Journal of
Risk and Financial Management

MDPI

Article

Implementation of Sustainability Strategies in Operations and Abnormal Stock Returns Under Uncertainty: Evidence from Companies Listed on the Vietnamese Stock Market During the COVID-19 Outbreak

Nguyen Thi Ngoc Hoa, Khuu Thi Phuong Dong *, Nguyen Kim Khanh and Nguyen Minh Canh

School of Economics, Can Tho University, Can Tho City 900000, Vietnam; ntnhoa@ctu.edu.vn (N.T.N.H.); nkkhanh20900@gmail.com (N.K.K.); nmcanh@ctu.edu.vn (N.M.C.)
* Correspondence: ktpdong@ctu.edu.vn

Abstract: This study examines the effects of implementing sustainable strategies in operations on the abnormal stock returns of companies listed on the Vietnamese stock market under uncertain conditions, using an event study and difference-in-differences analysis. Daily trading data were obtained from 107 companies listed on the Vietnamese stock market from 2 January 2020 to 31 March 2020 (~6313 observations included in the sampling). Of these, 41/107 (38.3%) and 66/107 (61.7%) did and did not implement sustainability strategies in their operations, respectively. The feasible generalized least-squares regression model indicated a positive impact of the implementation of sustainable strategies in operations on abnormal stock returns of the companies during the COVID-19 pandemic ($p < 0.01$ in the context of the COVID-19 pandemic). The results underline the implementation of sustainability strategies in the operations of companies as a critical tool to mitigate damage under uncertain conditions, enhance resilience, and achieve long-term competitive advantages.

Keywords: sustainable practices; abnormal return; uncertainty; difference-in-differences analysis; Vietnamese stock market

check for updates

Academic Editor: Thanasis Stengos

Received: 3 January 2025
Revised: 3 March 2025
Accepted: 7 March 2025
Published: 10 March 2025

Citation: Hoa, N. T. N., Dong, K. T. P., Khanh, N. K., & Canh, N. M. (2025). Implementation of Sustainability Strategies in Operations and Abnormal Stock Returns Under Uncertainty: Evidence from Companies Listed on the Vietnamese Stock Market During the COVID-19 Outbreak. *Journal of Risk and Financial Management*, *18*(3), 146. https://doi.org/10.3390/jrfm18030146

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Sustainable development has become a priority and a significant goal of organizations and companies worldwide, with the integration of sustainability concerns into business strategy and operations (Burritt et al., 2011). Sustainability strategies aim to respond to customer requirements and achieve economic performance, including market, operational, and financial efficiencies, without negative impacts on the environment and social welfare (Carter & Rogers, 2008; Pagell & Wu, 2009; Seuring & Müller, 2008). In the context of globalization, sustainability in the operation of companies significantly affects their ability to manage the complicated network of business relationships with stakeholders at each stage of the production and business chain, from raw materials to production, distribution, and final consumption (Majumdar et al., 2020; Gong et al., 2023; Saini et al., 2023; Savita et al., 2016).

Accordingly, to promote environmental sustainability, companies might employ operational strategies to mitigate negative impacts on the environment, such as reducing fuel emissions, using renewable materials, and improving production processes to optimize resource utilization at each stage of the company's supply chain (Nguyen & Le, 2020).

By implementing these initiatives, companies can eliminate the environmental impact of supply chain activities and respond to customer demands for eco-friendly products. Simultaneously, this enhances internal and external environmental management efficiency, reinforcing competitive advantage and operational efficiency (Chavez et al., 2016; Chiou et al., 2011; Fasan et al., 2021; de Oliveira et al., 2018; Green et al., 2012). Meanwhile, social sustainability in the operation of a company is described as a strategy for ensuring the fair treatment and well-being of employees and fulfilling commitments to environmental protection within society (Albuquerque et al., 2020; Fasan et al., 2021; Hoang et al., 2020; Rajesh, 2020). In 2019, the COVID-19 pandemic significantly affected social and economic aspects of the world (Hung et al., 2021). The implementation of social distancing in different countries was seen as a challenging disruption of global supply chains, causing economic stagnation and company bankruptcy. Therefore, sustainability in operations needs to be emphasized to enhance the stability, flexibility, and responsiveness of companies to uncertain conditions (i.e., the COVID-19 pandemic).

The COVID-19 pandemic had a negative impact on the global stock market in the first quarter of 2020 (Ahmar & Del Val, 2020; Al-Awadhi et al., 2020; Baker et al., 2020; Fu & Shen, 2021; He et al., 2020; Mazur et al., 2021; Zhang et al., 2020). Substantial declines in stock prices for companies listed on the US and Chinese markets were observed in March 2020 (Fu & Shen, 2021; Mazur et al., 2021). Yamini found a sudden drop in stock prices in the US, the UK, Germany, Canada, Japan, France, and Italy in the first quarter of 2020 because of the dramatic decrease in business performance (Yamini, 2020). Similar findings were reported for the Indonesian stock market in March 2020 (Herwany et al., 2021; Utomo & Hanggraeni, 2021). The emergence of the COVID-19 pandemic resulted in a sudden decline in the Vietnamese stock market from January 2020 to March 2020 (Anh & Gan, 2020). By 30 March 2020, the VN-Index had declined by 28% (~USD 37.4 billion in capitalization) compared to 31 December 2019 (Hung et al., 2021). Several studies highlight the negative impact of the COVID-19 pandemic on the stock market, particularly during the first quarter of 2020, based on event studies and difference-in-differences (DID) analyses (Dang Ngoc et al., 2021; Hung et al., 2021; Nguyen et al., 2021; Phuong, 2021; Truong et al., 2020; Vo et al., 2022).

Meanwhile, in the context of globalization, the role of sustainability in business operations and supply chains has been of great concern to companies and stakeholders, including investors and shareholders, even prior to the COVID-19 pandemic. The Principles for Responsible Investment (PRIs), launched by the United Nations in 2005, have been widely adopted and accepted by institutional investors worldwide (PRI, 2021). The PRI framework proposes the significant role of sustainable strategies in environmental, social, and economic factors in ensuring stability in investors' and shareholders' financial benefits under uncertain conditions. Therefore, they are useful tools for investors in investment decision-making (Dhasmana et al., 2023). From a company's perspective, implementing sustainability strategies might not directly correlate with financial performance since these strategies are focused on creating resources and operational efficiency, aiming at reducing harmful effects on the environment and social welfare of supply chain activities. These, therefore, might or might not translate into profitability and/or market shares (Feng et al., 2018; Laari et al., 2018). However, stringent commitments to a high level of implementing sustainable solutions have become key to accessing international markets because these are increasingly considered by stakeholders participating in the global supply chain, including governments, consumers, investors, and non-governmental organizations (Albuquerque et al., 2020; Hamdy et al., 2018; Hoang et al., 2020). Consequently, current investors tend to pay more consideration to sustainability strategy implementation levels in their investment strategies to achieve the internal management quality of companies and to identify the

potential of business opportunities in the long term and stability under the context of uncertain conditions (Rajesh, 2020). Therefore, implementing sustainable supply chain management strategies might be considered as the driver of increasing companies' value (Wilkerson, 2005; Liu et al., 2020).

From a scientific perspective, several studies have indicated that the implementation of sustainability strategies in the economic, environmental, and social aspects of US companies' operations might mitigate the negative impact of the COVID-19 pandemic on stock price volatility by employing both event window and difference-in-differences methodologies (Castro-Iragorri, 2019; Albuquerque et al., 2020; Fasan et al., 2021). Accordingly, the volatility of company stock prices is measured by abnormal returns quantified using MacKinlay's market model (MacKinlay, 1997). Abnormal stock returns represent the differences between the realized and expected return rates of a stock or investment portfolio based on market expectations during a given period (Godfrey et al., 2009; MacKinlay, 1997; Mio & Fasan, 2012). The results of these studies indicated that a high level of sustainability in economic, environmental, and social strategies in companies' operations might result in fewer negative impacts on the abnormal stock returns of companies during the COVID-19 outbreak. These findings suggest that the stock prices of companies implementing sustainability in their economic, environmental, and social strategies might undergo fewer negative shocks from uncertain conditions (i.e., the COVID-19 pandemic). In other words, the implementation of sustainability strategies in economic, environmental, and social sectors of operation might not only enhance the stabilization of the business performance of companies listed on the US stock market in the short term, but also potentially enable financial resources to be maintained in the long term.

Since July 2017, the Ho Chi Minh Stock Exchange (HOSE) has collaborated with the German International Cooperation Organization (GIZ) and the State Securities Commission to develop the Vietnam Sustainability Index (VNSI), relying on a combination of publicly available data and third-party evaluations to determine its constituents. Accordingly, the sustainability assessment criteria of the VNSI were developed based on the GRI Standards set forth by the Global Reporting Initiative (GRI), the OECD Corporate Governance Principles, and current security regulations in Vietnam. These evaluation criteria were developed in consultation with reputable financial organizations, particularly through programs supporting the development of green products and services in the fields of finance and banking.

The VNSI is calculated based on the market capitalization method, with adjustment for the free float of the 20 companies listed on the VN100, and indicates the highest sustainability development scores in environmental (E), social (S), and corporate governance (G). The VN100 Index is presented for the top 100 companies listed on the HOSE with the highest market capitalization, free float, and liquidity. Companies listed on the VN100 index, excluding those in primary business sectors such as weapons, defense systems, alcohol, tobacco, gambling, nuclear energy, and coal, are evaluated and filtered based on their sustainability development scores. Finally, the top 20 companies with the highest environmental, social, and governance scores are included in the official VNSI calculation. The next 10 companies with high ESG performance are included as contingency portfolios. The VNSI list is updated annually to include companies demonstrating significant commitment to sustainability practices and exclude those with lower ESG scores, ensuring its credibility and reliability for investors and shareholders, while promoting transparency, ethical business conduct, and sustainable growth within the Vietnamese stock market.

Worldwide, researchers have considered sustainability strategies in the economic, environmental, and social dimensions of company operations. However, few studies have examined these emerging concepts in the Vietnamese context (Ahmed et al., 2018;

Hörisch et al., 2014). Previous scholars have primarily focused on assessing the awareness of companies and their status regarding the implementation of sustainable strategies in operations (Le, 2020). Several studies have been conducted to evaluate the implementation of environmental sustainability strategies by economic sectors in Vietnam, such as the hospitality industry (Hiển et al., 2021), agriculture (Kim, 2018), tourism (Do et al., 2020a), building and manufacture of materials (Le, 2020), trade and industry (Do et al., 2020b), and fisheries (Yến, 2016). The results indicate that Vietnamese companies' willingness to implement sustainability strategies is limited. The most important motivation for companies to implement these operational strategies is to meet customer requirements. A survey of 234 Vietnamese companies found that more than 56% did not carry out any ESG activities in operations during the 2022–2023 period (Kok & Yap, 2024). A lack of official liability regulations (156/234 companies, ~67%), limited awareness of top organizational leaders regarding sustainability strategy implementation (152/234 companies, ~65%), and a lack of management skills in sustainability strategies among direct managers at each stage of the companies' supply chain (145/234 companies, ~62%) were the biggest challenges in implementing ESG in operations. The results suggest that the improvement of awareness of benefits, wide sharing of the requirements of sustainability strategies, and positive impacts of sustainability strategy activities on financial performance need to be considered to enhance the implementation of sustainability strategies by companies in Vietnam.

To the best of our knowledge, no study has examined whether implementing sustainability strategies in operations can mitigate the negative impact of uncertain events on the stock price volatility of Vietnamese companies. Therefore, this study investigated the effect of implementing sustainability strategies in operations on the abnormal stock returns of listed Vietnamese companies under uncertain conditions, using an event study of the COVID-19 outbreak.

The research results are expected to inform a scientifically supported approach to help companies mitigate the negative impacts of uncertain events. The results of this study might be useful empirical evidence for investors and shareholders in the investment decision-making process in the stock market, not only in Vietnam, but also in other stock markets in the world under similar conditions. The second section of this study presents the materials and methods, with three sub-sections, including the research framework and hypotheses, data collection, and data analysis. The results are addressed in the next part, and following this is the discussion part. Finally, the conclusion and implications are summarized, and future directions based on the main findings of this study are discussed.

2. Materials and Methods

2.1. Research Framework and Hypotheses

The implementation of sustainability strategies in operations may increase management skills and improve top leaders' awareness of sustainable development. Therefore, the implementation of sustainability strategies by companies, especially those that depend on imported raw materials, may play a crucial role in maintaining resilient operations during a crisis (Fasan et al., 2021). Thus, this might increase investor confidence that a company with sustainability strategy approaches might be able to quickly respond, minimize the damages of the negative impacts, and have capacity to maintain operations better than those companies that do not implement sustainability strategies (Darnall et al., 2019; Hoejmose et al., 2014; Liu et al., 2017; Luthra et al., 2014; Qiu et al., 2021).

Additionally, from the perspective of the resource dependence theory (Adelman, 1951; Pfeffer & Salancik, 2015), companies must rely on resources from other companies and stakeholders to implement sustainability strategies in operations (Chiang & Chuang, 2024). This is because a company cannot fully obtain the resources necessary to achieve the desired

outcomes from sustainable strategies. A particular resource might play a crucial role in implementing the sustainable strategies of one company but might be less important for those of another (Barney, 1991, 2018; Pfeffer & Salancik, 1978). Therefore, companies were encouraged to obtain specific types of resources that significantly contributed to their competitiveness instead of striving to own all the resources. This might help increase their level of dependence on other companies, enabling them to internalize external resources as internal resources (Perrow, 1986).

Moreover, companies' top leaders were challenged to make strategic decisions toward beneficiaries, ensuring that all stakeholders, including customers, employees, suppliers, shareholders, and society, are included in the context of globalization (Freeman & Phillips, 2002). These stakeholders might consist of people from various functional sectors, including sustainable manufacturing and product/service delivery initiatives (Durugbo & Amankwah-Amoah, 2019; Hmouda et al., 2024). Consequently, this might be a signal for investors to focus on a commitment to sustainability issues in operations with both internal and external stakeholders (Fasan et al., 2021). In the long term, implementing sustainable strategies is expected to lead to benefits in uncertain conditions. This might increase investors' confidence in the potential capacity for resilience and maintenance of operations owing to the implementation of sustainability strategies. It might also force an increase in companies' stock prices and reduce negative volatility in crises (Danso et al., 2019; Durugbo & Amankwah-Amoah, 2019; Fasan et al., 2021; Park & Li, 2021; Qiu et al., 2021).

Based on the above perspectives, we hypothesized that the implementation of operational sustainability strategies would have a positive impact on the abnormal stock returns of companies in the context of the COVID-19 pandemic, as described below.

Hypothesis (H): *The implementation of sustainability strategies, including economic, environment, and social aspects in operations, has a positive impact on the abnormal stock returns of the companies listed on the Vietnamese stock market during the COVID-19 outbreak.*

Regardless of the effectiveness of implementing sustainable supply chain management strategies, as previously discussed, companies might quickly restrain their adoption of these strategies in case they have to face new and difficult-to-predict challenges (Amankwah-Amoah, 2020). Previous research pointed out that companies might not continuously maintain momentum for the adoption of sustainability strategies when their financial resources are under severe pressure, as was the case during the COVID-19 outbreak (Fasan et al., 2021). Therefore, as shown in Figure 1, the control variables, which are presented as the financial resource factors, including the return-on-assets (ROA) ratio, company size, financial leverage, Tobin's Q ratio, and market-to-book (MTB) value, were included in the models to examine their impacts on the abnormal stock returns of companies listed on the market.

The ROA ratio is an indicator of a company's financial efficiency and is hypothesized to have a positive influence on abnormal stock returns (Baskin, 1989; Mayuni & Suarjaya, 2018; Ramadhani & Nur, 2024). Financial leverage was measured using the debt-to-total-equity ratio. An appropriate proportion of financial leverage may enhance a company's profitability and is expected to have a positive impact on abnormal stock returns (Kumala et al., 2024). Total assets are presented as the scale of companies and their resources and stability in operations (Bhat et al., 2020; Dong et al., 2023). Thus, investors tend to be more confident about larger-scale companies than smaller-scale companies. Under uncertain conditions, the stocks of larger companies are preferred for investment and/or holdings, suggesting that stock prices and abnormal returns may increase (Acheampong et al., 2014; Arslan et al., 2014; Mayuni & Suarjaya, 2018).

The MTB ratio is the ratio of a company's stock market price to its book value (Brigham & Houston, 2019). Previous studies have indicated that the market value of a company is expected to increase with better business performance (Dong et al., 2023). Therefore, it positively impacts abnormal stock returns (Ashraf, 2020). Tobin's Q ratio is measured as the market value divided by the total book value of a company (Agustina & Pawestri, 2023). The value of Tobin's Q ratio ranges from 0 to 1, meaning that the cost of replacing a firm's assets is greater than the value of its stock. A high Tobin's Q value for a company is expected to increase shareholders' investment profitability (Fama & French, 1992). Therefore, Tobin's Q plays a significant role in investors' investment decisions. The higher the stock price of a company, the higher the company's market value and the higher the abnormal stock returns for investors (Nguyen et al., 2024).

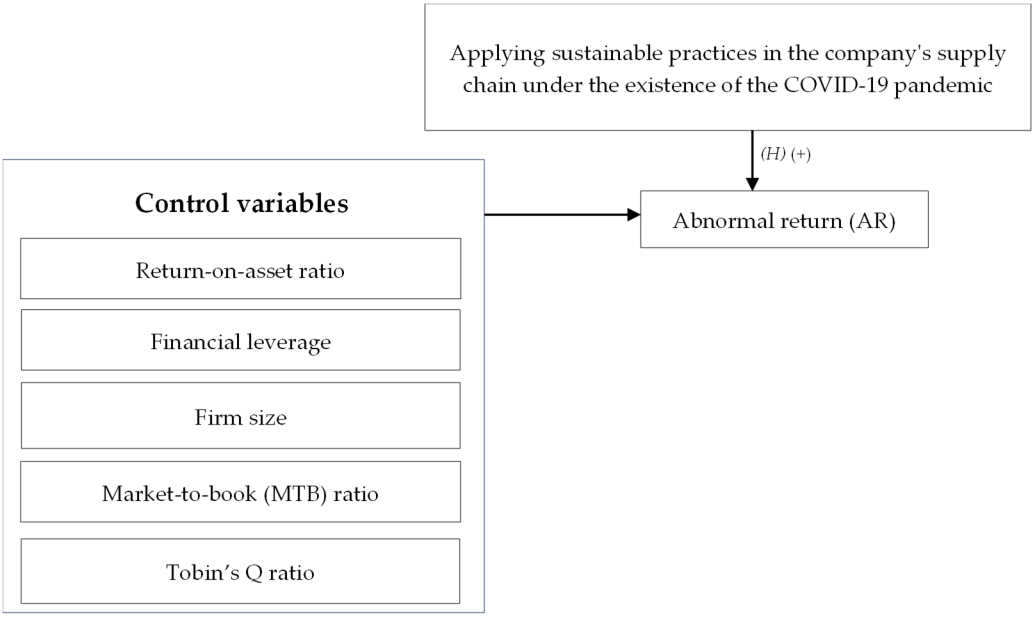


Figure 1. Theoretical framework of the effects of the implementation of sustainability strategies in operations on the abnormal stock returns of listed companies. Source: summarized from the theoretical framework and research hypotheses.

2.2. Data Collection

As previously discussed, the VNSI is a publicly standardized benchmark, distinguishing between companies integrating sustainable practices and those that do not, among Vietnamese companies listed on the Ho Chi Minh Stock Exchange (HOSE). The companies listed in the VNSI group are the top 20 companies of the VN100 list, evaluated and filtered based on their sustainability development scores in environmental (E), social (S), and corporate governance (G) by using the market capitalization method adjusted for free float. Although the VNSI is designed to be dynamic, reflecting annual changes in companies' sustainability practices, a company's inclusion requires it to meet a certain threshold of sustainability performance relative to its peers within the VN100. Therefore, companies that have previously invested in sustainability initiatives may continue to benefit from these investments even if their current ESG scores no longer qualify for the VNSI. However, implementing sustainability strategies in the operations of companies involves responding to customer requirements and achieving economic performance, including market, operational, and financial efficiencies, without negative impacts on the environment or social welfare. Therefore, these legacy effects might have still influenced stock performance during the COVID-19 pandemic.

Hence, the data used in this study were collected from 107 companies listed on the Ho Chi Minh Stock Exchange (HOSE) in Vietnam and belonging to the VN100 list. The treatment group included 41 companies (~38.3%) that were presented in all the lists for calculating the VNSI by the HOSE from July 2017 to March 2020 and was defined as the group of companies implementing sustainability strategies in regard to the economy, environment, and society. The control group consisted of 66 companies (~61.7%) that were listed on the VN100 but did not belong to the group considered for calculating the VNSI, and was defined as the group of companies that did not implement sustainability strategies in their operations.

The event window data used to calculate abnormal returns were the daily stock prices of the 107 companies in the sample. The data ranged from 2 January 2020, which was the first trading session of the Vietnamese stock market in 2020, to 31 March 2020, accounting for 59 trading days in the Vietnamese stock market. Overall, the sample size comprised 6313 observations. Stock prices and information on the control variables included in the research model were collected from the Vietstock Finance portal. The breakdown of the periods is as follows:

- The period from 2 January 2020 to 31 March 2020 captured the overall effects of the COVID-19 pandemic on the Vietnamese stock market during the first quarter of 2020 and was utilized to assess the general effects of the pandemic on abnormal stock returns.
- The period between 2 January 2020 and 23 February 2020 served as a baseline, representing the stock market conditions before the widespread recognition of the negative impacts of the COVID-19 pandemic to establish a benchmark for comparison against the period affected by the pandemic.
- The period from 24 February 2020 to 31 March 2020 was considered the starting date for when the negative impacts of the COVID-19 pandemic on the economy, society, and global stock markets were first reported (Albuquerque et al., 2020; Fasan et al., 2021; Ramelli & Wagner, 2020). This period was used as an event window to assess the impact of the COVID-19 outbreak and compare the changes in abnormal returns between companies that did and did not implement sustainability strategies during the outbreak. During this period, the VN-Index also experienced a significant decline owing to negative news related to the COVID-19 pandemic, both globally and in Vietnam.
- The period from 11 March 2020 to 31 March 2020 was used as the second event window, aiming to emphasize the impact of global news of the COVID-19 outbreak on the differences in abnormal stock returns of companies that did and did not implement sustainability strategies in their operations.

As Figures 2 and 3 show, there was a pronounced decline in the Vietnamese stock market in the first quarter of 2020. This period coincided with the initial outbreak of the COVID-19 pandemic in Vietnam, occurring prior to the nationwide implementation of social distancing measures under Directive 16/CT-TTg, which was effective from 1 April 2020. These included urgent measures to prevent and control the COVID-19 pandemic. Furthermore, this study investigated a second event window ranging from 11 March 2020 to 31 March 2020. This timeframe aligns with the World Health Organization (WHO)'s declaration of COVID-19 as a global pandemic on 11 March 2020. This second event window was used to emphasize the impact of global news of the COVID-19 outbreak on the differences in abnormal stock returns of companies that did and did not implement sustainability strategies in their operations.

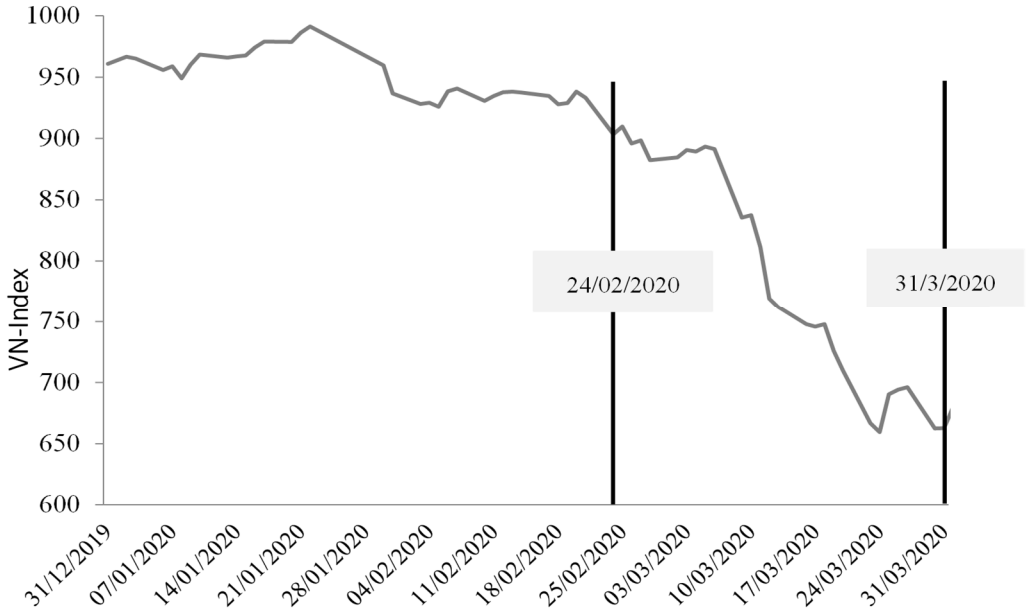


Figure 2. Statistical data of the VN-Index in the first quarter of 2020. Source: calculated based on the data published on investing.com.

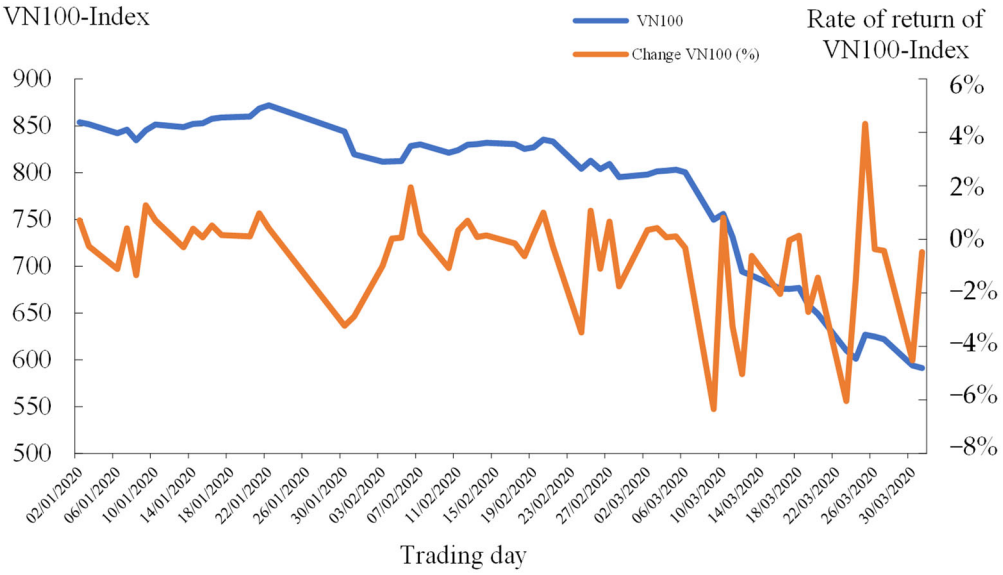


Figure 3. Statistical data of the changes in the VN100-Index in the first quarter of 2020. Source: calculated based on the data published on investing.com.

2.3. Data Analysis

Previous studies have presented the event study method and the difference-in-differences (DID) analysis as approaches for investigating the impact of implementing sustainability strategies on a company's stock price volatility under uncertain conditions (Albuquerque et al., 2020; Borusyak et al., 2024; Castro-Iragorri, 2019; Fasan et al., 2021). The event study methodology and the DID approach were applied to investigate the differences in abnormal return between two groups of companies that did and did not implement sustainability strategies in their operations during the COVID-19 pandemic period.

The event window was explored to calculate the abnormal return of companies listed on the Vietnamese stock market in the context of the pandemic (Fasan et al., 2021). In this study, the Capital Asset Pricing Model (CAPM) was explored to detect the unexpected volatility of stock prices associated with a specific event, specifically within the context of

crises and conditions of uncertainty (i.e., the COVID-19 pandemic). The steps for calculating the abnormal return of stock ith on day tth are presented as follows (Godfrey et al., 2009; MacKinlay, 1997; Mio & Fasan, 2012):

- Step 1: Estimate the ratio of the return rate of the market on day tth to the return rate of stock ith on day tth based on the regression shown in Equation (1). The dataset used for estimation was obtained from the daily data of the return rate of the market and return rate of stock data during the period from 2 January to 31 December 2019 of 107 companies (equivalent 26,750 observations).

  The basic regression model is as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + u_{it} \quad (1)$$

where

R_{it}: the rate of return of stock ith, determined by Formula (2):

$$R_{it} = \ln \frac{P_{i,t}}{P_{i,t-1}} \quad (2)$$

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

R_{mt}: the return rate of the market, determined by Formula (3):

$$R_{mt} = \ln \frac{VNIndex_t}{VNIndex_{t-1}} \quad (3)$$

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

α_i: intercept

β_i: coefficient representing the ratio of the return rate of the market on day tth to the return rate of stock ith on day tth.

- Step 2: investigate the abnormal return of ith based on the transformed function, as presented in Equation (4):

$$u_{it} = AR_{it} = R_{it} - \left(\hat{\alpha}_1 + \hat{\beta}_1 R_{mt}\right) \quad (4)$$

where

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

$\hat{\alpha}_1$, $\hat{\beta}_1$: the estimated coefficients of α and β, as determined using the ordinary least-squares (OLS) method in Equation (1).

The objective of this study was to examine the effect of implementing sustainable supply chain strategies on the abnormal returns of companies during the COVID-19 outbreak based on two estimation steps. First, the panel data regressions (e.g., pooled OLS, fixed-effects regression, and random-effects regression), which are independent from the COVID-19 outbreak setting, were estimated to investigate the main effects of implementing sustainable supply chain management strategies on the daily abnormal returns of sampled 107 companies from 2 January 2020 to 31 March 2020, controlling for the financial resource factors, including the return-on-assets (ROA) ratio, company size, financial leverage, Tobin's Q ratio, and market-to-book (MTB) value. In Vietnam, companies listed on the stock market are required to disclose quarterly financial statements. Following prior studies (Fasan et al., 2021; Albuquerque et al., 2020), the data of the control variables included in

the regression models for each trading day within a quarter were presented at the same value to address the time invariance. Statistical tests, including the F-test, Breusch–Pagan Lagrangian test, and Hausman test, were explored to finalize the best-fit models to show the impacts of the implementation of sustainability strategies in operations on abnormal stock returns between 2 January 2020 and 31 March 2020.

Second, the difference-in-differences model, presented in Equation (1), was used to investigate the significant impacts of implementing supply chain management strategies on companies' abnormal stock returns during the COVID-19 pandemic outbreak from 2 January 2020 to 31 March 2020. Following the difference-in-differences methodology employed in previous research (Borusyak et al., 2024; Castro-Iragorri, 2019), the interaction variable $SP * \text{COVID}$ indicated the differences in abnormal returns of the groups of companies that did and did not implement sustainable supply chain management strategies in pre-COVID-19 and during the COVID-19 period. The reduced form of the difference-in-differences regression model is presented as follows:

$$\text{AR}_{\text{it}} = \beta_1 \text{SP}_{\text{it}} + \beta_2 \text{COVID}_{\text{t}} + \beta_3 \text{SP}_{\text{it}} * \text{COVID}_{\text{t}} + \sum_{k=4}^{n} \beta_k \text{X}_{\text{kit}} + \varepsilon_{\text{it}} \quad (5)$$

where

SP_{it}: the implementation of sustainable practices by company ith $(\text{i} = 1;107)$ on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.

COVID_{t}: present for the COVID-19 outbreak during the period from 2 January 2020 to 31 March 2020.

X_{kit}: the control variable k $(k = 4;8)$ of company ith $(\text{i} = 1;107)$ on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.

β_1: the average difference in abnormal return between companies that did and did not implement sustainability strategies in their operations.

β_2: the average difference in abnormal return of the companies in the sample before and after the COVID-19 pandemic.

β_3: the average difference in abnormal return between the two groups of companies that did and did not implement sustainability strategies in their operations before and after the COVID-19 pandemic.

$\beta_k (k = 4;8)$: the coefficients of the control variables in the model; ε: the error term of the model.

AR_{it}: the abnormal stock return of company ith $(\text{i} = 1;107)$ on trading day t $(t = 1;59)$ during the period from 2 January 2020 and 31 March 2020.

A description of the variables included in the regression models is presented in Table 1.

Table 1. Description of abnormal return and factors affecting the abnormal return of companies listed on the Vietnam stock market included in the regression model.

Variables	Description	Mean (N = 6313)	SD
	Dependent variable		
AR_{it}	The abnormal stock return of company ith $(\text{i} = 1;107)$ on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.	0.001	0.023
Independent variables			
SP_{it}	SP obtains the value of 1 and 0 to describe the group of companies that did and did not implement sustainability strategies, respectively.	Dummy variable	

Table 1. *Cont.*

Variables	Description	Mean (N = 6313)	SD
$COVID_t$	Obtains the value of 1 for the trading days during the period from 24 February 2020 to 31 March 2020 and obtains the value of 0 for trading days during the period from 2 January 2020 to 23 February 2020 (for the first event window). Obtains the value of 1 for the trading days during the period from 11 March 2020 to 31 March 2020 and obtains the value of 0 for trading days during the period from 2 January 2020 to 10 March 2020 (for the second event window)	Dummy variable	
$SP_{it} * COVID_t$	The interaction between the variable SP_{it} and the variable COVID	Interaction variable	
X_{4it}	Tobin's Q ratio of company ith $(i = 1;107)$ on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.	1.252	0.771
X_{5it}	Return-of-assets ratio of company ith $(i = 1;107)$on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.	1.424	1.191
X_{6it}	Market-to-book (MTB) value of company ith $(i = 1;107)$on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.	1.457	1.150
X_{7it}	Scale of company ith $(i = 1;107)$on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020, measured by the logarithm of total assets of the company ith $(i = 1;107)$on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.	16.426	1.661
X_{8it}	Financial leverage of company ith $(i = 1;107)$ on trading day t $(t = 1;59)$ during the period from 2 January 2020 to 31 March 2020.	0.529	0.217

Source: summarized from the research model and calculated from the statistical data collected from 107 companies in the sample for 59 trading days from 2 January 2020 to 31 March 2020, equivalent to 6313 observations; SD: standard deviation. Note: the data of control variables from X_4 to X_8 were disclosed quarterly. Therefore, in this estimation, the daily data for these variables were presented at the same value for each trading day within a quarter.

3. Results and Discussion

3.1. The Impact of Implementing Sustainability Strategies in Operations on Abnormal Stock Returns of Companies Listed on the Vietnam Stock Market Between 2 January 2020 and 31 March 2020

The estimated results of the regression models used for investigating the impact of implementing sustainability strategies in operations on the abnormal stock returns of companies listed on the Vietnamese stock market during the COVID-19 outbreak for the whole dataset from 2 January 2020 to 31 March 2020 are illustrated in Table 2. The correlation analysis illustrated that there is potentially a positive relationship between companies in the sample implementing sustainable supply chain management strategies and abnormal returns (as presented in Table 3). As described in the data analysis section, the impact of implementing these strategies on the abnormal stock returns of 107 companies was first estimated using panel data regression, including pooled OLS, a fixed-effects model (FEM), and a random-effects model (REM). Statistical tests—the F-test, Breusch–Pagan Lagrangian test, and Hausman test—showed that FEM was the best regression model for estimating this impact during the sampling period from 2 January 2020 to 31 March 2020 ($p < 0.05$). The Wald test was then used to test for heteroscedasticity in the FEM results, revealing heteroscedasticity ($p < 0.01$). The FGLS regression model was used to address this problem (Judge et al., 1988).

Table 2. Impact of implementation of sustainability strategies in operations, controlling for financial resource variables, on the abnormal stock return of companies listed on the Vietnam stock market for the whole dataset from 2 January 2020 to 31 March 2020, with the regressions estimated independently from the COVID-19 outbreak setting.

Variables	Description	Period from 2 January 2020 to 31 March 2020		Period from 2 January 2020 to 23 February 2020
		FEM	FGLS Model	FGLS Model
SP	Implementation of sustainability strategies in operation of companies	-	0.00077 **	0.00056 **
X_4	Tobin's Q ratio	−0.00459	−0.00123 **	−0.00143 **
X_5	Return-on-assets ratio	−0.00020	−0.00017 *	0.00010 **
X_6	Market-to-book value	−0.00614 ***	−0.00054 *	0.00043 *
X_7	Size of companies	0.00391	0.00006	0.00005
X_8	Financial leverage	−0.02540 *	0.00211 *	0.00222 *
Constant		−0.05250	−0.00020	−0.00029
Number of observations		6313	6313	3424
F-test		4.07 ***		
Chi2 test			14.66 **	13.42 **

Source: estimated the statistical data collected from 107 companies in the sample for 59 trading days from 2 January 2020 to 31 March 2020, equivalent to 6313 observations. Note: ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Table 3. Pearson correlation matrix.

	SP	AR	TobinQ	MTB	Lev	Size	ROA
SP	1						
AR	0.011	1					
TobinQ	0.073	−0.020	1				
MTB	0.180	−0.012	0.916	1			
Lev	0.139	0.024	−0.323	−0.151	1		
Size	0.364	0.013	−0.123	0.058	0.655	1	
ROA	0.091	−0.004	0.523	0.425	−0.444	−0.307	1

Source: estimated the statistical data collected from 107 companies in the sample for 59 trading days from 2 January 2020 to 31 March 2020, equivalent to 6313 observations.

As presented in Table 2, the estimated results of the FGLS regression model indicate that at least one independent variable in the model had an impact on the abnormal stock returns of companies listed on the Vietnam stock market during the COVID-19 outbreak for the entire dataset from the sampling period ($p < 0.05$). Specifically, the estimated results show that the abnormal stock return of companies implementing sustainability strategies in their operations was 0.077% higher than that of the companies not implementing sustainability strategies in their operations ($p < 0.05$). In addition, the estimated results of the FGLS model for the period from 2 January 2020 to 23 February 2020, which was the period before the negative effects of the COVID-19 pandemic, indicate that the implementation of sustainability strategies in operations has a positive impact on the stock price volatility of companies ($p < 0.05$). The coefficients of the variable "SP" in the FGLS regression model showed that the volatility of the stock price of the group of companies that implemented sustainability strategies in their operations was 0.056% higher than that of the group of companies that did not implement sustainability strategies in their operations ($p < 0.05$). These results emphasize that implementing sustainability strategies in operations may enhance companies' stock prices (Kushwaha & Sharma, 2016; Laari et al., 2016; Lin et al., 2020; Wang et al., 2016).

3.2. Difference-in-Differences (DID) Analysis for the Impact of Implementing Sustainability Strategies in Operations on the Abnormal Stock Returns of Companies Listed on the Vietnamese Stock Market During the COVID-19 Pandemic

The results of the DID analysis are presented in Table 4. The DID analysis was performed in two steps: First, the DID regression model was estimated by including only the independent variables of COVID and SP and the interaction variables of COVID and SP. In the second step, the regression model included the independent variables from the first step and all the control variables (as previously presented in Table 1).

Table 4. Event windows of the difference-in-differences analysis for the impact of implementation of the sustainability strategies in operations on the abnormal stock return of companies listed on the Vietnamese stock market in the context of the COVID-19 pandemic.

		The First Event Window		The Second Event Window	
Variables	**Description**	**Coefficient**	**Coefficient**	**Coefficient**	**Coefficient**
COVID	COVID-19 outbreak	−0.00228 ***	−0.00268 ***	−0.00392 ***	−0.00369 ***
SP	Implementation of sustainability strategies in operation of companies	−0.00013 **	−0.00056 **	−0.00026 **	−0.00055 **
SP ∗ COVID	Interaction variable between SP and COVID	0.00220 **	0.00183 **	0.00179 **	0.00115 **
X_4	Tobin's Q ratio		−0.00124 *		−0.00127 *
X_5	Return-on-assets ratio		−0.00053 **		−0.00062 **
X_6	Market-to-book value		0.00182 **		0.00229 **
X_7	Size of companies		0.00002		0.00004
X_8	Financial leverage		0.00016 *		0.00017 *
Constant		0.00054 ***	−0.00043 ***	0.00113 ***	−0.00088 ***
Number of observations		6313	6313	6313	6313
R2		0.004		0.004	

Source: estimated using the statistical data collected from 107 companies in the sample from 2 January 2020 to 31 March 2020; ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Regarding the first event window, the estimated results of the DID analysis showed that the abnormal return of companies decreased by 0.2–0.3 percentage points ($p < 0.01$) between 24 February 2020 and 31 March 2020 compared to between 2 January 2020 and 23 February 2020 (Ahmar & Del Val, 2020; Al-Awadhi et al., 2020; Baker et al., 2020; He et al., 2020; Zhang et al., 2020). The spread of COVID-19 had a negative impact on the business operations of companies in all economic sectors, resulting in a decrease in investor confidence in the stock market and stock prices of companies.

The second window event represented the period after WHO declared COVID-19 a global pandemic, which began on 11 March 2020 (WHO, 2020). A similar result was found for this window event as for the first window event, which started on 24 February 2020. After WHO announced the COVID-19 as a global pandemic, the Vietnamese stock market continuously decreased, indicating a negative effect on the abnormal stock returns of listed companies ($p < 0.01$). In addition, the results for this event window could not confirm the significant positive effects of the implementation of sustainability strategies on the operations of companies, which is aligned with the results of the first event window ($p < 0.05$).

Regarding the control variables, the results also indicate that higher financial leverage and market-to-book values ($p < 0.05$) have significant positive effects on companies' abnormal stock returns ($p < 0.05$). This result corresponds with previous studies, since an appropriate debt-to-total-assets ratio has been indicated as a factor affecting the more effective exploration of funding sources, contributing to increases in market value, im-

provements in shareholder confidence, and a positive impact on abnormal stock returns in advance (Dhasmana et al., 2023).

Conversely, the results show that a higher Tobin's Q ratio ($p < 0.1$) and return-on-total-assets ratio ($p < 0.1$) indicate lower abnormal stock returns for companies during the COVID-19 outbreak. These results do not correspond with the fundamental perspective of the resource-based theory (Barney, 1991) or previous studies (Baskin, 1989; Mayuni & Suarjaya, 2018; Ramadhani & Nur, 2024), since higher market capitalization and better financial resources are significant positive factors influencing companies' abnormal stock returns.

4. Discussion

The DID analysis revealed that companies implementing sustainability strategies in their operations had lower abnormal returns than those that did not implement such strategies when the COVID-19 outbreak variable was included in the regression model ($p < 0.05$). These findings, which are aligned with the results of the regression models presented in Table 2, suggest that the implementation of sustainability strategies in operations may have a positive impact on the abnormal stock returns of companies, as indicated by the estimation of the entire dataset. However, the results did not confirm that these strategies might have been a critical factor in ensuring stability and positively impacting a company's stock price during the COVID-19 pandemic ($p < 0.05$) (Feng et al., 2018; Laari et al., 2018; Hardiningsih et al., 2020; Negri et al., 2021). This can be explained by the fact that the implementation of sustainability strategies in companies' operations might not be a direct factor that enhances their financial performance; instead, it may increase costs and decrease companies' financial efficiency in the short run (Ahmed et al., 2024). The positive impact of a company's implementation of sustainability strategies might be achieved indirectly in the long term only through the improvement of the company's reputation, enhanced collaboration with stakeholders, and increased customer, shareholder, and stakeholder trust, thereby enhancing business performance.

In addition, the results estimated in this study showed a positive coefficient of the interaction variable (SP * COVID) at the value of 0.2 percentage points ($p < 0.05$), suggesting that there was a positive difference in the abnormal returns of companies that did and did not implement sustainability strategies in their operations during the two stages of the COVID-19 outbreak in the first event window. In other words, the companies who implemented sustainability strategies in their operations might have experienced higher abnormal stock returns between 24 February 2020 and 31 March 2020 compared to those companies that did not implement sustainability strategies in their operations between 2 January 2020 and 23 February 2020 ($p < 0.05$).

The results of this study indicate a positive relationship between the interaction variable of the implementation of sustainability strategies in companies' operations and the COVID-19 pandemic (SP * COVID) and abnormal stock returns of companies ($p < 0.05$). This result confirmed that the implementation of sustainability strategies might have supported a reduction in the volatility of stock prices during the COVID-19 outbreak (Abbas & Tong, 2023; Albuquerque et al., 2020; Danso et al., 2019; Fasan et al., 2021; Givens, 2024; Išoraitė, 2024; Lin et al., 2020; Quintana-García et al., 2021; Seuring et al., 2022; Shekarian et al., 2022). By conducting activities aimed at implementing sustainability in the economy, environment, and society, companies can gain a better capacity to meet customer requirements, comply with government regulations and those of other organizations and institutions, and improve their relationships with suppliers and other stakeholders (Svensson et al., 2018; Damert et al., 2021; Le et al., 2024). This suggests that the implementation of sustainability strategies in the operations of companies might therefore help companies mitigate negative impacts and

maintain stability in operations in the short term, thereby enhancing their business resilience and creating competitive advantages in the long term in the context of uncertain conditions.

On the other hand, the results of this study regarding the effect of Tobin's Q ratio and the return-on-total-assets ratio on the abnormal stock returns of companies are consistent with the perspectives of the resource dependency theory (Emerson, 1962; Pfeffer & Salancik, 2015) and stakeholder theory (Freeman, 1984, 2010; Freeman & Phillips, 2002). It has been argued that larger-scale companies aligned with deeper internationalization may have more complex supply chain networks. Therefore, they are highly dependent on customers and suppliers from other countries. Meanwhile, the COVID-19 pandemic disrupted global supply chains, which has negatively impacted the supply quantity and prices of international material sources and increased operation costs. Under these conditions, companies focused on improving sustainability issues in their operations might have achieved better opportunities to maintain business during the COVID-19 outbreak by utilizing collaborative strategies in their relationships with stakeholders, especially global suppliers (Barbosa & Cansino, 2024; Nazir et al., 2024; He & Harris, 2020; Nguyen et al., 2024; Seuring et al., 2022; Yang et al., 2019; Xu et al., 2020; Xu et al., 2024). Furthermore, efforts to implement sustainability strategies are expected to reinforce companies' competitive advantages in the post-COVID-19 era. This is because the implementation of sustainability strategies in operations might increase a company's ability to develop new products in response to the increase in demand for sustainable products from international customers. This might help companies achieve long-term business resiliency (Fasan et al., 2021; Išoraitė, 2024; Sun et al., 2022; Zhu et al., 2017).

5. Conclusions and Implications

This study aimed to examine the impact of implementing operational sustainability strategies on the abnormal stock returns of companies listed on the Vietnamese stock market under uncertain conditions, based on empirical evidence from the COVID-19 pandemic. The data used in this study were collected from 107 listed companies in the Vietnamese stock market, including 41 and 66 companies with and without sustainability strategies for economic, environmental, and social welfare, respectively. Based on the main findings of this study, it was concluded that the abnormal stock returns of companies implementing sustainability strategies in their operations were higher than those of companies not implementing such strategies in the context of the COVID-19 pandemic. Previous research has argued that the implementation of sustainable supply chain management strategies might not create the economics benefits for the companies. The main findings in this study highlight the effectiveness of implementing sustainability strategies in conditions of uncertainty (i.e., the COVID-19 pandemic and/or other inevitable future scenarios), which might have a long-lasting impact on the global economy. This result indicates that implementing sustainability strategies in operations may help companies improve their resilience and ability to recover quickly from crises and risky conditions. Although implementing sustainability strategies may incur short-term costs, their long-term benefits can enhance a company's ability to mitigate damage from crises and risk conditions. Therefore, integrating sustainability into operations could be a critical strategy for listed companies to gain investors' and shareholders' confidence during times of uncertainty, supporting financial stability and strengthening resilience.

The assessment of the sustainability practices of companies, as operationalized in this study, was based on the VNSI under binary values distinguishing between a group of companies that implemented sustainability strategies and a group of companies that did not. In Vietnam, the VNSI represents a standard benchmark criterion and so could be used to determine the extent to which companies implemented sustainability strategies.

However, the current binary classification scale for sustainability strategies has several limitations owing to its oversimplified nature. Although this approach provides basic differentiation, it fails to capture the complexities and subtleties inherent in implementing sustainability strategies. A significant constraint lies in the lack of granularity, as binary classification disregards variability in the extent of implementation. Companies in the VNSI group may exhibit a wide range of sustainability practices, from comprehensive integration to meeting the minimum inclusion criteria. By contrast, entities outside the VNSI classification may engage in sustainable practices that are unacknowledged in this binary system. Additionally, the assumption of homogeneity within the "implementation" cohort is problematic since the implementation of sustainability practices across all VNSI-listed companies was assumed to be at the same level, thereby ignoring potential disparities in commitment and efficacy. This simplification may distort the findings and lead to misinterpretation of the impact of sustainability strategies on abnormal stock returns.

Moreover, the VNSI is designed to reflect sustainability practices within Vietnam and may be sensitive to the specific context of the Vietnamese stock market. Its criteria may not align with international standards or capture all relevant aspects of sustainability. Therefore, future research might consider applying the conceptual framework discussed to measure sustainability practices using a continuous scale or a composite index that incorporates multiple indicators and dimensions of sustainability. This would allow for a more accurate and detailed assessment of companies' sustainability efforts toward the SDGs and their impact on the market value and financial performance of companies, not only in Vietnam but also worldwide.

Notably, the results indicate that higher financial leverage ($p < 0.1$) and MTB values ($p < 0.05$) positively affect companies' abnormal stock returns. However, the results also show the other control variables that presented financial advantages for companies, including the ratios of Tobin's Q ($p < 0.1$) and return on total assets ($p < 0.05$), which had negative impacts on the abnormal stock returns of companies during the COVID-19 outbreak. This means that the negative impact of the COVID-19 pandemic on larger-scale companies in connection with internalized operations might be greater owing to the disruption of the global supply chain, as these companies are more dependent on resources from international suppliers and other stakeholders. These recent results support the reinforcement of the implementation of sustainability strategies in operations, which calls for the collaboration and integration of stakeholders in companies' supply chains for the mitigation of damages. This would help companies maintain operations, improve their competitive advantage, and ensure long-term economic efficiency under risks and uncertain conditions. In connection with these results, future research should discuss alternatives to enhance the implementation of sustainable supply chain management strategies, and the effects of these strategies on company performance should be carefully considered.

Furthermore, the results of this study highlight the need for long-term strategies to enhance sustainability in company operations, ensuring the sustainable management of suppliers and customers and promoting sustainable production and operations. Therefore, sustainable supply chain management activities should be conducted in alignment with strategies that call for the collaboration of stakeholders along companies' supply chain. In addition, the results of this study provide a scientific basis for investors and shareholders to consider the effects of sustainability in the operations of listed companies in the investment decision-making process to reduce the volatility of stock prices under risks and uncertain conditions.

Author Contributions: Conceptualization, N.T.N.H., K.T.P.D.; methodology, K.T.P.D., N.T.N.H., N.K.K., N.M.C.; validation, N.T.N.H., K.T.P.D., N.K.K.; formal analysis, N.T.N.H.; investigation, N.K.K.; resources, N.K.K.; data curation, K.T.P.D.; writing—original draft preparation, K.T.P.D.,

N.T.N.H.; writing—review and editing, N.T.N.H., N.M.C.; supervision, K.T.P.D. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available as the copyright belongs to the administration.

Acknowledgments: The authors would like to thank the two anonymous experts for checking the English of the first draft of the manuscript. We would like to thank you for the anonymous reviewers for critical comments and recommendations to improve our manuscript.

Conflicts of Interest: The authors declare no conflicts of interest.

References

Abbas, H., & Tong, S. (2023). Green supply chain management practices of firms with competitive strategic alliances—A study of the automobile industry. *Sustainability*, *15*(3), 2156. [CrossRef]

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*, *5*(1), 125–134. [CrossRef]

Adelman, M. A. (1951). The measurement of industrial concentration. *The Review of Economics and Statistics*, *33*, 269–296. [CrossRef]

Agustina, M. P., & Pawestri, H. P. (2023, January 30–31). *Effect of return on equity, debt to asset ratio, and inflation rate on the value of the company* [Conference session]. Conference on Economic and Business Innovation (CEBI) (pp. 22–32), Sydney, Australia.

Ahmar, A. S., & Del Val, E. B. (2020). SutteARIMA: Short-term forecasting method, a case: COVID-19 and stock market in Spain. *Science of the Total Environment*, *729*, 138883. [CrossRef] [PubMed]

Ahmed, H., Al Bashar, M., Taher, M. A., & Rahman, M. A. (2024). Innovative approaches to sustainable supply chain management in the manufacturing industry: A systematic literature review. *Global Mainstream Journal of Innovation, Engineering & Emerging Technology*, *3*(02), 1–13. [CrossRef]

Ahmed, W., Ahmed, W., & Najmi, A. (2018). Developing and analyzing framework for understanding the effects of GSCM on green and economic performance: Perspective of a developing country. *Management of Environmental Quality: An International Journal*, *29*(4), 740–758. [CrossRef]

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*, *27*, 100326. [CrossRef]

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*, *9*(3), 593–621. [CrossRef]

Amankwah-Amoah, J. (2020). Stepping up and stepping out of COVID-19: New challenges for environmental sustainability policies in the global airline industry. *Journal of Cleaner Production*, *271*, 123000. [CrossRef]

Anh, D. L. T., & Gan, C. (2020). The impact of the COVID-19 lockdown on stock market performance: Evidence from Vietnam. *Journal of Economic Studies*, *48*(4), 836–851. [CrossRef]

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*, *5*(19), 68–74. Available online: https://dl1.vatanfile.ir/03/3f31a4d6ed473a7e454a.pdf (accessed on 15 June 2021).

Ashraf, B. N. (2020). Stock markets' reaction to COVID-19: Cases or fatalities? *Research in International Business and Finance*, *54*, 101249. [CrossRef] [PubMed]

Baker, S. R., Bloom, N., Davis, S. J., Kost, K., Sammon, M., & Viratyosin, T. (2020). The unprecedented stock market reaction to COVID-19. *The Review of Asset Pricing Studies*, *10*(4), 742–758. [CrossRef]

Barbosa, M. W., & Cansino, J. M. (2024). The impacts of environmental collaboration on the environmental performance of agri-food supply chains: A mediation-moderation analysis of external pressures. *International Journal of Logistics Research and Applications*, *27*, 2712–2736. [CrossRef]

Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*(1), 99–120. [CrossRef]

Barney, J. B. (2018). Why resource-based theory's model of profit appropriation must incorporate a stakeholder perspective. *Strategic Management Journal*, *39*(13), 3305–3325. [CrossRef]

Baskin, J. (1989). Dividend policy and the volatility of common stocks. *Journal of Portfolio Management*, *15*(3), 19. [CrossRef]

Bhat, D. A., Chanda, U., & Bhat, A. K. (2020). Does firm size influence leverage? Evidence from India. *Global Business Review*, *24*(1), 21–30. [CrossRef]

Borusyak, K., Jaravel, X., & Spiess, J. (2024). Revisiting event study designs: Robust and efficient estimation. *Review of Economic Studies*, *91*(6), 3253–3285. [CrossRef]

Brigham, E. F., & Houston, J. F. (2019). *Fundamentals of financial management*. Cengage Learning.

Burritt, R. L., Schaltegger, S., Bennett, M., Pohjola, T., & Csutora, M. (2011). *Environmental management accounting and supply chain management* (Vol. 27). Springer Science & Business Media. [CrossRef]

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. [CrossRef]

Castro-Iragorri, C. (2019). Does the market model provide a good counterfactual for event studies in finance? *Financial Markets and Portfolio Management*, *33*, 71–91. [CrossRef]

Chavez, R., Yu, W., Feng, M., & Wiengarten, F. (2016). The effect of customer-centric green supply chain management on operational performance and customer satisfaction. *Business Strategy and the Environment*, *25*(3), 205–220. [CrossRef]

Chiang, C., & Chuang, M.-C. (2024). Effect of Sustainable Supply Chain Management on Procurement Environmental Performance: A Perspective on Resource Dependence Theory. *Sustainability*, *16*(2), 586. [CrossRef]

Chiou, T.-Y., Chan, H. K., Lettice, F., & Chung, S. H. (2011). The influence of greening the suppliers and green innovation on environmental performance and competitive advantage in Taiwan. *Transportation Research Part E: Logistics and Transportation Review*, *47*(6), 822–836. [CrossRef]

Damert, M., Koep, L., Guenther, E., & Morris, J. (2021). Stakeholders and socially responsible supply chain management: The moderating role of internationalization. *Sustainability Accounting, Management and Policy Journal*, *12*(4), 667–694. [CrossRef]

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*, *8*(1), 1941587. [CrossRef]

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*, *28*(5), 885–895. [CrossRef]

Darnall, N., Welch, E. W., & Cho, S. K. (2019). Sustainable supply chains and regulatory policy. In *Handbook on the sustainable supply chain* (pp. 513–525). Edward Elgar Publishing. [CrossRef]

de Oliveira, U. R., Espindola, L. S., da Silva, I. R., da Silva, I. N., & Rocha, H. M. (2018). A systematic literature review on green supply chain management: Research implications and future perspectives. *Journal of Cleaner Production*, *187*, 537–561. [CrossRef]

Dhasmana, S., Ghosh, S., & Kanjilal, K. (2023). Does investor sentiment influence ESG stock performance? Evidence from India. *Journal of Behavioral and Experimental Finance*, *37*, 100789. [CrossRef]

Do, A., Nguyen, Q., Nguyen, D., Le, Q., & Trinh, D. (2020a). Green supply chain management practices and destination image: Evidence from Vietnam tourism industry. *Uncertain Supply Chain Management*, *8*(2), 371–378. [CrossRef]

Do, A. D., Nguyen, Q. V., Le, Q. H., & Van Loi, T. A. (2020b). Green supply chain management in Vietnam industrial zone: Province-level evidence. *The Journal of Asian Finance, Economics and Business*, *7*(7), 403–412. Available online: https://pdfs.semanticscholar.org/1b6e/846c3f44d466e9cc9dcc2980a3289fbeb68f.pdf (accessed on 15 June 2021). [CrossRef]

Dong, K. T. P., Hoa, N. T. N., Hiep, T. C., & Truc, T. V. T. (2023). The impact of banking relationship on firm performance: Evidence from Ho Chi Minh Stock Exchange, Vietnam. *International Journal of Business and Society*, *24*(2), 711–726. [CrossRef]

Durugbo, C., & Amankwah-Amoah, J. (2019). Global sustainability under uncertainty: How do multinationals craft regulatory policies? *Corporate Social Responsibility and Environmental Management*, *26*(6), 1500–1516. [CrossRef]

Emerson, R. M. (1962). Power-dependence relations. *American Sociological Review*, *27*(1), 31–41. [CrossRef]

Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance*, *47*(2), 427–465. [CrossRef]

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*, *30*(5), 2702–2712. [CrossRef]

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*, *27*(7), 811–824. [CrossRef]

Freeman, R., & Phillips, R. A. (2002). Stakeholder Theory: A Libertarian Defense. *Business Ethics Quarterly*, *12*(3), 331–349. [CrossRef]

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Pitman Publishing Inc.

Freeman, R. E. (2010). *Strategic management: A stakeholder approach*. Cambridge university press.

Fu, M., & Shen, H. (2021). COVID-19 and corporate performance in the energy industry. *Energy Research Letters*, *1*(1), 1–4. [CrossRef]

Givens, l. (2024). *resilience to supply chain disruptions: An investigation of the roles of innovativeness and green supply chain management practices during the COVID-19 pandemic* [University of South Alabama Institutional Repository]. Available online: https://jagworks.southalabama.edu/theses_diss/182 (accessed on 10 August 2024).

Godfrey, P. C., Merrill, C. B., & Hansen, J. M. (2009). The relationship between corporate social responsibility and shareholder value: An empirical test of the risk management hypothesis. *Strategic Management Journal*, *30*(4), 425–445. [CrossRef]

Gong, Y., Jiang, Y., & Jia, F. (2023). Multiple multi-tier sustainable supply chain management: A social system theory perspective. *International Journal of Production Research*, *61*(14). [CrossRef]

Green, K. W., Jr., Zelbst, P. J., Meacham, J., & Bhadauria, V. S. (2012). Green supply chain management practices: Impact on performance. *Supply Chain Management: An International Journal*, *17*(3), 290–305. [CrossRef]

Hamdy, O. M. M., Elsayed, K. K., & Elahmady, B. (2018). Impact of sustainable supply chain management practices on Egyptian companies' performance. *European Journal of Sustainable Development*, *7*(4), 119–130. [CrossRef]

Hardiningsih, P., Januarti, I., Yuyetta, E. N. A., Srimindarti, C., & Udin, U. (2020). The effect of sustainability information disclosure on financial and market performance: Empirical evidence from Indonesia and Malaysia. *International Journal of Energy Economics and Policy*, *10*(2), 18–25. [CrossRef]

He, H., & Harris, L. (2020). The impact of COVID-19 pandemic on corporate social responsibility and marketing philosophy. *Journal of Business Research*, *116*, 176–182. [CrossRef]

He, Q., Liu, J., Wang, S., & Yu, J. (2020). The impact of COVID-19 on stock markets. *Economic and Political Studies*, *8*(3), 275–288. [CrossRef]

Herwany, A., Febrian, E., Anwar, M., & Gunardi, A. (2021). The influence of the COVID-19 pandemic on stock market returns in Indonesia stock exchange. *The Journal of Asian Finance, Economics and Business*, *8*(3), 39–47. [CrossRef]

Hiển, L. M., Vĩnh, N. Q., Hưng, P. T., & Vân, P. T. T. (2021). Nhân tố ảnh hưởng đến quản trị chuỗi cung ứng xanh tại các khách sạn trên địa bàn Hà Nội. *Tạp Chí Tài Chính*, *1*. Available online: https://tapchitaichinh.vn/tai-chinh-kinh-doanh/nhan-to-anh-huong-den-quan-tri-chuoi-cung-ung-xanh-tai-cac-khach-san-tren-dia-ban-ha-noi-336802.html (accessed on 10 July 2022).

Hmouda, A. M. O., Orzes, G., & Sauer, P. C. (2024). Sustainable supply chain management in energy production: A literature review. *Renewable and Sustainable Energy Reviews*, *191*, 114085. [CrossRef]

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. [CrossRef]

Hoejmose, S. U., Roehrich, J. K., & Grosvold, J. (2014). Is doing more doing better? The relationship between responsible supply chain management and corporate reputation. *Industrial Marketing Management*, *43*(1), 77–90. [CrossRef]

Hörisch, J., Freeman, R. E., & Schaltegger, S. (2014). Applying stakeholder theory in sustainability management: Links, similarities, dissimilarities, and a conceptual framework. *Organization & Environment*, *27*(4), 328–346. [CrossRef]

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*, *14*(9), 441. [CrossRef]

Išoraitė, M. (2024). Sustainable supply chain management Tools. In *Lecture notes in intelligent transportation and infrastructure: Vol. Part F2296*. Springer. [CrossRef]

Judge, G. G., Hill, R. C., Griffiths, W. E., Ltitkepohl, H., & Lee, T. (1988). *Introduction to the theory and practice of econometrics*. John Wiley & Sons.

Kim, E. (2018, July 29–August 1). *Green supply chain management in organic agriculture sector: A case study in Vietnam food safety management* [Conference session]. 13th International Congress on Logistics and SCM Systems (ICLS 2018) (pp. 506–513), Ho Chi Minh City, Vietnam.

Kok, S. K., & Yap, S. (2024). *Điểm cân bằng ESG và lợi nhuận*. Available online: https://nhipcaudautu.vn/phat-trien-ben-vung/diem-can-bang-esg-va-loi-nhuan-3357191/ (accessed on 10 August 2024).

Kumala, L., Suherman, S., & Dong, K. T. P. (2024). The impact of CEO gender and educational background on capital structure. *Global Advances in Business Studies*, *3*(1), 13–25. [CrossRef]

Kushwaha, G. S., & Sharma, N. K. (2016). Green initiatives: A step towards sustainable development and firm's performance in the automobile industry. *Journal of Cleaner Production*, *121*, 116–129. [CrossRef]

Laari, S., Töyli, J., & Ojala, L. (2018). The effect of a competitive strategy and green supply chain management on the financial and environmental performance of logistics service providers. *Business Strategy and the Environment*, *27*(7), 872–883. [CrossRef]

Laari, S., Töyli, J., Solakivi, T., & Ojala, L. (2016). Firm performance and customer-driven green supply chain management. *Journal of Cleaner Production*, *112*, 1960–1970. [CrossRef]

Le, H. T. T., Hoang, H. V., & Phan, N. T. H. (2024). The COVID-19 pandemic and financial stability in Vietnam: Evidence from the interbank market. *International Journal of Social Economics*, *51*(2), 156–177. [CrossRef]

Le, T. (2020). The effect of green supply chain management practices on sustainability performance in Vietnamese construction materials manufacturing enterprises. *Uncertain Supply Chain Management*, *8*(1), 43–54. [CrossRef]

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*, *12*(16), 6454. [CrossRef]

Liu, S., Eweje, G., He, Q., & Lin, Z. (2020). Turning motivation into action: A strategic orientation model for green supply chain management. *Business Strategy and the Environment*, *29*(7), 2908–2918. [CrossRef]

Liu, W., Bai, E., Liu, L., & Wei, W. (2017). A framework of sustainable service supply chain management: A literature review and research agenda. *Sustainability*, *9*(3), 421. [CrossRef]

Luthra, S., Garg, D., & Haleem, A. (2014). Green supply chain management: Implementation and performance—A literature review and some issues. *Journal of Advances in Management Research*, *11*(1), 20–46. [CrossRef]

MacKinlay, A. C. (1997). Event studies in economics and finance. *Journal of Economic Literature*, *35*(1), 13–39. Available online: https://www.jstor.org/stable/2729691 (accessed on 10 July 2021).

Majumdar, A., Sanjib, M., & Sinha, K. (2020). COVID-19 debunks the myth of socially sustainable supply chain: A case of the clothing industry in South Asian countries. *Sustainable Production and Consumption*, *24*, 150–155. [CrossRef]

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*, *7*(8), 4063–4093. Available online: https://download.garuda.kemdikbud.go.id/article.php?article=1370117&val=989&title=PENGARUH%20ROA%20FIRM%20SIZE%20EPS%20DAN%20PER%20TERHADAP%20RETURN%20SAHAM%20PADA%20SEKTOR%20MANUFAKTUR%20DI%20BEI (accessed on 10 July 2021).

Mazur, M., Dang, M., & Vega, M. (2021). COVID-19 and the march 2020 stock market crash. Evidence from S&P1500. *Finance Research Letters*, *38*, 101690. [CrossRef]

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*, *15*, 263–284. [CrossRef]

Nazir, S., Zhaolei, L., Mehmood, S., & Nazir, Z. (2024). Impact of green supply chain management practices on the environmental performance of manufacturing firms considering institutional pressure as a moderator. *Sustainability*, *16*(6), 2278. [CrossRef]

Negri, M., Cagno, E., Colicchia, C., & Sarkis, J. (2021). Integrating sustainability and resilience in the supply chain: A systematic literature review and a research agenda. *Business Strategy and the Environment*, *30*(7), 2858–2886. [CrossRef]

Nguyen, C. T., Hai, P. T., & Nguyen, H. K. (2021). Stock market returns and liquidity during the COVID-19 outbreak: Evidence from the financial services sector in Vietnam. *Asian Journal of Economics and Banking*, *5*(3), 324–342. [CrossRef]

Nguyen, T. N. H., Khuu, T. P. D., Nguyen, Q. H., & Nguyen, M. C. (2024). 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. *WPOM-Working Papers on Operations Management*, *15*, 112–131. [CrossRef]

Nguyen, X., & Le, T. (2020). The impact of global green supply chain management practices on performance: The case of Vietnam. *Uncertain Supply Chain Management*, *8*(3), 523–536. [CrossRef]

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. [CrossRef]

Park, A., & Li, H. (2021). The effect of blockchain technology on supply chain sustainability performances. *Sustainability*, *13*(4), 1726. [CrossRef]

Perrow, C. (1986). *Complex organizations: A critical essay* (3rd ed.). Random House. Available online: https://archive.org/details/complexorganizat00perr/page/n1/mode/2up (accessed on 2 March 2025).

Pfeffer, 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*. Harper & Row.

Phuong, L. (2021). Investor sentiment by relative strength index and stock return: Empirical evidence on Vietnam's stock market. *Accounting*, *7*(2), 451–456. [CrossRef]

PRI. (2021). *Principles for responsible investment—Annual report 2021*. Available online: https://dwtyzx6upklss.cloudfront.net/Uploads/s/u/b/pri_annualreport_2021_15698.pdf (accessed on 15 September 2021).

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*, *93*, 102759. [CrossRef]

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*, *92*, 344–353. [CrossRef]

Rajesh, R. (2020). Exploring the sustainability performances of firms using environmental, social, and governance scores. *Journal of Cleaner Production*, *247*, 119600. [CrossRef]

Ramadhani, B. A., & Nur, D. I. (2024). Analysis of company value and financial performance as intervening variables in property, real estate and building construction companies on the Indonesia stock exchange. *International Journal of Economics (IJEC)*, *3*(1), 581–589. [CrossRef]

Ramelli, S., & Wagner, A. F. (2020). Feverish stock price reactions to COVID-19. *The Review of Corporate Finance Studies*, *9*(3), 622–655. [CrossRef]

Saini, N., Malik, K., & Sharma, S. (2023). Transformation of supply chain management to green supply chain management: Certain investigations for research and applications. *Cleaner Materials*, *7*. [CrossRef]

Savita, K. S., Dominic, P. D. D., & Ramayah, T. (2016). The drivers, practices and outcomes of green supply chain management: Insights from ISO14001 manufacturing firms in Malaysia. *International Journal of Information Systems and Supply Chain Management*, *9*(2). [CrossRef]

Seuring, S., & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production*, *16*(15), 1699–1710. [CrossRef]

Seuring, S., Aman, S., Hettiarachchi, B. D., de Lima, F. A., Schilling, L., & Sudusinghe, J. I. (2022). Reflecting on theory development in sustainable supply chain management. *Cleaner Logistics and Supply Chain*, *3*, 100016. [CrossRef]

Shekarian, E., Ijadi, B., Zare, A., & Majava, J. (2022). Sustainable supply chain management: A comprehensive systematic review of industrial practices. *Sustainability*, *14*(13), 7892. [CrossRef]

Sun, J., Sarfraz, M., Khawaja, K. F., & Abdullah, M. I. (2022). Sustainable supply chain strategy and sustainable competitive advantage: A mediated and moderated model. *Frontiers in Public Health*, *10*, 895482. [CrossRef]

Svensson, G., Ferro, C., Hogevold, N., Padin, C., & Sosa Varela, J. C. (2018). Developing a theory of focal company business sustainability efforts in connection with supply chain stakeholders. *Supply Chain Management: An International Journal*, *23*(1), 16–32. [CrossRef]

Truong, Q.-T., Nguyen, D. N., Tran, Q.-N., Al-Mohamad, S., & Bakry, W. (2020). *COVID-19 in Vietnam: What happened in the stock market?* Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3654017 (accessed on 10 July 2021).

Utomo, C. D., & Hanggraeni, D. (2021). The impact of COVID-19 pandemic on stock market performance in Indonesia. *The Journal of Asian Finance, Economics and Business*, *8*(5), 777–784. [CrossRef]

Vo, D. H., Ho, C. M., & Dang, T. H.-N. (2022). Stock market volatility from the COVID-19 pandemic: New evidence from the Asia-Pacific region. *Heliyon*, *8*(9), e10763. [CrossRef]

Wang, X., Cai, H., & Florig, H. K. (2016). Energy-saving implications from supply chain improvement: An exploratory study on China's consumer goods retail system. *Energy Policy*, *95*, 411–420. [CrossRef]

WHO. (2020). *Coronavirus disease (COVID-19) pandemic*. Available online: https://iris.who.int/bitstream/handle/10665/348296/WHO-EURO-2021-1772-41523-60739-eng.pdf?sequence=1 (accessed on 15 June 2021).

Wilkerson, T. (2005, April 5). *Best practices in implementing green supply chains* [Paper presentation]. North American supply chain world conference and exposition, Anaheim, CA, USA. Available online: www.supply-chain.org/galleries/default-file/Best%20Practices%20in%20Green%20Supply%20Chain%20Management%20FINAL.pdf (accessed on 10 August 2024).

Xu, N., Huo, B., & Ye, Y. (2024). The impact of supply chain pressure on cross-functional green integration and environmental performance: An empirical study from Chinese firms. *Operations Management Research*, *17*, 612–634. [CrossRef]

Xu, S., Zhang, X., Feng, L., & Yang, W. (2020). Disruption risks in supply chain management: A literature review based on bibliometric analysis. *International Journal of Production Research*, *58*(11), 3508–3526. [CrossRef]

Yamini, Y. (2020). The impact of COVID-19 on the stock returns of companies of oil & gas industry of G7 nations. *International Journal of Management*, *11*(11), 477–488. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3747524 (accessed on 10 August 2024).

Yang, Y., Jia, F., & Xu, Z. (2019). Towards an integrated conceptual model of supply chain learning: An extended resource-based view. *Supply Chain Management: An International Journal*, *24*(2), 189–214. [CrossRef]

Yến, N. T. (2016). Chuỗi cung ứng xanh thủy sản Việt Nam: Thực trạng và giải pháp. *Tạp Chí Quản Lý và Kinh Tế Quốc Tế*, *85*(85), 35–44. Available online: https://www.thuvientailieu.vn/tai-lieu/chuoi-cung-ung-xanh-thuy-san-viet-nam-thuc-trang-va-giai-phap-65203/ (accessed on 10 July 2021).

Zhang, D., Hu, M., & Ji, Q. (2020). Financial markets under the global pandemic of COVID-19. *Finance Research Letters*, *36*, 101528. [CrossRef]

Zhu, Q., Krikke, H., & Caniëls, M. C. J. (2017). Integrated supply chain risk management: A systematic review. *The International Journal of Logistics Management*, *28*(4), 1123–1141. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.