

# Unveiling the Relationship between Voluntary Environmental Standards and Stock Market Performance: Empirical Insights from Textile Manufacturing Firms in Pakistan

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ARTICLE INFO	ABSTRACT
<p><b>Article History:</b> Received: 11 Sep, 2023 Revised: 19 Oct, 2023 Accepted: 28 Feb, 2024 Available Online: 29 Feb, 2024</p> <p><b>DOI:</b> <a href="https://doi.org/10.56536/jebv.v4i1.105">https://doi.org/10.56536/jebv.v4i1.105</a></p> <p><b>Keywords:</b> Management System, Eco-labels, Firms Performance, Voluntary Environmental Standard.</p> <p><b>JEL Classification:</b> Q54, Q57, QL25, R11</p>	<p>The primary objective of this study is to examine the impact of voluntary environmental standards, specifically EMS and eco-labels, on firms' stock market performance. To achieve this aim, fixed-effect regressions were applied using panel data from 96 textile firms listed on the Pakistan Stock Exchange between 2009 and 2022. Data were meticulously sourced from the State Bank of Pakistan (2022), annual reports of manufacturing firms, and their official websites. The findings of this study indicate a positive correlation between the adoption of EMS &amp; eco-labels, and stock market performance among manufacturing firms in Pakistan. Similarly, eco-label also helps to promote sustainable business. Similarly, EMS is also important for EPS. It is also observed that firms having eco-label has significant impact on EPS. Eco-label helps to increase sale, profitability and stock market by ensuring the sustainable production, because, customer satisfaction and loyalty increases. By adopting VES, an industry can achieved increase in profit, reduce cost, improve environmental standards and, also, increase consumer confidence. The outcomes of the study signify the importance of managerial commitment to the adoption and implementation of voluntary environmental standards within these firms.</p>

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## INTRODUCTION

The scarce and depletion of resources combined with the effects of industrialization have significantly impacted the earth's natural environment, habitats and ecosystems. Concerns regarding decline and excessive resource consumption are not novel. In the 1960s both national and international environmental organizations recognized the degradation of the environment as a pressing issue. As a result in tandem, with progress global environmental challenges have grown increasingly severe. This has led to a growing conflict between advancement and environmental preservation. The process of Eco Labelling certification aids in advancing the economy by promoting practices, in production, consumption and distribution to create goods that adhere to voluntary standards (Wojnarowska et al., 2021)

Manufacturing companies can help preserve the environment by following standards to minimize their impact on natural resources. These standards include using energy sources reducing waste and emissions implementing recycling programs adopting production processes managing hazardous materials properly utilizing ecofriendly materials and products designing products for reuse or recycling and decreasing packaging waste (UNEP, 2021). Within the industry sector there are standards like Eco labels and Environmental Management System (EMS) introduced by ISO to safeguard the natural environment from industrial pollution. Eco labels such, as ISO 14021, ISO 14024 and ISO 14025 are certifications given to products.

These are the ISO that provide the schemes, which are applied to environmentally friendly items that satisfy the requirements of eco-labels (UNOPS, 2009) An international standard for the environmental protection is known as EMS (ISO14000) assists businesses in recognizing, managing and controlling their environmental challenges holistically (International Organization for Standardization, 2020). There are three types of eco-labels including ISO type I (ISO 14024), type II (ISO 14021) and type III (ISO 14025). A third party audits the type I eco-label i.e. ISO-14025, voluntary multi-criteria eco-label, and declaration form.

Eco-labels are certifications that indicate that product are produced with a reduced environmental impact as compared to products that are produced without eco-label. These certificates are typically given by third-party organizations which are established for environmentally responsible production (Alfredo & Nurcahyo, 2018; Wojnarowska et al., 2021). While giving the certificate, this party considers the full life cycle of product and environmental protection ability. However, type II eco-label is voluntary labels which are not audited by the third party. Similarly, type III labels shows the qualitative data among buyers and it is solely based on evaluating the environmental performance of the particular product. The certificate awardee specialist may be a public and private sector organization for instance; European Union (EU) Eco-Label and German Blue Angel (International Organization for Standardization, 2022) Eco-labels can be established on a wide range of industries like food, cements and textiles etc (Manta et al., 2022). Correspondingly, for sustainable production of wood the eco-labels are “forest stewardship council” and “energy star label” are used for energy efficient appliances. The uses of eco-label are voluntary depending upon the countries and industries. However, these labels are providing valuable information to consumers about the sustainable production and consumption choices.

Additionally, companies having eco-label differentiate their products in the local and global market. Eco-label index is the largest global directory which shows that 199 countries having the eco-label i.e. 456 eco-labels, which are about to 36 percent eco-labels listed in the last decade (Ecolabel Index, 2023). ISO 14000 gave complete information and guidelines for EMS, published in 1996 by the International Organization for Standardization (ISO). This standard helps organizations to minimize the adverse impact on the environment (Lin & Bowman, 2022). The standards also provide the environmental policy, implementation and monitoring to clean the environment. By executing the EMS, firms can establish their commitment of environmental protection, and gain a competitive advantage in the global market (S. A. R. Khan et al., 2023; Težak Damijanić et al., 2023)

The voluntary standards can be used by any organization irrespective of firm's size, type time or space (International Organization for Standardization, 2022). The firms which are using EMS (ISO-14000) also take advantage of cost reduction, increase product credibility, reduce environmental risk and increase competitive advantage. However, as compared to other ISO, ISO 14001 which is established in 2015 is considered as latest version of EMS because, it puts more stress on improving the environmental performance (International Organization for Standardization, 2022).

Adopting eco-labels also increases firm's reputation among stakeholders, including customers, suppliers, investors, and the public (Latip et al., 2022). Eco-labels and EMS also used for cost savings by reducing energy consumption, waste reduction and sustainability. Thus, firms follow the environmental rules & regulations and, also avoid fines & penalties. The firms will also invest on R&D to produce more sustainable products. Thus, firms can improve relations with stakeholders by addressing sustainability produce and environment friendly production process for growing business (Pun & Hui, 2001)

Furthermore, firms must share information regarding environmental performance to expand the operational efficiency and business success. Moreover, the listed firms also published the sustainability reports along annual reports. Global stock exchanges also motivate the listed companies by launching report on sustainability goals. The objective of launching reports is enhancing the firm's performance and hence, many listed firms prefer to publish sustainable indices. The significant benefits of this act is demonstrates a real concern for the environmental friendly product to aware consumers, both domestically and abroad (Mustafa & Hera, 2017). This will help the firm to improve its reputation through environmentally responsible and socially consciousness. Hereafter, this can also lead to improve customer loyalty, improve demand, higher sale and profit as suggested by Lin & Bowman (2022) Firms with eco-labels may have lower environmental risk can positively impact their stock price (Arda et al., 2019). Eco-labels also improve its competitiveness and attract investors, ultimately, demand for the firm's shares and stock prices increases simultaneously (Zhang & Demirkan, 2021).

The empirical evidence suggested that eco-labels may have a significantly influence on firms' stock market performance. However, there are few other factors including industry, type of eco-label, and regulatory environment. Pakistan is the 6th most populous and a developing economy. The contribution of industrial sector to GDP is about 18.8 percent. Furthermore, it is also facing environmental challenges including air and water pollution, deforestation, and soil degradation. However, industrial sector seems least willing to protect the natural environment from their pollution because of additional cost occurring to protect environment. The existing literature has not thoroughly explored the impact of voluntary environmental standards on stock market performance, especially within the Asian region. Therefore, this study seeks to fill this gap and achieving this objective offering significant insights for future research in the Asian context. Unambiguously, the present study aims to analyze the effect of voluntary environmental standards on the firms' stock market performance of textile sector of Pakistan. More importantly, this study uses share price (SP),

earnings per share (EPS) and cash dividend per share (DPS) as a key indicator to measure the stock market performance.

## **LITERATURE REVIEW**

### **The Effect of Voluntary Environmental Standards on Firms' Stock Market Performance**

The study discusses the impact of VES on the stock market performance. There are many proxies that represent the voluntary environment standards; however, this study focusses on eco-labels and environmental management standards (EMS). Therefore, this study will address the impact of eco-labeling and environment management system (EMS) on stock market performance. These standards lead to enhanced customer loyalty, increased demand, resulting in higher sales and profits, which significantly affect the stock price (S. A. R. Khan et al., 2023).

### **Eco-Labels and Firms' Stock Market Performance**

Eco-labels are designed to identify and promote products that have a lower environmental impact. There is empirical evidence which explain that companies that adopt eco-labeling follows the positive effects on stock market. For instance, researcher tries to investigate the impact of eco-label on the financial performance like firm's profitability and ROE of 981 Chinese firms over the period of 2000 to 2005 (Khan et al., 2023; Wang et al., 2015). By concluding the results, they proposed that eco-label is significantly and positively associated with a firm's financial performance, higher profitability ratios. These results also coincide with (Hayat et al., 2020) Furthermore, Khan & Jehan, (2023) also suggested that there are other factors that determined the profitability and firm performance like customer loyalty and increase reputation (Mustafa & Hera, 2017). The study endorses that policymakers should use eco-labeling as a key tool to increase firm's performance, environmental performance and, also, obtain the associated financial benefits.

### **Environmental Management System and Firms' Stock Market Performance**

Although, literature of EMS on stock market performance is very limited. But still few authors try to explore the relationship are significant and few studies are also found that this relationship is biased. The effect of EMS on firm's stock market performance that firms which is adopting VES has positive significant impact on stock market performance as suggested by (Hayat et al., 2020). However, few studies found insignificant relationship between adoption of voluntary environmental standards and stock market performance (Boulatoff et al., 2013; Mollah et al., 2023). Conversely, the relationship between voluntary environmental standards and stock market performance is complex and need to fully understand (Hayat et al., 2020)

Xin & Long (2023) tries to investigate the relationship of voluntary environmental system and eco-label knowledge with corporate responsibility and capital market performance. Their findings showed the positive relationship among the pertinent variables. The results are also justified by (Riaz & Saeed, 2020). Furthermore, the ultimate benefit to involve in protecting environment is better

financial performance than other firms. Specifically, the study also emphasizes a positive relationship between adoption of VES and stock market performance. Which in return are more likely to participate in VES program, hence, can lead to improved environmental performance and improved stock market performance.

Correspondingly, Boulatoff et al. (2013) also emphasize on the relationship of voluntary environmental system and firm performance by investigating the Chicago climate exchange (CCX) and stock market performance. The study used the data of 21 manufacturing firms for the period of 2007 to 2012. It is worth noted that, CCX was also VES that allow the firms to reduce greenhouse gas and carbon omission (Težak Damijanić et al., 2023). The results suggested that all firms participating had better environmental performance. On the same token, firms whose are following the VES had strong market value and increase profitability as compare to other firms. This suggests that VES have positive effects on, environmental and financial performance. All the firms having higher environmental performance were more likely to participate in environmental protection activity and achieve greater benefits. This highlights the importance of firms for environmental attitudes and voluntary environmental regulation programs.

Gupta & Goldar (2005) also examined the stock market performance in case of using environmental friendly behavior. The study took the stock prices of 24 companies listed on the Bombay stock exchange that were known to be polluting industries during the period of 2000 to 2005. The study also observed the stock market behavior, before and after, while announcing the environmental regulations. The results found that the stock market did not correct environment-unfriendly behavior & sustainable production (Mollah et al., 2023) Surprising, the stock prices of the polluting industries increased after the announcement of environmental regulations. The study suggested that this could be happen because investors believed that the companies would be able to pass the costs to consumers (S. A. R. Khan et al., 2023; Pun & Hui, 2001; Waseem et al., 2023). Additionally, it is also found, incidents of environmental violations did not have a significant impact on stock prices (Xu et al., 2012). This also suggests that investors were not concerned about the potential liabilities that companies could face as a result of environmental violations.

*H1: The firms who adopted voluntary environmental standards grew faster than those firms who did not adopted voluntary environmental standards.*

*H2: The firms who adopted voluntary environmental standards are more efficient in production than those firms who did not adopted voluntary environmental standards.*

*H3: The firms who adopted voluntary environmental standards experience better stock market performance than those firms who did not adopted voluntary environmental standards.*

## RESEARCH METHODOLOGY

### Data and Sources

To analyse the effect of VES on firm's growth and stock market performance, this study use the panel data of 95 textiles firms listed on the Pakistan Stock Exchange (PSX) for the period from 2009 to 2022. The information regarding to Eco-labels and EMS adoption status of the firms are directly collected from the annual reports of the firms. The rest of the data will be collected from numerous sources like State Bank of Pakistan and Annual Reports of the Firms. Finally, we will collect the information regarding the environment degradation standards adoption status of the firms from their annual reports. Most of the firms under consideration to display the adoption of EMS on their official websites and in their annual reports. Similarly, there are number of firms who did not display information on their official websites or in their annual reports. However, few firms also report false information regarding the IMS adoption. Therefore, we will use third party information such as International Organization for Standardization (ISO) and will confirm the voluntary EMS adoption status of the listed firms in Pakistan.

### Theoretical background

Eco-labels and environmental management system are basically voluntary. These voluntary criteria established the basis of stock exchange performance of the manufacturing firms. The impacts of voluntary environmental standards are not altogether obvious. They affect the resource allocation of the firms that ultimately change the decision-making process of the consumers to consume eco-labeled products (Aziz & Ahmed, 2023; Toile & Koop, 2013). Moreover, VES may involve limited number of firms but adopting VES would give them an enhanced benefit to capture the domestic and foreign market. To provide theoretical background of the study we will follow the theoretical model presented by (Iraldo et al., 2009) which is also known as vertical differentiation model. We will follow the Iraldo et al. (2009) provided framework to evaluate the impact of eco-labels voluntary environmental standards (VES) and economic impact of listed manufacturing firms of Pakistan stock Exchange of the multiplication of eco-labels and EMS (Barkemeyer et al., 2023; S. A. R. Khan et al., 2023). However, they considered two cases; firstly, they assumed there is symmetrical information such that the consumers know the true environmental qualities of voluntary environmental standards. While in second case, they assumed that the asymmetrical information such that the consumers do not know the true environmental qualities of voluntary environmental standards produced by the firms. We extend our model under two cases and evaluate the firm's growth, efficiency, and stock market performance of the textile firms having VES standards and having non-VES standards.

The model will be based on the case of complete consumer information such that the entire consumer perfectly knows the high environmental quality  $q^H$  and the low environmental quality  $q^L$ . The profit of Firm H and Firm L is given by:

Profit = Total Revenue – Total Cost

Equation A

$$\pi^H(p^H, p^L, q^H, q^L) = p^H, D^H(p^H, p^L, q^H, q^L) - \alpha q^{H^2}$$

Equation B

$$\pi^L(p^L, p^H, q^L, q^H) = p^L, D^L(p^L, p^H, q^L, q^H) - \gamma \alpha q^{L^2}$$

Equation C

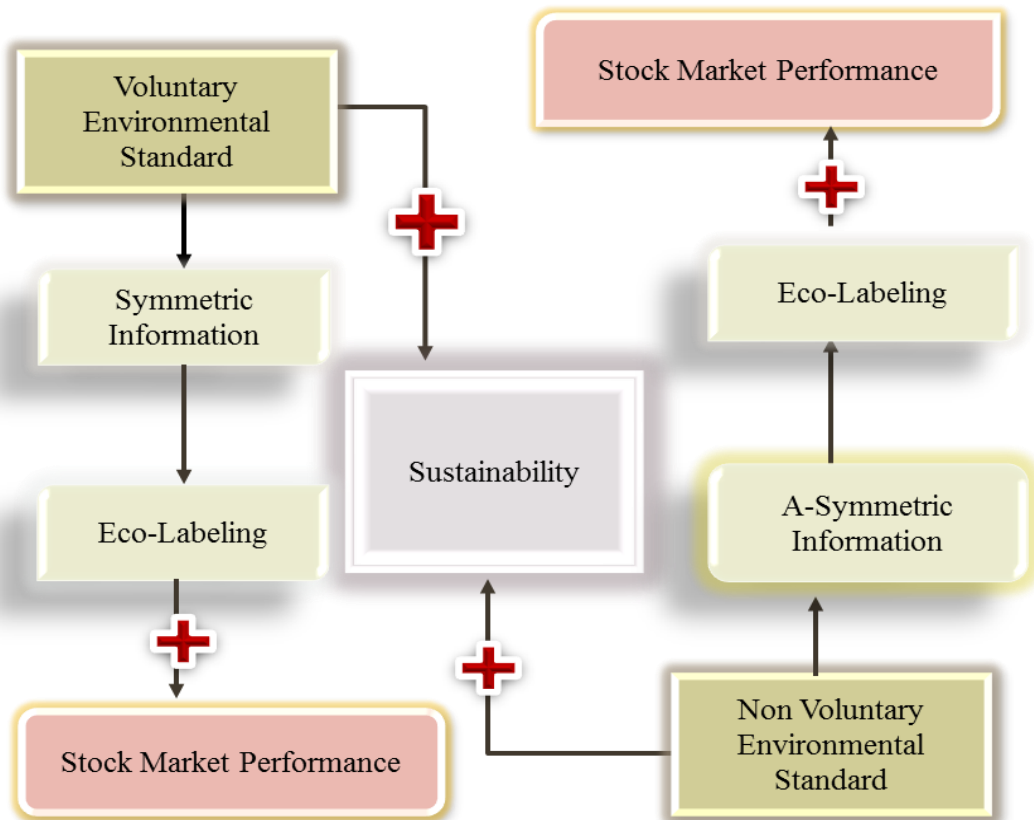


Figure 1. Flow Chart of Theoretical Framework

We will develop a model where all consumers are able to know perfectly the environmental qualities  $q^L$  and  $q^H$ : The game is like the followings: in the first step, firms H and L with eco-labels  $L_H$  and  $L_L$  compete in the environmental qualities. In the second stage, the two firms compete in prices. In the third stage, the consumer chooses to buy the good H or L or not to buy. The aim of this section is to understand the effective impacts of two different eco-labels on the environmental qualities when the consumers know perfectly the quality levels (Ikram et al., 2019). Since we investigate the effect of eco-label and EMS adoption by the manufacturing firms; we devise two groups of manufacturing firms, one with an eco-label and EMS and the second without an eco-label and EMS (Ahmad et al., 2021). On the relationship among the effect of eco-label and EMS adoption by the manufacturing firms on stock market performance, this model will provide information that in the existence of both

ecolabeling and EMS adoption how and why one firm enable both the firms to charge higher prices and to generate higher revenue and profits.

### Empirical Methods

#### Precautionary tests

Before delving into the empirical estimation of the results our study underwent rigorous precautionary tests to comprehensively understand the fundamental characteristics of the data. This approach allowed us to select the most appropriate econometric techniques tailored to the specific attributes of the data, ensuring the reliability and accuracy of our estimates.

#### Panel Heterogeneity Test

This Panel heterogeneity is particularly present in longitudinal datasets refers which shows the relationship between independent and dependent variables. Since, data of multiple firms are collected of over the period of time; that’s way this problem is present in panel dataset. The present study used Tilde and Adjusted Tilde tests to detect this problem. These results provide the robust results and significantly capturing the heterogeneity. The econometric equations of these tests are stated as follows:

$$\text{Tilde (Delta): } \Delta_{sch} = (M^{1/2})(2K^{-1/2}) + \left(\frac{1}{M}V - K\right) \tag{1}$$

$$\text{Adjusted tilde (Delta): } \Delta_{asch} = (M^{1/2}) \left(\frac{2k(T-k-1)}{T+1}\right)^{-1/2} + \left(\frac{1}{M}V - 2K\right) \tag{2}$$

#### Cross sectional dependency Test

Cross-sectional dependency (CSD) also present in panel data set which indicate that observations across different entities within a panel dataset are correlated. The presence of CSD can misrepresent the results and hence, remove CSD is a crucial task. There are numerous techniques including Bruesch-Pagan LM test and the Pesaran CD test are used to detect CSD also provide robust results. The econometric specification of these tests is stated as follows:

$$\text{Breusch-Pagan LM: } LM = T \sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\rho}_{i,j}^2 \tag{3}$$

$$\text{Pesaran CD: } CD = \sqrt{\frac{2T}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N \hat{\rho}_{i,j} \tag{4}$$



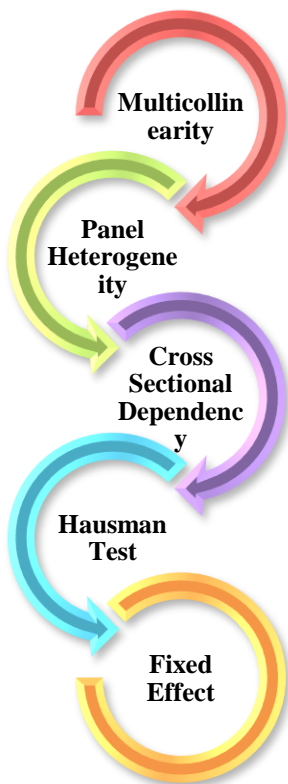


Figure 2. Methodology Framework

**Hypothesis Testing Technique**

The present study employed a fixed effect regression model to test the hypothesized relation among the modelled variables, and subsequently formulates the following econometric models in order to achieve the proposed study objectives ((Bai et al., 2023)).

$$SP_{it} = \alpha_i + \lambda_t + \alpha_1 DECO_{it} + \alpha_2 DEMS_{it} + \alpha_3 W_{it} + \mu_{it5} \tag{5}$$

$$EPS_{it} = \beta_i + \lambda_t + \beta_1 DECO_{it} + \beta_2 DEMS_{it} + \beta_3 W_{it} + \mu_{it6} \tag{6}$$

$$DPS_{it} = \gamma_i + \lambda_t + \gamma_1 DECO_{it} + \gamma_2 DEMS_{it} + \gamma_3 W_{it} + \mu_{it7} \tag{7}$$

$$i = 1, \dots, N, \quad t = 1, \dots, T$$

where  $SP_{it}$  shows share price of the  $it$ th firm in time  $t$ ,  $EPS_{it}$  shows earning per share of the  $it$ th firm in time  $t$ , and  $DPS_{it}$  shows dividend per share of the  $it$ th firm in time  $t$ ,  $DECO_{it}$  is an independent dummy variable that represents 1 if the firm is eco-label certified and 0 if the firm is not eco-label certified,  $DEMS_{it}$  is an independent dummy variable that represents 1 if the firm is EMS certified and 0 if the firm is not EMS certified,  $W_{it}$  are the set of time-variant independent variables that effect the SP, EPS and DPS,  $\mu_{it5}$ ,  $\mu_{it6}$ , and  $\mu_{it7}$  are the disturbance terms. The parameters  $\lambda_t$

represents the time/year effect and replicates omitted variables which effect the *ith* firm in time period *t*.

It is worth mentioning that we have opted to employ the fixed effect model, recognizing its robustness against the challenges posed by CSD and panel heterogeneity. Panel datasets, commonly encountered in our research context where observations are gathered over time for multiple entities, often exhibit correlations among entities (CSD) and variations in individual entity effects (panel heterogeneity). The FEM is considered as best technique to capture the issue, as it controls for unobserved heterogeneity. In our analysis, firstly, we considered both random and fixed effect models. However, later on, we used Hausman test. The Hausman test can be used to compares the random and fixed effect models and suggesting that appropriate model. Ultimately this will enhance the accuracy and reliability of our findings and contributing in investigating the relationship between variables.

## RESULT AND DISCUSSION

### Correlation Matrix

We start our estimation process with a series of diagnostic and precautionary tests. To begin with the issue of multicollinearity, we have employed correlation matrix to diagnose the potential issue of multicollinearity among our modelled variables (Bukhari et al., 2023). The outcomes of correlation matrix are documented in table 1, which unveils that the issue of multicollinearity is not a serious concern in our data as the coefficient of correlation between explanatory variables does not exceed 0.85 (Ahmed et al., 2022).

The interesting aspects of our findings are that the DECO displayed a moderate positive correlation with SP (0.528), EPS (0.684) and DPS (0.547). Similarly, DEMS displayed a strong positive correlation with SP (0.785), EPS (0.674), and DPS (0.776), which suggests the potential influence of sustainability initiatives on market valuation or stock market performance. However, to strengthen our assertions, we intend to complement these findings with regression analysis.

**Table I: Correlation Matrix**

	DECO	DEMS	AGE	SIZE	DEBT	MTB	ADV	AG	SP	EPS	DPS
DECO	1										
DEMS	0.156	1									
AGE	0.146	0.163	1								
SIZE	0.284	0.184	0.354	1							
DEBT	0.263	0.372	0.118	0.274	1						
MTB	0.284	0.285	0.276	0.294	0.210	1					
ADV	0.276	0.453	0.154	0.176	0.282	0.276	1				
AG	0.327	0.265	0.375	0.392	0.424	0.174	0.254	1			
SP	0.528	0.785	0.363	0.374	0.276	0.228	0.135	0.564	1		
EPS	0.684	0.674	0.237	0.329	0.463	0.582	0.345	0.253	0.284	1	
DPS	0.547	0.776	0.274	0.274	0.274	0.624	0.256	0.354	0.228	0.538	1

Where: DECO is DECO is dummy variable that represents 1 if the firm is eco-label certified, and 0 otherwise. DEMS is also a dummy variable that represents 1 if firm is environmental management system certified, and 0 otherwise. AGE is firm age, SIZE is firm size,

DEBT is firm debt, MTB is market to book ratio, ADV is advertisement, AG is asset growth, SP is share price, EPS is earning per share, DPS is dividend per share.

### Panel Heterogeneity

After confirming that our data is free from the issue of multicollinearity, we move forward panel heterogeneity tests. We have utilized two widely employed tests, such as Tilde (with delta), and Adjusted Tilde (with delta) to test whether our panel data set are homogenous or heterogenous, with outcomes are reported in table 2. The significant test statistics of Tilde, and Adjusted Tilde suggest the presence of heterogeneity within our panel dataset.

**Table II: Panel Heterogeneity**

Variables	Tilde (with delta)	Adjusted Tilde (with delta)
DECO	6.345***	7.485***
DEMS	7.387**	8.036***
AGE	5.754**	9.345***
SIZE	9.375***	6.378***
DEBT	5.782**	7.943***
MTB	4.926**	5.883**
ADV	8.735***	4.092**
AG	9.204***	8.349***
SP	8.835***	9.037***
EPS	5.838**	7.935***
DPS	6.535***	6.229**

Note: where \*\* and \*\*\* shows the significance of results at 5% and 1%, respectively.

### Cross Sectional Dependency (CSD)

The presence of heterogeneity among the panel data sets also signposts the presence of cross-sectional dependency. To empirically confirm this, we relied on two widely used tests: the Breusch-Pagan LM and Pesaran CD tests, with results are reported in table 3. Both tests detect the problem of CSD under the null hypothesis of “cross-sectional independence” ((Kousar et al., 2020)). The significance of the test statistics from both the Breusch-Pagan LM and Pesaran CD tests indicates the presence of CSD within the panel datasets.

**Table III: Cross Sectional Dependency**

Variables	Breusch Pagan LM	Pesaran CD
DECO	12.783***	9.277***
DEMS	11.875***	10.374***
AGE	9.384***	11.283***
SIZE	10.863***	9.273***
DEBT	11.836***	7.935***
MTB	9.107***	10.229***
ADV	7.937***	11.936***
AG	9.297***	9.783***
SP	12.855***	7.347***
EPS	11.948***	8.273***
DPS	4.289***	9.222***

Note: where \*\* and \*\*\* shows the significance of results at 5% and 1%, respectively.

### Fixed Regression Estimations

Finally, the last step of our estimations involves the estimation of empirical results through regression analysis. We conducted three iterations of our model to ensure robustness in assessing the impact of sustainability initiatives (i.e., DECO and DEMS) on stock market performance. Stock market performance is measured using SP in model 1 and EPS and DPS in models 2 and 3, respectively. Given the econometric properties of our data sets, we have chosen to proceed with the random effect and fixed effect models. Notably, we took the support from the Hausman test to decide which tests best fit to our estimates, with results are reported in panel B of table 4. The significant test statistic of Chi-square suggests that employing fixed effect model will provide more efficient results. Therefore, we have proceeds with fixed effect model to interpret the findings, with results are reported in panel A of table 4.

Upon examining the regression results, the positive impact of eco-label certification (DECO) across all three models becomes evident. In Model 1, the significant coefficient of DECO i.e. 1.84 shows a positive relationship between eco-label and SP. This finding suggests that investors using the eco-label because of sustainable business practices imposed by institutions (Sun et al., 2021).

In Model 2, the coefficient value of DECO (1.9) indicates similar results like model 1. That shows a positive relationship between eco-label certification and EPS. This implies that firms having eco-label more likely to increase profitability by cost savings and increased consumer expectation (Wang et al., 2015). Similarly, in Model 3, the coefficient of DECO (1.883) directs a significant positive relationship of eco-label and DPS. This explain, firms using eco-label are considered as financially stable, this can increased shareholder returns by giving higher dividend (Dey et al., 2020; Hayat et al., 2020; Krah et al., 2019; Wen & Lee, 2020). Firstly, eco-label signals a firm's obligation to provide sustainable business and environmental friendly production and resilience for environmental risks (Mollah et al., 2023). Secondly, eco-label also enhances a firm's reputation in the global market which, ultimately, increases the market differentiation, revenue growth and profitability (Hayat et al., 2020). Moreover, eco-label certified firms tend also tries to mitigate environmental, which also increase the financial stability and resilience (Riaz & Saeed, 2020). Additionally, eco-label also helps the firm's access in a global market, enhance capital by attracting global market (Asif et al., 2023). Lastly, consumer awareness also create new opportunities for firms to increase revenue growth and profitability (Dudinskaya et al., 2023; Težak Damijanić et al., 2023). In short, eco-label enhances investor confidence, consumer confidence and firm's reputation, which will help the non-financial firms to increase profit, EPS and DPS (Mustafa & Hera, 2017).

Similarly, EMS certification also exhibits a strong positive impact on stock market performance across all models. In Model 1, the coefficient of DEMS (1.836) indicates a strong positive relationship between EMS and SP (S. A. R. Khan et al., 2023). This explain that firms with EMS certification are valued more by stakeholder i.e. shareholder, consumer and investor. In Model 2, the coefficient values also suggest the positive significant relationship between EMS and EPS. This indicates that all the firms using EMS are achieving higher profit and production process (Pun & Hui 2001). Moreover, Model 3, the coefficient value i.e. 1.7 of EMS indicates the positive impact of

EMS on DPS. This also explains that certified firms distribute higher dividends to shareholders which increase the shareholders confidence on firm. There are several factors for distributing more DPS, however, this increase the firm's credibility and sustainability. Additionally, EMS certification also helps in risk mitigation strategy, which enhances investor confidence in the firm's financial stability and resilience (Hayat et al., 2020). This accountability contributes the market's confidence in local and foreign markets. Overall, EMS certified firms can build more confidence, financial stability and sustainability which helps the companies to increase profit and compete in the market in long-run. Hence, the outcome of the study supports the hypothesized relationship among the modeled variables.

**Table IV: Fixed Effect Regression Model**

Panel A						
Fixed Effect Model						
Variables	Model 1 = SP		Model 2 = EPS		Model 3 = DPS	
	Coeff	P-value	Coeff	P-value	Coeff	P-value
DECO	1.833**	0.000	1.936***	0.000	1.883***	0.000
DEMS	1.836***	0.000	1.745***	0.000	1.735***	0.001
AGE	1.273***	0.002	1.378**	0.024	1.624**	0.036
SIZE	1.354**	0.025	1.479***	0.000	1.364***	0.007
DEBT	-0.723***	0.000	-0.635***	0.000	-1.213***	0.004
MTB	1.723**	0.028	1.0364***	0.004	0.826**	0.024
ADV	0.625**	0.045	1.119***	0.000	0.544*	0.074
AG	1.634***	0.003	1.342**	0.033	1.291***	0.000
R-Sqr	0.8364		0.8946		0.8475	
Adj R-Sqr	0.8183		0.8836		0.8264	

Panel B			
Hausman Test			
Chi-Square	27.264***		18.378***
P-Value	0.000		0.000
Decision	"Fixed Effect Model"		"Fixed Effect Model"

Where: DECO is DECO is dummy variable that represents 1 if the firm is eco-label certified, and 0 otherwise. DEMS is also a dummy variable that represents 1 if firm is environmental management system certified, and 0 otherwise. AGE is firm age, SIZE is firm size, DEBT is firm debt, MTB is market to book ratio, ADV is advertisement, AG is asset growth, SP is share price, EPS is earning per share, DPS is dividend per share, \*\* and \*\*\* shows the significance of results at 5% and 1%, respectively.

## CONCLUSION AND POLICY IMPLEMENTATION

### Conclusion

In conclusion, this research explains the pivotal role of Eco-labels and EMS on stock market performance. The studies explores that how VES like Eco-labels and EMS can be helpful for reducing environmental degradation, increase firm's profitability and also improve stock market performance.

This study also highlights that by adopting VES, it not only improves environment sustainability but also leads to competitive advantages in global market by reducing cost and increase confidence. In this research, examining the impact of voluntary environmental standards on stock market performance by sing the panel data of textile firms listed on Pakistan stock exchange. The findings provide guidance that how investors can get benefit from incorporating VES into their investment

decisions, because it provides superior financial benefits on firms return. The result reveals that eco-label has significantly increased the SP. This indicates that firms which are using eco-label can get more consumer confidence, which will ultimately increase profitability, and sustainability. Correspondingly, model 2 also explains a positive relationship between eco-label and EPS. The EPS is directly linked with the firm's profitability, because, when profit increases then this profit ultimately distributed between shareholders. Hence, this study reveals that as the EPS is also directly affected by the adoption of EMS. Likewise, model 3, also confirms a positive impact of eco-labeling on DPS. Hence, we can conclude that, eco-labeling plays an important role for the firms' productivity and eco-friendly product. The adoption of labeling increase firms' sustainable production, profitability, also increases SP, EPS and DPS.

### **Practical Implications**

Based on the research findings, policy recommendations are also proposed in the way that EMS and Eco-labels can enhance stock market performance in Pakistan. Hence, regulatory authorities and government play an active role to encourage firms to adopt VEM in the manufacturing sector to raise profitability and competitiveness. Ultimately, sustainable growth, environmental protection and stock market performance will increase, that will helpful for manufacturing sector to grow faster in global market. Furthermore, it is a core responsibility, government should encourage the industries by providing incentive, subsidies and, also, imposing fine. The adoption of VEM is costly procedure for firms and firms tries to avoid the costly activities. However, by imposing government restriction such as providing incentive and imposing fine, the firms adopt the management system. This will lead to increase sustainability and also increasing environment health. Similarly, government should provide resources for R&D, this may help the firms to enhance productivity by following management standards. Lastly, it is also the responsibility of government to provide educational awareness to the stakeholders. This awareness will lead to increase firms' performance, growth and sustainable production.

*Note: (This research article is derived from the doctoral thesis titled "Unveiling the Relationship between Voluntary Environmental Standards and Stock Market Performance: Empirical Insights from Listed Firms in Pakistan," authored by Azaz Ali Ather Bukhari supervised by Dr. Naveed Hayat)*

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