A Structural Equation Model of Leadership, Technology Acceptance Model, Organizational Policies, and ESG Score Improvement Affecting the Performance of Listed Companies in Thailand Stock Exchange

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Abstract

The purpose of this research was to study the factors that contribute to the development of a structural equation model affecting ESG and impacting the efficiency of companies in the Stock Exchange of Thailand. The structural equation modeling process will be utilized as a tool for analysis and hypothesis testing. The population for this study comprises managerial personnel or those involved in the management and monitoring of organizational operations, representing each company in the stock market. Data will be collected using questionnaires, with a total sample size of 400 individuals.

The research found that A Structural Equation Model congruent with the observational data, as evidenced by the following fit indices: CMIN/df = 3.189, GFI = 0.92, NFI = 0.934, RFI = 0.914, IFI = 0.954, TLI = 0.939, CFI = 0.954, RMSEA = 0.074. The hypothesis testing results indicate that the leadership variable, technology acceptance variable, and organizational policy variable have a statistically significant positive direct influence on the development and enhancement of ESG scores and the organizational performance of companies listed on the Stock Exchange of Thailand at a significance level of 0.01.

Keywords: A Structural Equation Model of Leadership, TAM, Organizational Policies, ESG, Organizational Efficiency

Introduction

The Stock Exchange of Thailand comprises a large number of securities from numerous public limited companies, totaling up to 913 companies (March 21, 2023, according to the Stock Exchange of Thailand). Therefore, enhancing the nation's well-being through corporate

social responsibility (CSR) initiatives, which organizations actively participate in and prioritize as part of their policies, is expected to have a significant correlation with the national economy and environment at the regional level. (Gillan et al., 2021)

In a constantly evolving business, traditional indicators such as profit, market share, and growth rate, even if they are still important, may not provide a comprehensive overview of a company's health and opportunities. This is because there is an increasing awareness of the fragile state of the world's environment, social changes, and growing demand for transparency in governance. An enhanced understanding of business assessment, therefore, encompasses the reflection of these three dimensions factors: Environment, Social, and Governance or "ESG". This perspective recognizes that a company's performance and prospects are influenced not only by financial metrics but also by its impact on the environment, its relationships with society, and the quality of its governance practices. As a result, ESG considerations have gained traction in all three directions, emphasizing the importance of sustainable business practices that consider not only financial returns but also broader societal and environmental impacts.

ESG is often discussed in investment meetings or receives increasing attention from investors, it starts with an expansive idea of sustainable development. This concept emphasizes the interconnectedness of economic progress, environmental conservation, and social justice since the 20th century. (Brundtland et al., 1987) Over the last ten years, there has been a significant surge in the significance of non-financial indicators in ascertaining the externally targeted and proportionate worth of a corporation. This is a result of growing demands from important stakeholders and investors for growth that is sustainable and responsible. The necessity to demonstrate that the company needs to implement suitable ESG policies. (Friede, Busch, & Bassen, 2015) The emergence of ESG as a metric has influenced business evaluations from a global perspective with deeper insights. In the past, businesses often operated within the framework of stakeholders, focusing primarily on short-term profits. Expanding this perspective to include environmental and social responsibilities, along with transparent governance, signifies a shift from a stakeholder-centric view towards sustainable societal care for the future.

The significance of ESG metrics in organizational strategy evaluation is now widely acknowledged. Companies that practice stable ESG behaviors tend to reap financial benefits and exhibit greater resilience to market fluctuations compared to those that do not. This

observation confirms that responsible business practices and profitability are not contradictory but rather often aligned.

Implementing ESG is not only about fostering social and environmental responsibility within a business but also serves as a tool to enhance its value. This is because investors and consumers tend to favor businesses with strong ESG management practices. They believe in the sustainability and responsibility of these companies, which can lead to increased value. (Grewal & Serafeim, 2018)

Based on Huang' said in 2021, research studies collecting data from various companies have confirmed the significant influence of ESG variables on organizational success, as measured by organizational performance. Therefore, it is interesting to explore the antecedent factors that impact the improvement of ESG scores. These factors can provide valuable insights for managers and stakeholders to design strategies to further enhance the organization's ESG levels.

Based on the above reasons, researchers have become interested in analyzing the factors and causes of changes in ESG scores. They have reviewed additional literature and found that variables related to leadership, the level of leadership, the technology acceptance model (TAM), and organizational policies that make the researcher interested to study and conduct the model of “A Structural Equation Model of Leadership, Technology Acceptance Model, Organizational Policies, and ESG Score Improvement Affecting the Performance of Listed Companies in Thailand Stock Exchange” for the executive or related persons it could taking a structural equation model as a reference, organizations can utilize it as a guideline to enhance their ESG (Environmental, Social, and Governance) scores to a significantly higher level and sustainably impact their overall organizational performance.

Research Objectives

1. To study the level of variables of leadership, variables of TAM, variables of organization policy, variables of ESG score, and variables of Organization Effectiveness of the Performance of Listed Companies in the Thailand Stock Exchange

2. To study the influence of variables of leadership, variables of TAM, variables of organizational policy, variables of ESG score, and variables of Organization Effectiveness of the Performance of Listed Companies in the Thailand Stock Exchange

3. To create a model of the Effectiveness of the Performance of Listed Companies in the Thailand Stock Exchange.

Research Hypothesis

Hypothesis 1: Leadership variables have a direct positive influence on ESG score factors.

Hypothesis 2: Leadership variables have a direct positive influence on organizational performance.

Hypothesis 3: ESG score factors have a direct positive influence on organizational performance.

Hypothesis 4: The factor of technology acceptance model positively influences the efficiency of the organization.

Hypothesis 5: The factor of technology acceptance model positively influences the ESG (Environmental, Social, and Governance) score.

Hypothesis 6: Organizational policies have a direct positive impact on ESG scores.

Hypothesis 7: Organizational policies have a direct positive impact on organizational efficiency.

Literature Review

Grewal and Serafeim, 2018 said that the ESG (Environment, Social, and Governance) variables are metrics used to assess the performance and sustainability of businesses or organizations in the areas of Environment, Social responsibility, and Governance. These metrics are highly significant in today's business as they impact business operations and influence investor trust and overall societal perception. Engaging in ESG practices is a critical trend in contemporary business management as it contributes to the sustainable development of businesses and communities directly. However, ESG initiatives must be proactive and entail continuous responsibility within the organization to improve and develop consistently. This will positively impact the long-term trust and success of the business.

Research on literature related to leadership variables typically focuses on organizational performance, emphasizing the impact of leadership on organizational outcomes. While studies often examine leadership qualities and behaviors, they may not delve deeply into the downstream effects of higher levels of leadership variables on other variables (Akram et al., 2020; Allameh et al., 2018) Niu et al.'s 2022 literature study on it was discovered that there is a statistically significant positive association between leadership and the scores of ESG indicators. Factors that greatly affect ESG (environment, social, and governance) characteristics in organizations are referred to as "leadership" factors. Having

leaders who understand and are committed to creating and improving the environment, society, and good governance can significantly impact the success of business operations in a trustworthy manner. (Meyer et al., 2019; Waldman & Galvin, 2018)

The findings from Jin and colleagues' literature in 2023, along with Zhang's work in the same year, which studied and analyzed the relationship between the influence of leadership variables and ESG scores, enable researchers to hypothesize that

Methodology

The population of this research is managerial personnel or those involved in the management and monitoring of organizational operations, representing each company in the stock market. The researcher used Quota Sampling to define the characteristics of the business model for each company and then the researcher used Convenience Sampling from within each business group, ensuring representation from every business category. The tool used for data collection is a questionnaire, collecting data from a total of 400 individuals. Additionally, 20 extra data points are collected as a precaution against incomplete or lost data, totaling 420 individuals. The sample size for this study is set at 400 individuals to align with the recommendation by Hair et al. (2010), which suggests a suitable sample size ranging from 200 to 400 samples. This adheres to Nutthaya Pattharapisetwong (2014), who stated the appropriate sample size for structural equation modeling analysis.

This research is a quantitative study conducted by collecting data from secondary sources through a literature review, including concepts, theories, documents, and related research works. Primary data is collected using a questionnaire as a tool, followed by statistical analysis using statistical software for social science research. Statistical techniques such as descriptive statistics are employed to describe the data, along with inferential statistics, including Confirmatory Factor Analysis (CFA), to analyze all variables within the conceptual framework of this research. Path Analysis is utilized to test hypotheses and explain the direct and indirect influences of variables.

The research tool used is a questionnaire, developed through the exploration of textbooks and relevant literature related to the research topic. The questionnaire consists of closed-ended questions, divided into two parts

Part 1: General information of the respondents in the questionnaire includes demographic data, serving as population characteristics for this research.

Part 2: focuses on the levels of variables including leadership, TAM variable, corporate variable, policy variable, ESG score variable, and organizational effectiveness variable of companies in the Stock Exchange of Thailand market.

The Cronbach's alpha approach was used to assess the reliability and content validity of the research tool. The test results indicate that the average value of each observed variable has a coefficient alpha greater than 0.70. Specifically, each variable has the following alpha values: Leadership variable with a coefficient of 0.722, TAM variable with a coefficient of 0.884, Corporate Policy variable with a coefficient of 0.831, ESG Improvement variable with a coefficient of 0.887, and Organization Effectiveness variable with a coefficient of 0.839. All these values exceed the reliability threshold, indicating that the tool is reliable and suitable for collecting real data. (Pallant, 2007).

Results

The sample group consists of males, totaling 273 individuals, which accounts for 68.25%. Regarding age, 232 individuals fall within the range of 31 to 50 years old, representing 58% of the sample. Additionally, 198 individuals are single, comprising 49.5% of the sample. Furthermore, a significant portion of the sample, 192 individuals, have been with their current organization for less than 10 years, accounting for 21.75%. The researcher tested the measurement model using Confirmatory Factor Analysis (CFA) to examine the validity and reliability of the measures. The results of the confirmatory factor analysis involved examining the relationships between variables, which were initially observed through the factor loadings in the measurement model. This process is illustrated in Figure 1.

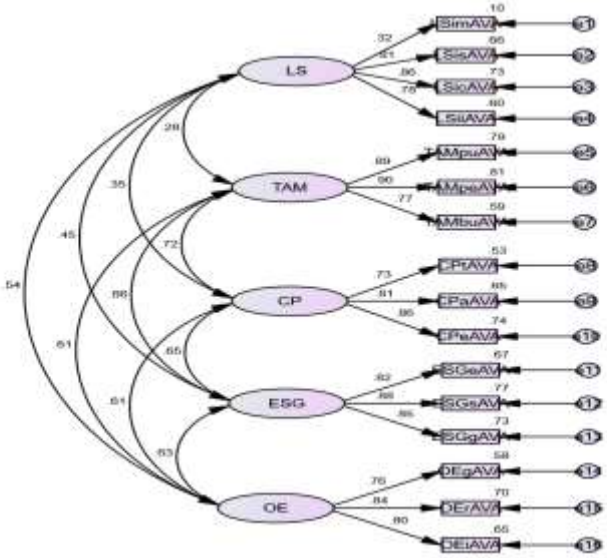

Figure 1 The analysis Measurement Model

From the analysis of the measurement model, it was revealed that the relationships within the observed variables in each model have factor loadings higher than the relationships among the latent variables used in this research study

Moreover, the researcher analyzed in factor loading found that in that case, it was found that the factor loadings of the observed variables were below the threshold. The researcher proceeded to remove those variables and conducted another round of analysis. As a result, the characteristics of the measurement model after the adjustment are as depicted in Figure 2

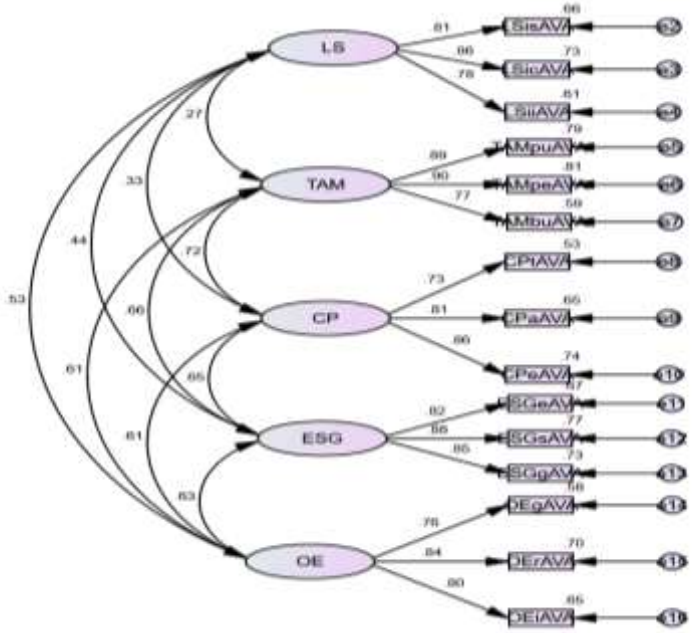

Figure 2 The revised measurement model after adjustments.

After conducting the analysis on the new measurement model, it was found that all observed variables have factor loadings greater than 0.7. Upon examining the goodness of fit, it was observed that the model fits the empirical data well and exhibits a perfect fit, without needing to consider adding relationships using the Modification Index (MI). The model's goodness of fit with the empirical data is as follows: CMIN/df = 3.189, GFI = 0.92, NFI = 0.934, RFI = 0.914, IFI = 0.954, TLI = 0.939, CFI = 0.954, RMSEA = 0.074. It is noted that some values exceed the thresholds set by Hair et al. (2010) but are within acceptable ranges.

The researcher conducted tests to assess the validity and reliability of the revised main measurement model. They removed observed variables with factor loadings below the threshold. Subsequently, the researcher employed various techniques to assess the structural

validity, including tests for construct reliability, measurement invariance, discriminant validity, and congruence with empirical data.

The researcher evaluated the construct reliability using the Composite Reliability (CR) coefficient, referencing the literature by Fornell and Larker (1981). They utilized the remaining observed variables from the measurement model test, totaling 15 variables, as shown in Table 1.

Table 1 showing the extracted variance explained, composite reliability coefficients, and structural reliability test results

Latent Variables	Number of Observed Variables	Construct Reliability	AVE
LS	3	0.858	0.686
TAM	3	0.891	0.732
CP	3	0.837	0.633
ESG	3	0.887	0.723
OE	3	0.842	0.641

It can be observed that the construct reliability coefficients for all latent variables are above 0.60. Therefore, it can be concluded that each latent variable can adequately explain the measurement of the set of observed variables according to the measurement model constructed by the researcher (Diamantopoulos and Siguaw, 2000: 90-91 และ Saarani and Shahadan, 2012) The researcher conducted a test of convergent validity using the Average Variance Extracted (AVE) analysis. From the table, it can be observed that the AVE values for each latent variable are all above 0.50. This indicates sufficient accuracy in measuring the variables, according to the established criterion (Fornell and Larcker, 1981)

The results of the discriminant validity test, following the criteria established by Fornell and Larcher (1981), indicate that the square root of the average variance extracted for each variable is greater than the pairwise correlation coefficients between each latent variable and the other latent variables in the model. Therefore, it is considered to have sufficient discriminant validity (Hair et al., 2014). The lowest square root of the average variance extracted value is 0.796, indicating reasonably high discriminant validity. The goodness of fit indices indicate that the model fits the data adequately. The values are as follows: CMIN/df = 3.318, which is less than 5 (Loo and Thorpe, 200) GFI = 0.919, which is greater than 0.80 NFI

= 0.932, which is greater than or equal to 0.9 (Bentler, 1999) IFI = 0.951, which is greater than or equal to 0.9 (Bentler, 1999) TLI = 0.935, which is greater than or equal to 0.9 (Bentler, 1999) CFI = 0.951, which is greater than or equal to 0.9 (Bentler, 1999) RMSEA = 0.076, which is less than or equal to 0.08 (Hair et al., 1998).

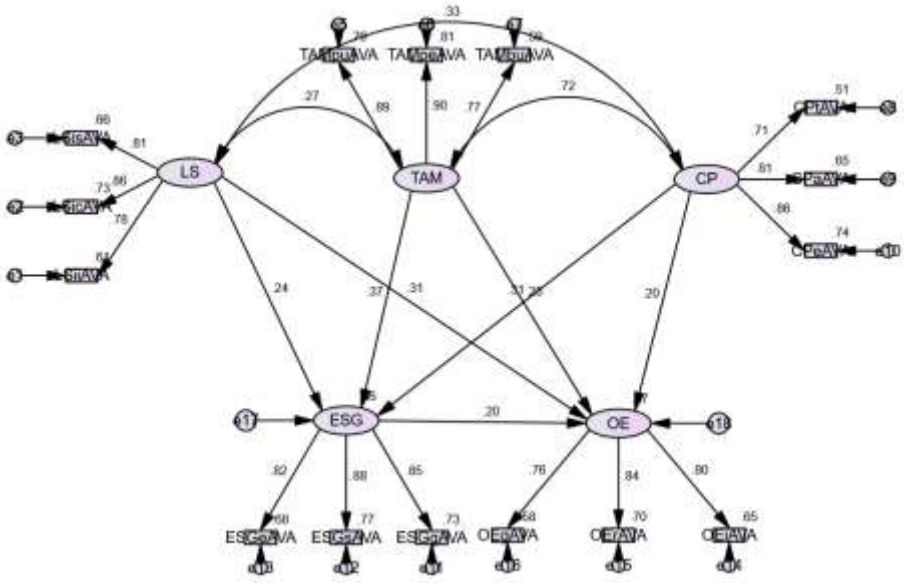

Figure 3 Showing the structural equation model analyzed in the research study

It can be observed that in the initial analysis of the structural relationships, the program detected collinearity issues among the LS, TAM, and CP variables. The researcher addressed this by drawing relationships between all three variables, as recommended by the program's suggestions. This allowed for the analysis and depiction of the structural equation model, as shown in Figure 4.

The results of hypothesis testing indicate the following: Hypothesis 1: "The leadership variable has a positive direct influence on the development and improvement of ESG scores of companies in the Stock Exchange of Thailand." The test results show statistical significance at the 0.01 level (p-value < 0.001) with a factor weight of 0.24. Hypothesis 2: "The leadership variable has a positive direct influence on the organizational effectiveness of companies in the Stock Exchange of Thailand." The test results show statistical significance at the 0.01 level (p-value < 0.001) with a factor weight of 0.31. Hypothesis 3: "The technology acceptance variable has a positive direct influence on the development and improvement of ESG scores of companies in the Stock Exchange of Thailand." The test results show statistical significance at the 0.01 level (p-value < 0.001) with a factor weight of 0.37. Hypothesis 4: "The technology acceptance variable has a positive direct influence on the organizational effectiveness of

companies in the Stock Exchange of Thailand." The test results show statistical significance at the 0.01 level (p-value < 0.001) with a factor weight of 0.25. Hypothesis 5: "Corporate policies have a positive direct influence on the development and improvement of ESG scores of companies in the Stock Exchange of Thailand." The test results show statistical significance at the 0.01 level (p-value < 0.001) with a factor weight of 0.31. Hypothesis 6: "Corporate policies have a positive direct influence on the organizational effectiveness of companies in the Stock Exchange of Thailand." The test results show statistical significance at the 0.01 level (p-value = 0.009) with a factor weight of 0.20. Hypothesis 7: "Developing and improving ESG scores have a positive direct influence on the organizational effectiveness of companies in the Stock Exchange of Thailand." The test results show statistical significance at the 0.01 level (p-value = 0.006) with a factor weight of 0.20.

The researcher analyzed the path coefficients to examine the influence of each factor. This analysis separated the effects into direct, indirect, and total effects. Additionally, the researcher presented the coefficient of determination (R-square) for each independent variable to explain the variance of the dependent variables. The results of the analysis are presented in Table 2.

Table 2 Showing The analysis of the path coefficients examines the relationships between variables in the structural equation model (Path Analysis)

Path Analysis	Direct Effect	Indirect Effect	Total Effect
LS -> ESG	0.238	-	0.238
LS -> OE	0.308	0.047	0.355
TAM -> ESG	0.375	-	0.375
TAM -> OE	0.250	0.075	0.325
CP -> ESG	0.310	-	0.310
CP -> OE	0.203	0.062	0.265
ESG -> OE	0.199	-	0.199

From the statistical analysis to test the hypotheses according to the research framework created by the researchers, the structural equation model of this study was obtained, as shown in Figure 4

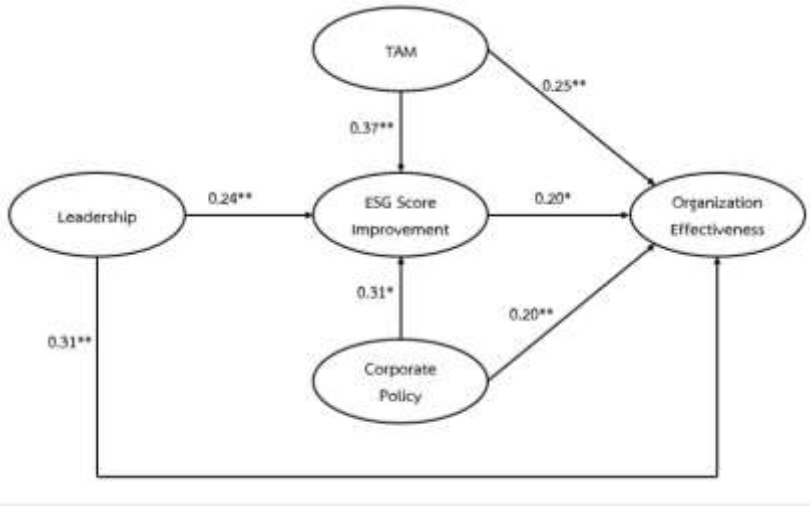

Figure 4 A Structural Equation Model of Leadership, Technology Acceptance, Organizational Policies, and ESG Score Improvement Affecting the Performance of Listed Companies in Thailand Stock Exchange

Discussion

The research findings indicate that leadership has a direct positive influence on the development and improvement of ESG scores among companies in the Thai stock market, as well as on the overall effectiveness of the organization. This influence spans three components. However, the component related to Idealized Influence was removed from the measurement model due to factor loadings below the threshold. The direct positive influence of leadership on ESG development and organizational effectiveness may stem from the pivotal role of leaders in setting organizational strategies and policies, impacting ESG scores in various aspects. From an environmental perspective, visionary leaders may initiate projects aimed at reducing environmental impacts, promoting sustainable resource use, and leading businesses toward investments in green technologies. From a societal standpoint, socially responsible leaders foster a corporate culture that promotes diversity, values community support, and prioritizes social development. Ethical leaders establish efficient internal control systems, promote transparency, and adhere strictly to regulations. Therefore, companies in the Thai stock market must prioritize leadership development among their personnel, as effective leadership plays a crucial role in guiding organizations to overcome numerous challenges such as intense competition, technological changes, and economic fluctuations. The roles of leadership within companies and organizations in the Thai stock market include setting vision and strategy, motivating and supporting confidence, risk management decision-making, and

fostering good relationships with stakeholders, both internally and externally. These findings align with existing literature (Niu et al., 2022; Zhu & Huang, 2023; Sun, 2022; Chen & Zhang, 2021; Do & Minbashian, 2020). In summary, it can be concluded that companies in the Thai stock market can significantly enhance their ESG scores and organizational effectiveness by improving and elevating their leadership capabilities.

The research findings suggest that technology acceptance directly influences the development and enhancement of ESG scores, as well as directly affects organizational effectiveness in the Thai securities market. The positive direct impact of technology acceptance on ESG score improvement and organizational effectiveness in the Thai securities market may be attributed to the ability of employees to utilize various technologies, thereby promoting increased efficiency and environmental benefits, such as energy conservation and pollution reduction. Additionally, technology can play a role in social aspects, such as community development, and can be used to promote transparency and ethical management practices. This discussion is consistent with the literature (Park & Oh, 2022; Su et al., 2023; Fan et al., 2023).

From the discussion, it can be concluded that if companies in the Thai securities market improve and increase their level of technology acceptance within the organization to the extent that it becomes a norm or culture with a high level, it will have a positive impact on the level of ESG scores and significantly enhance the organizational effectiveness of companies in the Thai securities market.

The research findings indicate that organizational policy factors directly influence the development and enhancement of ESG scores and have a direct impact on the organizational effectiveness of companies in the Thai securities market. The reason why organizational policy factors influence the development and enhancement of ESG scores and have a direct impact on the organizational effectiveness of companies in the Thai securities market in terms of ESG development may be because organizational policies serve to promote transparency in ESG-promoting initiatives, such as disclosing project or departmental information and creating disclosure policies on ESG activities to attract investors.

In terms of accountability, governance policies ensure that organizations are under good governance systems and can effectively manage risk according to the strength of the policy. Clear policies emphasizing equity and fairness significantly impact both the personnel and the overall image of the organization, potentially creating motivating policies that promote

equality and fairness, policies that maintain employee well-being, and policies that attract stakeholders. Consequently, this leads to higher levels of organizational effectiveness. This discussion is in line with the literature of (Al-hiyari et al., 2022; Rogge & Ohnesorge, 2022) Based on the discussion, it can be concluded that if companies in the Thai securities market design well-aligned policies to promote the enhancement of ESG scores, it will significantly contribute to increasing organizational effectiveness

Suggestions

Suggestions from this research

The result of this research found that can be utilized for both academic and practical applications as follows;

1. Companies in the Thai stock market can adapt and tailor the findings to their specific contexts to design policies or strategies that promote and enhance overall effectiveness within the organization

2. Government agencies and relevant entities should engage in comprehensive initiatives to develop the capabilities of companies and promote strategic or policy initiatives aimed at enhancing leadership qualities, attitudes, technology acceptance levels, and policy implementation within companies. this aims to increase the ESG scores of companies, leading to societal impacts and sustainable economic growth for listed companies in the Thai stock market

Suggestions for future research

1. It is advisable to study by categorizing companies and industries in the Thai stock market. This categorization could be based on industry type, products, services, or even categorized by the size of registered capital. This will enhance the accuracy of the structural equation model in forecasting.

2. It is recommended to further investigate additional factors that may influence organizational performance. These variables could have a significant impact on organizational outcomes and could enhance the predictive power of the model when integrated into this structural equation model.

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