). Can Leverage Level Explain Value Premium: Based on China's A-share market. Frontiers in Business, Economics and Management, Vol. 8, No. 1, pp. 281-285. https://doi.org/10.54097/fbem.v8i1.6231

Yang, M. G. (2013). Developing a focal firm's sustainable supply chain framework: Drivers, orientation, practices and performance outcomes. The University of Toledo.

Zhang, D.; Hu, M.; Ji, Q. (2020). Financial markets under the global pandemic of COVID-19. Finance Research Letters, Vol. 36, 101528. https://doi.org/10.1016/j.frl.2020.101528

Zsidisin, G. A., Melnyk, S. A., & Ragatz, G. L. (2005). An institutional theory perspective of business continuity planning for purchasing and supply management. International Journal of Production Research, 43(16), 3401–3420. https://doi.org/10.1080/00207540500095613

APPENDIX

Steps of calculation the abnormal returns of stock i^{th} on day t^{th}, suggested by MacKinlay (1997) are presented as follow:

- Step 1: Estimate the effects of the return rate of market on day t^{th} to the return rate of stock i^{th} on day t^{th}. The basic regression model is as follows:

$$R_{it}=\alpha_i+\beta_i R_{mt}+u_{it} \quad \text{(Equation 2)}$$

where,

R_{it}: the rate of return of stock i^{th}, determined by the formula (Equation 3)

$$R_{it}=\ln\frac{P_{i,t}}{P_{i,t-1}} \quad \textbf{(}\text{Equation 3}\textbf{)}$$

$P_{i,t}$ and $P_{i,t-1}$ are the prices of stock i^{th} on day t^{th} and day t^{th}-1, respectively.

R_{mt}: return rate of market, determined by the formula (Equation 4):

$$R_{mt}=\ln\frac{VNIndex_t}{VNIndex_{t-1}} \textbf{(}\text{Equation 4}\textbf{)}$$

$VNIndex_t$ and $VNIndex_{t-1}$ are Vietnamese stock market index on day t^{th} and day t^{th}-1, respectively.

α_i: Intercept

β_i: coefficient, representing the effects of return rate of market on day t^{th} to the return rate of stock i^{th} on day t^{th}.

- Step 2: investigate the abnormal return of i^{th} based on the transformed function as presented in Equation 5.

$$u_{it}= AR_{it}=R_{it}-\left(\widehat{\alpha_l}+\widehat{\beta_l}R_{mt}\right) \quad \textbf{(}\text{Equation 5}\textbf{)}$$

where

u_{it}: Abnormal return of stock stock i^{th} on day t^{th}, representing the difference between the actual return and the expected return when considering α as the average return of companies holding during stable market movements, and β indicates the performance of the stock relative to the market (Mio & Fasan, 2012). In other words,

$\widehat{\alpha_l}$, $\widehat{\beta_l}$: are the estimated coefficients of α and β using the Ordinary Least Squares (OLS) method in Equation 2.