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Good Governance and Sustainable Investment: The Effects of Governance Indicators on Stock Market Returns

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Abstract

Purpose: This research studies the impacts of the six Worldwide Governance Indicators (WGI) on sustainable investment returns in the Asian region.

Design/methodology/approach: This research uses the WGI data as proxied of good governance and employs The Fixed Effect Model (FEM) and Random Effect Model (REM) on the panel data from the sustainable stock market returns of six Asian countries to examine the relationship among variables. Further, the Feasible Generalized Least Squares (FGLS) Regression panel regression was conducted to achieve robust findings.

Findings: Our empirical analysis found that political stability and absence of violence (PSA) and regulatory quality (REQ) positively influence sustainable investment returns in the Asian region. While control of corruption (COC) exhibits a significant negative impact on sustainable investment returns. These findings imply that more excellent political stability and reasonable regulations contribute to higher stock market returns. Conversely, contradictory with the Control of Corruption leads to downward stock market returns as the growth of the COC index increases.

Research limitations/implications: This research has several limitations, including the lack of comprehensive sustainable stock market data in the Asian region and a short transaction period. Consequently, future research could categorize the market as developed or emerging, classify the sample based on the efficient market category, expand the sample size and include data from outside the Asian region.

Practical implications: This research has several crucial policy implications for sustainable investors concerning the country-level governance index to create profitable and sustainable portfolio strategies. Moreover, policymakers should strengthen the implementation of anti-corruption to increase the sustainable investors in the Asian region.

Originality/value: This research contributes to the recent literature presenting causal relations of quality country-level governance on sustainable investment returns in the Asian region.

JEL Classifications: C33; E44; G15; O16

Keywords: Sustainable Investment; Market Returns; World Governance Indicators; Asian Market; FGLS

Paper Type: Research Article

Introduction

Good governance at a country level plays a vital role in the stock market's performance. It is related to corporate governance that becomes the critical aspect of attracting investors to invest their wealth in sustainable investment (Tseng et al., 2019). Corporate governance efficacy is contingent upon the quality of country-level governance, which develops excellent value governance in enterprises (Narayan et al., 2015). Thus, the quality of country-level governance also becomes one of the preferences for investors to invest their wealth. These two mechanisms, country and corporate level governances, are the main drivers of governance aspect in sustainable investment or socially responsible investment (SRI) that based on three aspects of ESG (Environment, Social and Governance) (Narayan et al., 2015). Country-level governance consists of the institutional arrangements that include legal regulations, political situation, economic and policies and regulations that implement to establish good order and best practices for business ethics and activities (Aggarwal et al., 2009; Hooper et al., 2009).

In these nine years to achieve Sustainable Development Goals (SDGs) in 2030, trends to invest in sustainable investment are rising in the global market. According to the Global Sustainable Investment Alliance (2020) report, the global market for sustainable investment has reached USD 35.3 trillion, a rise of 15% over the previous two years (2018 – 2020). Sustainable investment grew by 25% in the Australasia area in 2020, reaching USD 906 billion from USD 734 billion in 2018. Furthermore, the expansion of stock exchanges that become members of Sustainable Stock Exchanges (SSE) Initiatives may be considered as evidence of an increase in sustainable investing. SSE membership increased from 78 stock exchanges in 2018 to 114 stock exchanges in 2020 (SSE Initiatives, 2020). As the SDGs' pioneer, the United Nations (UN) established the Sustainable Stock Exchanges (SSE) Initiatives in collaboration with UNCTAD (United Nations Conference on Trade and Development), the UN Global Compact, UNEP FI (United Nations Environment Program Finance Initiative), and the PRI (Principles for Responsible Investment) to provide a platform for collaboration and improved performance on ESG (environment, social, and governance) issues. UN SSE Initiatives also promote the expansion of long-term sustainable investment (SSE Initiatives, 2010).

Mensi et al. (2017) discovered that market conditions such as oil prices, gold prices, energy prices, and the banking sector benefit from risk spillovers while stock indexes contribute. Following that, Silva & Cortez (2016) provide evidence that green funds in the

United States and Europe exhibit time-varying performance and risk. The underperformance of green funds was primarily focused on periods when interest rates were lower in the near term. Moreover, Ortas et al. (2013) discovered that the Dow Jones Sustainability Asia Pacific Index (DJSI-AP) did not underperform the Dow Jones Global Index in research on Socially Responsible Investment in the Asia Pacific (DJ-G). However, DJSI-AP was likewise shown to be less dangerous than DJ-G. After that, Sharma et al. (2020) discovered that financial and market success had a favorable and substantial influence on ESG disclosure in Indian enterprises registered on the Bombay Stock Exchanges.

Furthermore, Sciarelli et al. (2021) highlighted in their research the necessity of integrating and communicating ESG. Enhancing communication and sharing of environmental and social effects SRI might assist in attracting more investors and long-term sustainability. Further, the vast bulk of studies in this subject has contrasted the risk and return characteristics of sustainable and traditional investments (Alghalith et al., 2016; Martí-Ballester, 2015; Oberndorfer et al., 2013; Ortas et al., 2013).

Six primary studies have investigated the relationship between governance quality and stock market performance. The first research conducted by Hooper et al. (2009) found a positive relationship between World Governance Indicators and stock market access returns (rit – rf). Following that, According to Low et al. (2011), the World Governance Indicators have a negative impact on stock market returns in 48 countries. Moreover, Narayan et al. (2015) establish governance quality by examining governance risk indicators at the country level to predict stock market returns. They discovered that national-level governance affected stock market returns only in countries with weak governance. Furthermore, Eldomiaty et al. (2019) investigated WGI and all global stock markets from 1996 to 2016 and discovered that Voice and Accountability and Political Stability are the most significant factors in stock market development. In addition, Imran et al. (2020) contend that good governance relates to greater stock returns. Further, Marshall et al. (2021) study on country governance and international equity returns found that higher equity returns in strong governance countries led to increased equity returns in weak governance countries. These contradicting findings necessitate more research on governance quality and stock market performance to ascertain the impact of governance quality on the stock market.

Hence, there is an essential link between country-level governance indicators and stock market returns. Therefore, this research aims to examine whether indicators of good governance affect the sustainable investment returns in the Asian region. Good governance was proxied by applying the indicators of Worldwide Governance (WGI) by Kaufmann et al.

(2010). This study uses quantitative methods with panel data of WGI and sustainable stock returns in six Asian countries. Panel data regressions and feasible generalized least squares will be applied to examine the research variables.

There is vast literature on stock return prediction, with multiple studies conducted throughout the last decade. On the other hand, most studies explore whether macroeconomic factors or financial aspects predict stock returns. These types of predictor variables are commonly used. Various studies employ conventional stock market returns as a sample, whereas testing whether the sustainable stock market returns remain limited, primarily related to the sustainable stock exchange in the Asian region, which is rising upward (Bekiros et al., 2017; Darsono et al., 2021; Ortas et al., 2013). As a result, by examining beyond frequently utilized variables, this study adds to the current literature on sustainable stock return prediction. This research utilizes multidiscipline factors, especially as additional literature on the concept of good governance impact with sustainable investment returns in the Asian region, which is still limited. These findings provide practitioners, stock investors, and regulators with practical recommendations, notably for policy creation linked to sustainable investing practices for economic development and sustainable investment growth.

Theoretical Background

Institutional Theory

The Institutional theory acts as the underpinning theory for this research. This paradigm places institutions at the center of examining organizational design and behavior. The emergence and importance of institutions were mentioned by Adam Smith in 1976. Smith in Hutchison (1976) claimed that a certain degree of confidence injustice of government, the rule of law and property rights should exist in the country to prosper the manufacturing and commerce sector. The growth of institutional arguments resulted in a rethinking of modern institutionalism thought. Institutional works are contemporary works that deal with beliefs, rules, roles, norms, culture, policies, and laws (Berthod, 2020). Economists concerned in institutions tend to concentrate on regulatory institutions, but organizational academics and political scientists view social norms and commonly accepted beliefs as drivers of organizational action. Earlier developments preserved institutional arguments close to the concept of resource reliance. To thrive, each organization needs different resources: firms require revenue, venture money, or investments (Berthod, 2020; Williamson, 2012). The theoretical framework's expansion has contributed to its long-term viability. However, several challenges remain, including resolving inconsistencies in the

various decision-making and action models that underpin institutional analysis and improving our understanding of the intersection of socio-cultural forces and entrepreneurial agency (David et al., 2019).

Further, Brower & Dacin's (2020) study on the institutionalization of Corporate Social Performance (CSP) discovered that early adopters are more likely to see enhanced company profitability and stock market value as a consequence of their increasing CSP levels. This theory aligned with our research on sustainable investment, which required good institutional performances of firms and regulators. These governance structures influence the performance of sustainable investment and investors' confidence in their level of participation.

Sustainable Investment

A study by Escrig-Olmedo et al. (2017) found that corporate, environmental, financial, and social governance are important aspects for institutional investors to make decisions about sustainable investment. The results come from four different clothing companies that get the best ranking among 52 clothing companies, and it shows a positive relationship between the social and financial performance of the companies. Temporary, Orsato et al. (2015) concluded that the profitability of companies in developing countries is only associated with one proxy for ESG (Environment, Social and Governance) performance such as Environmental performance as significantly negative. The negative sign of this relationship indicates that companies with the best environmental performance tend to be less profitable for investors. Moreover, Tseng et al. (2019) found that corporate governance consisting of transparency, anti-corruption, and board diversity had strong causality on sustainable investment performance. Further research on the relationship between governance indicators and sustainable investment performance is required to complete the current body of knowledge.

Literature Review

The Worldwide Governance Indicator (WGI), which summarizes the quality of governance in industrialized and developing countries, can predict stock returns. The WGI encompasses six dimensions: Voice and Accountability, Political Stability and Absence of Violence, Government Effectiveness, Quality of Regulations, Rule of Law, and Control of Corruption. Naghavi et al. (2018) suggest that a sound institutional framework proxied by world governance indicators could enhance stock market performance. Moreover, based on a previous study on stock returns predictability, good quality of country-level governance will

result in higher stock market returns because a better-regulated economy can support better returns (Hooper et al., 2009; Imran et al., 2020; Klapper & Love, 2004).

The Voice and Accountability (VOA), which assesses political processes such as civil freedoms and political rights, play a vital role in attracting investors to the stock market. According to Wong & McAleer (2009), in the first year of the presidency, stock prices were lower because of the uncertainty regarding the newly elected President's decisions and policies on the economy. Fall in stock prices reached a trough in the second year of their presidency. The rise in stock prices occurred in the second half of their presidency, and it reached a peak in the third or fourth year of the presidency. Conversely, Gomez-Carrasco & Michelon (2017) evaluate the effect of social media activism in terms of Twitter activism of important stakeholders, consumer associations, and trade unions with relation to Spanish-listed banks. The empirical findings reveal that the negative influence of stakeholders' activism in social media amplifies on trade days with a bearish tendency. Similar conclusions about the freedom of the press and its negative impact on stock returns are documented by Abed Masrorkhah & Lehnert (2017). For countries in Europe, North America, South Asia, and Sub-Saharan Africa, the results show a significant negative relationship between the Voice and Accountability index and stock market development. The results in the MENA region, on the other hand, demonstrate a positive and significant influence. This development can be linked to political changes related to the Arab Spring, which resulted in Middle Eastern countries moving toward democratic political changes and greater press freedom (Eldomiaty et al., 2019). Several studies have found that this dimension positively influences the stock market (Boadi & Amegbe, 2017; Imran et al., 2020; Lehkonen & Heimonen, 2012), while others have the opposite (Low et al., 2011; Modugu & Dempere, 2020).

The Political Stability and Absence of Violence (PSA) has a relationship with the stock market performance. The general idea is that investors are not advised to choose countries with unstable situations (Imran et al., 2020; Modugu & Dempere, 2020; Ryu & Slottje, 2020). However, the investors' behavior can change and increase stock market profits (Bello, 2014). Bombings and explosions within Europe bring evidence of stock market volatility across all exchanges (Corbet et al., 2018). In this regard, Hassan & Hasmi (2015) present a surprising result that Karachi Stock Exchange (KSE) is nearly resistant to domestic terrorist attacks. Irshad et al. (2019) discover that country-specific estimations imply a detrimental effect of terrorism on the stock markets of China, the United Kingdom, India, and Pakistan. Terrorist attacks had a beneficial effect on the US and Turkish markets. However, global violence attacks have damaging effects on KSE. Moreover, positive and significant

associations between Political Stability and stock market development are found in Europe, Latin America, North America, and South Asia. However, the results differ in the MENA and Sub-Saharan Africa. It shows a negative and significant impact since these regions endure political instability (Eldomiaty et al., 2019; Imran et al., 2020).

The Government Effectiveness (GVE), one of the World Governance Indicators (WGI), may impact the stock market in different countries. Christou et al. (2017) investigate the impact of economic policy uncertainty (EPU) on stock market returns for six Pacific Rim countries, including Australia, Canada, China, Japan, Korea, and the USA, over 1998–2014. The result is evidence that stock market returns are adversely affected by domestic and US EPU, which indicates international uncertainty spillover. In addition, Eita (2015) found different reactions in stock market performance due to government effectiveness in several African countries. In Botswana, South Africa, and Zambia, the stock market will perform better with effective policy implementation. However, increasing government effectiveness has reduced the performance of stock markets in Kenya and Mauritius. Further, the association between Government Effectiveness and the stock market is positive and significant in Europe, MENA, South Asia, and Sub-Saharan Africa (Eldomiaty et al., 2019; Imran et al., 2020).

The higher quality regulations (REQ), particularly in low-income countries, will result in higher stock market performance (Boadi & Amegbe, 2017). Additionally, regulatory quality matters for stock market development and is expected to handle the repercussion of the financial crisis in Africa (Umar & Nayan, 2018). The results are also supported by the study in MENA, North America, and South Asia, which indicate a positive and significant association between regulatory quality and the stock market (Eldomiaty et al., 2019; Imran et al., 2020). However, Bhargava & Konku (2010) shows regulatory quality had a negative impact on stock market development. Short-selling limitations constrain the ability of prices to adjust in response to new information. Due to the difficulty of predicting price falls, the volatility of stock returns rises.

Interestingly, the indicator Rule of Law (ROL) is related to corporate governance in the business sector. With this quality, the stock market will benefit significantly from improving the rule of law (Ahmed et al., 2020). According to Vega et al. (2015), the Sarbanes Oxley Act (SOA) was applied in 2002 to avoid fraudulent actions in firms that positively impacted the US stock market. Both the risk premium and the volatility of the returns are lower due to the implementation of the SOA. It implicates decreases in market uncertainty and the cost of capital, altering investors' perceptions of the market. Moreover, In European

Union, the degree of enforcement of the unified regulation is a significant indicator to predict market abuse detections both statistically and economically (Cumming et al., 2018).

Further, Dima et al. (2018) highlight the significant support of the rule of law to the capital market in 45 countries. They also found a robust relationship when other legal system variables are considered. In addition, the influence of the Rule of Law indicator on stock development in East Asia and MENA countries is significant and positive. However, the results suggest a negative and significant effect in South Asia on this region's insufficient rule of law (Eldomiaty et al., 2019; Imran et al., 2020).

The Control of Corruption (COC) in a country may cause the volatility of stock returns because corruption can hinder activity in the stock market. After all, it can discourage investors (Bello, 2014). In addition, Phuong (2020) shows that EAP stock market capitalization is also affected. Corruption is more prevalent in emerging stock markets than in developed stock markets. It could be because of the implicit link between giant firms and officials in developing markets. Chen et al. (2018) observe that China's crackdown on corruption lessens the probability of future stock price crash risk.

Furthermore, Lau et al. (2013) explore the relationship between stock market performance in 14 emerging markets from 1996 to 2012 using the World Bank's "Enterprise Survey," which indicates payments made informally to government officials as a proxy for corruption. The findings show that the higher the number of briberies, the lower the stock market volatility due to less ambiguity about government actions. Moreover, a positive and significant association is found between the Control of Corruption indicator and stock market development in Europe, North America, South Asia, and Sub-Saharan Africa. However, the significant relationship is negative in East Asia and the MENA (Eldomiaty et al., 2019). In contrast, Imran et al. (2020) discovered that control of corruption had a positive and significant influence on global stock market annual returns.

Numerous previous studies have examined the aspects that influence stock market performance by predicting financial and macroeconomic variables. However, just a few studies have examined the relationships between non-financial variables and stock returns. Moreover, with the rise of sustainable investment in recent decades, this research will assess the impact of country-level governance on sustainable stock market returns in the Asian area, covering a gap in the current literature.

Data and Research Method

Data and Variables

This study uses a quantitative research design method with secondary data collection through various databases. This study uses panel data of sustainable stock market returns (SSMR) in the Asian region as the dependent variable. In order to examine the effect of good governance at the country level on sustainable stock market returns, this study uses six dimensions of Worldwide Governance Indicators (WGI) as the independent variables. In addition, macro data such as the growth of Gross Domestic Products (GDPG) and inflation (INF) are used as control variables. The data are a panel of 5 years for the period 2015-2020 for six Asian countries.

Dependent Variable

A purposive sampling technique was applied for this research. The research sample uses sustainable stock exchanges data established by United Nations for screening the sustainability index in the Asian region (SSE Initiatives, 2020). Due to the screening process and data limitation, the sample size of this research only consists of six countries in Asia that have sustainability indices such as Indonesia (SRI-KEHATI), Malaysia (F4GBM), Singapore (iEdge SG ESG), India (NIFTY100 ESG), Japan (JPX Nikkei 400), and Turkey (BIST Sustainability Index). The sample data uses a panel of sustainable stock market annual returns in six sustainability indices for 2015 – 2020. Data for the sustainable stock market returns are obtained from the Thomson Reuters DataStream.

Independent Variables

The good governance at the country level was measured by six indicators of Worldwide Governance Indicators (WGI), which were developed by Daniel Kaufmann (Institute for Natural Resource Governance (NRGI) and Brookings) and Aart Kraay (World Bank, Development Economics) in 1999. The Worldwide Governance Indicators (WGI) is a compilation of research data that compiles responses to a poll of firms, citizens, and experts in industrialized and developing nations regarding the quality of governance. This information was gathered from various sources, including survey organizations, think tanks, non-governmental organizations, international organizations, and private firms. This WGI data is one of the most significant data sources for reporting the governance perceptions of many survey respondents and expert judgments from across the nation. Six indicators of WGI such as (1) Voice and Accountability (VOA), which define as *"Perceptions of the extent to*

which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.", (2) Political Stability Absence of Violence/Terrorism (PSA), which capture *"Perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism.",* (3) Government Effectiveness (GVE), which capture *"Perceptions of the quality of public services, the quality of the civil services and the degree of its independence from political pressures, the quality of policy formulation and implementation and the credibility of government's commitment to such policies.",* (4) Regulatory Quality (REQ), which capture *"Perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.",* (5) Rule of Law (ROL), which capture *"Perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.", and* (6) Control of Corruption (COC) which capture, *"Perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption.".* This research investigates all WGI indicators for the panel of six Asian countries using annual data from 2015 to 2020. The data were obtained from Worldwide Governance Indicators (WGI) from World Bank's website developed by Kaufmann et al. (2011).

Control Variables

The growth and volatility of investment are affected by macroeconomic indicators (Irshad et al., 2019; Li & Zhao, 2019; Tursoy & Faisal, 2016). In this research, two macroeconomic risk indicators are used as control variables, such as GDP growth (GDPG) and Inflation (INF). The panel data of six Asian countries' GDPG and INF for 2015-2020 are collected from the World Bank's website (World Bank, 2021).

Research Method

This research applies the model based on the static panel data model to examine the impact of good governance on sustainable stock market returns. Panel data is the combination of cross-sectional data and time-series data. It has two advantages: (i) Panel data gives more useful information and contains high degrees of freedom and efficiency; thus, it brings reliable results for the estimation in the model. (ii) In panel data, we can identify and estimate the impacts that cannot be identified or measured using cross-sectional or time-series data.

However, the dependent variable might be related to unobserved factors correlated with the observed explanators. In this context, panel data estimation methods allow consistent estimation of the effect of observed variables. We consider the following generalized-linear model for panel data:

$$y_{it} = \alpha + x'_{it}\beta + z'_{i}\gamma + c_i + u_{it}\ , \qquad (1)$$

where individual i (i = 1, … , N) are observed at time periods t (t = 1, … , T), u_{it} is an idiosyncratic error term, y_{it} is the dependent variable, x'_{it} is N-dimensional row vector of time-varying independent variables, β is a N-dimensional column vector of parameters, $z'_{i}\gamma$ is M-dimensional row vector of time-invariant independent variables excluding the constant, γ is a M-dimensional row vector of parameters, α is an intercept, and c_i is an individual-specific effect.

It is assumed that each individual i is observed in all time periods t, called the balanced panel. The T observations for i can be shown as follows:

$$y_i = \begin{bmatrix} y_{i1} \\ \vdots \\ y_{it} \\ \vdots \\ y_{iT} \end{bmatrix}_{Tx1}, \quad X_i = \begin{bmatrix} x'_{i1} \\ \vdots \\ x'_{it} \\ \vdots \\ x'_{iT} \end{bmatrix}_{TxN}, \quad Z_i = \begin{bmatrix} z'_{i1} \\ \vdots \\ z'_{it} \\ \vdots \\ z'_{iT} \end{bmatrix}_{TxM}, \quad u_i = \begin{bmatrix} u_{i1} \\ \vdots \\ u_{it} \\ \vdots \\ u_{iT} \end{bmatrix}_{Tx1},$$

in which NT observations for all i and t are shown as wherefollows:

$$y = \begin{bmatrix} y_1 \\ \vdots \\ y_i \\ \vdots \\ y_N \end{bmatrix}_{NTx1}, \quad X = \begin{bmatrix} X_1 \\ \vdots \\ X_i \\ \vdots \\ X_N \end{bmatrix}_{NTxN}, \quad Z = \begin{bmatrix} Z_1 \\ \vdots \\ Z_i \\ \vdots \\ Z_N \end{bmatrix}_{NTxM}, \quad u = \begin{bmatrix} u_1 \\ \vdots \\ u_i \\ \vdots \\ u_N \end{bmatrix}_{NTx1}.$$

The estimation process is obtained by imposing the following assumptions:

- *PL_Linearity*

$y_{it} = \alpha + x'_{it}\beta + z'_{i}\gamma + c_i + u_{it}$, where $E(u_{it}) = 0$ and $(c_i) = 0$,

$\alpha, \beta, \gamma, c_i$, and u_{it} are linearity parameters.

- *PL_Independence*

$\{X_i, z_i, y_i\}_{i=1}^{N}$ is independent and identically distributed. The observation must have been independent across individuals but not across time.

- *PL_Exogeneity*

$E[u_{it}|X_i, z_i, y_i] = 0$; that is, any error term u_{it} is assumed to be uncorrelated with any independent variable of all past, current and future periods of the same individual. It is also assumed that u_{it} is uncorrelated with any individual-specific effect.

- *PL_Variance of the error term*

The error terms are assumed to be homoscedastic and no serial correlation.

$V[u_i|X_i, z_i, y_i] = \sigma_u^2 I, \sigma_u^2 > 0$ and finite, $V[u_{it}|X_i, z_i, y_i] = \sigma_{u,it}^2, \sigma_{u,it}^2 > 0$ and finite, $Cov[u_{it}, u_{is}|X_i, z_i, y_i] = 0 \ \forall s \neq t$; and $V[u_i|X_i, z_i, y_i] = \Omega_{u,i}(X_i, z_i)$ is p.d and finite.

Normally, the Fixed-effects model (FEM) and Random-effects model (REM) are used to estimate the parameters in the panel data regression. The difference between them is manifested in the treatment of unobservable factors (individual-specific effect).

We have the econometric model of REM with the remaining assumptions as shown in the following:

RE_Unrelated effects

$E[c_i|X_i, z_i] = 0$; that is, the individual-specific effect is random and uncorrelated with independent variables of the same individual.

RE_Variance

$V[c_i|X_i, z_i] = \sigma_c^2 < \infty$ (homoscedastic) and $V[c_i|X_i, z_i] = \sigma_{ci}^2(X_i, z_i) < \infty$ . ..(heteroscedastic)

RE_Identifiability

rank(W) = M + N + 1 < NT and $E[W'_i W_i] = Q_{ww}$ is p.d. and finite with $w'_{it} = [1x'_{it}z'_{it}]$,

rank(W) = M + N + 1 < NT and $E[W'_i \Omega_{v,i} W_i] = Q_{wow}$ is p.d. and finite with

$$\Omega_{v,i} = V[v_{it}|X_i, z_i] = \begin{pmatrix} \sigma_v^2 & \sigma_c^2 & \cdots & \sigma_c^2 \\ \sigma_c^2 & \sigma_v^2 & \cdots & \sigma_c^2 \\ \vdots & \vdots & \ddots & \vdots \\ \sigma_c^2 & \sigma_c^2 & \cdots & \sigma_v^2 \end{pmatrix}_{TxT} ,$$

in which $\sigma_v^2 = \sigma_c^2 + \sigma_u^2$

The random-effects model can be shown as:

$$y_{it} = \alpha + x'_{it}\beta + z'_i\gamma + v_{it} \ , \qquad (2)$$

in which $v_{it} = c_i + u_{it}$. Based on all the above-mentioned assumptions, it leads to

$$\Omega_v = V[v|X, Z] = \begin{pmatrix} \Omega_{v,1} & 0 & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & \Omega_{v,i} & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & \Omega_{v,N} \end{pmatrix}_{NTxNT} .$$

REM can be estimated by using the following generalized least squares estimator

$$\begin{pmatrix} \hat{\alpha}_{RE} \\ \hat{\beta}_{RE} \\ \hat{\gamma}_{RE} \end{pmatrix} = (W'\hat{\Omega}^{-1}W)^{-1}W'\hat{\Omega}_v^{-1}y,$$

where $W = [\iota_{NT}\ X\ Z]$ and ι_{NT} is a NT x 1 vector of ones.

The error covariance matrix Ω_v can be estimated by:

$$\sigma_v^2 = \frac{1}{NT}\sum_{t=1}^{T}\sum_{i=1}^{N}\hat{v}_{it}^2, \text{ with } \hat{\sigma}_c^2 = \hat{\sigma}_v^2 + \hat{\sigma}_u^2 \ ,$$

where

$\sigma_u^2 = \frac{1}{NT-N}\sum_{t=1}^{T}\sum_{i=1}^{N}(\hat{v}_{it} - \bar{\hat{v}}_i)^2$,

$\hat{v}_{it} = y_{it} - \alpha_{POLS} - x'_{it}\hat{\beta}_{POLS} - z'_i\hat{\gamma}_{POLS}$, and $\bar{\hat{v}}_i = \frac{1}{T}\sum_t \hat{v}_{it}$. The degree of freedom correction in $\hat{\sigma}_u^2$ is also asymptotically important when N $\to \infty$.

However, in the FEM, these factors are assumed to be correlated with the explanatory variables and estimated through the error terms. The FEM model is shown in the following:

$$y_{it} = \alpha + x'_{it}\beta + z'_i\gamma + u_{it} \ .$$

Letting $\alpha_i = \alpha + z'_i\gamma$, we have (3)

$$y_{it} = \alpha_i + x'_{it}\beta + u_{it} \ .$$

We need another assumption as follows:

FE_Identifiability

$rank(\ddot{X}) = K < NT$ and $E[\ddot{X}'_i\ddot{X}_i]$ is p.d. and finite with $\ddot{x}_{it} = x_{it} - \bar{x}_{it}$ and $\bar{x}_{it} = \frac{1}{T}\sum_t x_{it}$.

Because FEM assumes that time-varying independent variables are not perfectly collinear, x_{it} cannot include a constant or any time-invariant variable. There are only β but neither α nor γ are identifiable in the FEM. With i = 1, … , N and t = 1, … , T, c_i are entity-specific intercepts capturing heterogeneities across entities. An equivalent representation of this model is given by

$$y_{it} = \beta_0 + \beta_1 X_{1,it} + \cdots + \beta_k X_{k,it} + \gamma_2 D_{2i} + \gamma_3 D_{3i} + \cdots + \gamma_n D_{ni} + u_{it} \ , \quad (4)$$

in which $D_{2i}, D_{3i}, \ldots, D_{ni}$ are dummy variables.

For the FEM estimation, by subtracting time averages $\bar{y}_{it} = \frac{1}{T}\sum_t y_{it}$, we have

$$y_{it} = \alpha + x'_{it}\beta + z'_i\gamma + c_i + u_{it} \ , \quad (5)$$

with the within the model: $\ddot{y}_{it} = \ddot{x}'_{it}\beta + \ddot{u}_{it}$, where $\ddot{y}_{it} = y_{it} - \bar{y}_i$, $\ddot{x}_{itk} = x_{itk} - \bar{x}_{ik}$, and $\ddot{u}_{it} = u_{it} - \bar{u}_i$. We can see that c_i, α, and z_i are being deleted. So, the slope coefficient β can be estimated by using the following OLS

$$\hat{\beta}_{FE} = (\ddot{X}'\ddot{X})^{-1}\ddot{X}'\ddot{y} \quad . \qquad (6)$$

Because we cannot ensure the individual-specific effect is unrelated, REM will be more appropriate than FEM if individual characteristics influence the dependent variable. Hausman's test shows whether REM is suitable with H_0: φ_i is not correlated to explanatory variables.

However, the Hausman test is only valid under homoscedasticity and cannot include the time-fixed effect. Thus, the FGLS estimator is the Ordinary Least Square estimator of the transformation isomorphic model, which gives the best linear unbiased (BLUE) estimator under heteroscedasticity (Tongkong & Jantarakolica, 2013; Zhang, Liu, Wang, & Li, 2017). In FGLS, we estimate the $\hat{\Omega}$ from OLS, then use $\hat{\Omega}$ instead of Ω.

$$\hat{\beta}_{FGLS} = (X'\hat{\Omega}^{-1}X)^{-1}X'\hat{\Omega}^{-1}Y \quad . \quad (7)$$

FGLS can be estimated in different ways; among them, the flexible approach is assumed to follow:

$$Var(u|X) = u^2 = \sigma^2 \exp(\delta_0 + \delta_1 x_1 + \delta_2 x_2 + \cdots + \delta_k x_k) \quad . (8)$$

By taking the log of both sides and using $\hat{u}^2$ instead of u^2, we have

$$\log(\hat{u}^2) = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \cdots + \alpha_k x_k + e \; . \qquad (9)$$

Since the predicted value is $\hat{g}_i = \widehat{\log(\hat{u}^2)}$, we convert it by taking the exponential into $\hat{\omega}_i = \exp(\hat{g}_i) = \exp(\widehat{\log(\hat{u}^2)})$, and using WLS with weight $1/\widehat{\hat{u}^2}$ or $1/\hat{\omega}_i$.

Research Model

Based on the research aims to examine the effect of good governance on sustainable stock market returns, the equation for the panel data regression is settled as follows:

$$SSMR_{i,t} = \beta_0 + \beta_1 VOA_{i,t} + \beta_2 PSA_{i,t} + \beta_3 GVE_{i,t} + \beta_4 REQ_{i,t} + \beta_5 ROL_{i,t} + \beta_5 COC_{i,t} + \beta_5 GDPG_{i,t} + \beta_5 INF_{i,t} + u_{it} \; , \quad (10)$$

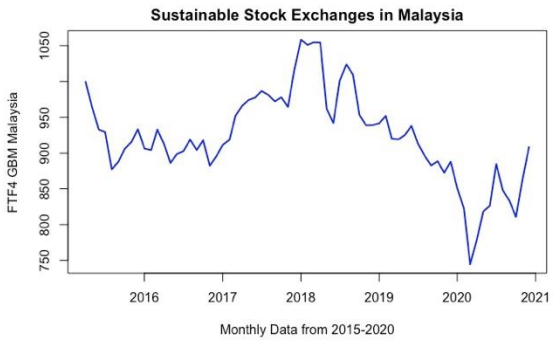
in which $SSMR_{i,t}$ is annual stock market returns from six Asian sustainable stock exchanges for the period of 2015-2020, β_0 is the block coefficient, $VOA_{i,t}$ is the growth rate of voice and accountability, $PSA_{i,t}$ is the growth rate of the political and stability, $GVE_{i,t}$ is the growth rate of government effectiveness, $REQ_{i,t}$ is the growth rate of regulatory quality, $ROL_{i,t}$ is the growth rate of the rule of law, and $COC_{i,t}$ is the growth rate of control of corruption. In addition, this research includes the following two macroeconomics variables as a control variable: annual growth of Gross Domestic Products (Tursoy & Faisal, 2016; Vithalbhai,

2020), $GDPG_{i,t}$ and the annual inflation, $INF_{i,t}$, to control the impact of consumption price on the stock returns (Irshad et al., 2019; Li & Zhao, 2019). While u_{it} is the error term, i is for the country and t is for the year.

Empirical Analysis and Discussion

Figure 1 illustrates the plots of the sustainable stock indices in six Asian countries (Indonesia, Malaysia, Singapore, India, Japan, and Turkey) from April 2015 to December 2020, respectively. According to these figures, the NIFTY100 ESG and JKSRI, which reflect India's and Indonesia's sustainable stock markets, have shown a significant upward trend from 2016 to the end of 2019. During these four years, the other indexes have shifted upward and downward. However, a crisis in 2015 led commodity prices to fall. It was linked to the stock market collapse in these six Asian countries, causing the JKRSI Indonesia, NIFTY100 ESG India, XUSRD Turkey, and JPNK400 Japan to record the lowest values during this research period.

Furthermore, after the crisis in 2016, the sustainable stock indices in these Asian countries experienced a strong bull run until they dropped dramatically towards the end of 2019 because of the non-financial crisis, Covid19 Pandemic. The Coronavirus pandemic not only impacted health and social aspects, but it also had a substantial impact on the financial sectors, starting in the first quarter of 2020. As a result, it caused market bearish in all stock markets worldwide (Moslehpour et al., 2022; Chiah & Zhong, 2020).



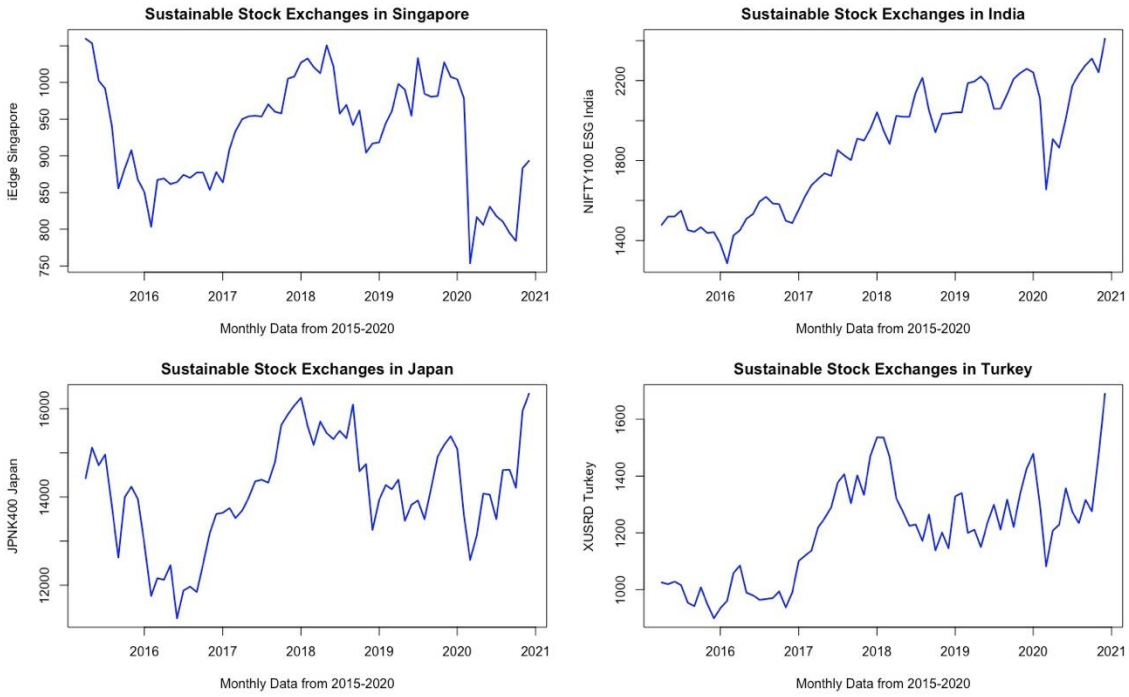


Figure 1. Sustainable Stock Indices Movement in Six Asian Countries

Descriptive Statistics

The results of the descriptive statistics of these research variables, such as means, standard deviation, minimum, maximum, and number of observations are reported in Table 1 below. The number of observations is 30, consisting of six Asian countries with sustainable stock indices for 2015 – 2020. It shows that the mean of sustainable stock market returns (SSMR) as a dependent variable is 2.650 percent. Its standard deviation is 10.696, respectively, while the minimum value is -18.096 and the maximum value is 30.294. It illustrates the increase of sustainable stock returns over the last five years in the Asian market.

Moreover, the mean values of GDPG and INF are 2.395 and 3.658 percent, while the standard deviations are 4.071 and 4.601, the minimum of GDPG and INF are -7.965 and -1.140, and the maximum of GDP and INF are 8.256 and 16.333 percent, respectively. All variables experienced lower percentage growth because of the Covid19 pandemic catastrophe. The mean of six world governance indicators (WGI) is varied regarding the growth of each indicator in this research period.

Table 1. Descriptive Statistics of Variables

Variables	Obs	Mean	Standard Deviation	Minimum	Maximum
Sustainable Stock Market Returns	30	2.650	10.696	-18.096	30.294
VOA	30	9.359	68.979	-80	275
PSA	30	1.480	29.644	-54.167	100
GVE	30	0.359	1.272	-1.8	4
REQ	30	-24.64	55.181	-225	28.57
ROL	30	-6.50	47.528	-200	90.909
COC	30	29.181	173.155	-70	933.333
GDPG	30	2.395	4.071	-7.965	8.256
INF	30	3.658	4.601	-1.140	16.333

Empirical Findings

To examine the effect of good governance on the sustainable stock market in Asian Region across the sample of 6 countries, Table 2 shows the Fixed Effect Model (FEM) and Random Effect Model (REM) results. In the FEM results, none of the World Governance Indicators (WGI) significantly affected sustainable stock market returns. The control variables such as GDP growth had a positive and significant effect on sustainable stock market returns at 1%. The overall r-square of FEM is 0.4151 with the Wald chi-square 2.21 at 10% significance level.

Moreover, the Random Effect Model (REM) had an overall R-square of 0.5260 with a Wald chi-square of 23.30 at a 5% significant level. REM results show that one of the good governance indicators, such as Political and Stability (PSA) had a significant positive effect at a 10% significance level. Then, two control variables had a significant positive effect, such as GDP growth (GDPG) at 1% and Inflation (INF) at a 10% level of significance.

Table 2. Panel Data Regression for Fixed Effects Model (FEM) and Random Effects Model (REM)

Variable	**Fixed Effects Model**	**Random Effects Model**
	Coefficient	Coefficient
VOA	0.0151	-0.0012
	(0.03)	(0.025)
PSA	0.1878	0.1529*
	(0.106)	(0.078)
GVE	-1.376	-0.4489
	(1.829)	(1.425)
REQ	0.0520	0.0435
	(0.041)	(0.036)
ROL	0.0002	0.0001
	(0.0003)	(0.0003)
COC	-0.0186	-0.0186
	(0.017)	(0.013)
GDP	1.6479***	1.5236***
	(0.494)	(0.433)
INF	2.2013	0.7836*
	(1.408)	(0.442)
Cons	-7.700	-2.4462
	(5.384)	(2.294)
Wald Chi-square (F-statistics)	2.21*	23.30**
Prob > F	0.0841	0.0030
Observations	30	30

Note: ( ) denotes standard error, ***, ** and * denote significant levels at 1%, 5% and 10%, respectively

Based on the results of the Hausman test (Table 3), the chi-square is 2.88 with a p-value of 0.7189. These results indicate that Random Effect Model (REM) is the best model to describe the effect of WGI and sustainable stock returns. Moreover, the Breusch and Pagan LM test was applied to check the heteroscedasticity in REM. The results in table 4 show that the p-value is 1.00 > 0.1, which means that the null hypothesis of homoscedasticity is accepted. So, there are no heteroscedasticity problems in this model.

Table 3. Results of Hausman Test

Variable	FEM	REM	Difference	Standard Error
VOA	0.0151	-0.0012	0.0163	0.0129
PSA	0.1878	0.1529	0.0349	0.0619
GVE	-1.3767	-0.4489	-0.9278	0.9593
REQ	0.0520	0.0435	0.0085	0.0131
ROL	0.0002	0.0001	0.00009	0.0001
COC	-0.1866	-0.01864	-0.00002	0.01023
GDP	1.6479	1.5236	0.1243	0.1671
INF	2.2013	0.7836	1.417	1.2478

Test	Ho: difference in coefficients not systematic		
	Chi-square	:	2.88
	Prob>chi-square	:	0.7189

Table 4. Results of Breusch and Pagan Lagrangian Test

	Var	Standard Deviation
SSMR	114.4239	10.6969
e	84.835	9.210
u	0	0
	chibar2	0.00
	Prob > chibar2	1.000

Further, to expect robust findings, the feasible generalized least square (FGLS) was applied to investigate the impact of world governance indicators on sustainable stock market returns in the Asian Region. Table 6 shows the results of FGLS regression, the coefficient is reported in column 2, and the p-Value associated with the null hypotheses of no influence is reported in column 4. These FGLS results found that three governance indicators are profound on sustainable stock market returns in the Asian market. First, the Political and Stability (PSA) and Regulatory Quality (REQ) positively correlate with sustainable stock returns at significant 1% and 5% levels. In contrast, Control of Corruption (COC) had a significant negative effect at a 1% significance level. Then, the control variables such as GDP growth and inflation are positively correlated at a 1% significance level on sustainable stock market returns in Asian Region.

The estimated coefficient of PSA shows that a one percent increment of growth in the PSA index led to an increase in the sustainable stock market returns in the Asian region by 0.1888 percent, with a significant 1% level. The increase of one percent in growth of the

REQ index will increase the returns by 0.0603 percent, with a 5% level of significance. By contrast, increasing one percent growth in the COC index reduces the sustainable stock market returns by 0.0205 percent, statistically significant at a 1% level. The estimated GDP coefficient shows that increasing one percent in GDP growth increases the sustainable stock market returns by 1.3556 percent. Further, an increment of one percent in inflation increases the returns of the Asian sustainable stock market by 1.1438 percent, with significance at a 1% level. Moreover, the p-values of three governance indicators such as Voice and Accountability (VOA), Government Effectiveness (GVE), and Rule of Law (ROL) are higher than 0.1, inferring that there is no significant influence on sustainable stock market returns in the Asian region.

Table 5. Results of Feasible Generalized Least Square (FGLS) Model

Variable	**FGLS Effects**			
	Coefficient	**Std. Error**	**z-Score**	**p-Value**
VOA	0.0035	0.128	0.28	0.782
PSA	0.1888***	0.040	4.61	0.000
GVE	-0.3991	1.141	-0.35	0.727
REQ	0.0603**	0.027	2.18	0.029
ROL	0.00018	0.0001	1.07	0.285
COC	-0.0205***	0.006	-3.26	0.001
GDP	1.3556***	0.268	5.06	0.000
INF	1.1438***	0.394	2.90	0.004
Cons	-3.4167	1.665	-2.05	0.040
Wald Chi-square (F-statistics)	77.57***			
Prob > chi2	0.0000			
Observations	30			

Note: ***, ** and * denote significant levels at 1%, 5% and 10%, respectively

Based on the FGLS results (Table 5), the Political and Stability (PSA) positively and significantly affected sustainable stock market returns in the Asian Region. It indicates that stock market returns are driven by stability conditions of the political situation and the absence of violence in Asian countries. Countries with higher political stability and the absence of violence lead to higher investor confidence, increasing the stock market returns. It is related to Imran et al. (2020) that found better institutional quality, which consists of political stability, increased the performances of stock markets. This result is also supported

by the findings of previous studies by Corbet et al. (2018), Eldomiaty et al. (2019), Modugu & Dempere (2020) that found positive and significant PSA on the stock market returns.

Moreover, the Regulatory Quality (REQ) had a positive and significant effect on sustainable stock market returns in the Asian Region. This result reveals a significant contribution by the countries with higher regulatory control to formulate and implement policies and regulations that experience an upward trend in stock market returns. In countries with good quality regulations, fraud investors cannot manipulate the stock market activity. So, many investors prefer to invest their wealth in the market with good quality and implementation of regulations and policies. It conforms to the findings of (Umar & Nayan, 2018), which found that regulatory quality matters for stock market development and is expected to handle the repercussion of the financial crisis in Africa. The results are also supported by the study of Eldomiaty et al. (2019) and Imran et al. (2020), which indicate a positive and significant association between regulatory quality and the stock market.

Control of Corruption (COC) shows a significant but negative effect on sustainable stock market returns. The negative effect indicates that the tightening effort to control corruption will lower sustainable stock market returns in the Asian region. This result conflicted with the findings of Bello (2014), Eldomiaty et al. (2019), Phuong (2020), and Imran et al. (2020), which found that lower control of corruption can discourage investors and hamper the stock market returns. While the finding of Lau et al. (2013) supported our finding that corruption control has a detrimental impact because corruption and bribery may aid in obtaining more relevant and complete information about market conditions.

These findings provide credence to the underlying theories of this research, such as Institutional Theory, which emphasizes the institutions in the assessment of organizations' design and behavior. A few decades ago, Adam Smith in Hutchison (1976) stated that governance as an institution must be recognized as an inevitable part of developing the economy. The results demonstrate that the country-level quality of governance affects the sustainable stock market returns. The country's higher political stability and regulatory quality led to higher returns. While the increase of control of corruption led to lower returns in the sustainable stock market in the Asian region.

GDP growth has a significant positive effect on Asian stock markets' performance. It illustrates that higher GDP growth is associated with increased stock market returns. Economic growth demonstrates the health of a country's economy, and thus it attracts investment to maximize profits. This finding confirms prior studies by Tursoy & Faisal (2016) in the Turkish stock market and Vithalbhai (2020) in the Indian stock market that established

a substantial causal relationship between GDP growth and stock returns. Moreover, Albentosa et al. (2020) utilized several causality approaches to find evidence for a long-term cointegration between stock market capitalization to GDP and real GDP in the European Union. In particular, the correlation is more significant in Bulgaria, Hungary, Latvia, Romania, Slovakia, and Slovenia. In addition, much previous research supported these empirical findings with evidence that GDP had a strong and positive correlation with the stock market (Cave et al., 2020; Irshad et al., 2019; Jareño & Negrut, 2016; Renna & Lopez, 2019).

Correlations between inflation and stock market performance are subject to change throughout time. It was revealed in this analysis that inflation has a strong positive effect on the returns in the Asian sustainable stock market. Fisher (1930) supported early economics research, which concluded that inflation positively affected stock returns. This finding implies that rising inflation in the Asian region has resulted in higher sustainable stock market returns. Additionally, Irshad et al. (2019) discovered a strong and positive effect of GDP on global equities market returns. However, contrast findings found in several prior studies, such as Antonakakis et al. (2017), indicated a changing outcome between stock prices and inflation in the United States of America from 1791 to 2015. They discovered a positive association in the 1840s, 1860s, 1930s, and 2011 but not in other years. Li & Zhao (2019) discovered a negative association between early and late periods and a positive correlation between late and early periods. Inflation had a detrimental long-run influence on stock prices, but this effect diminished during the crisis eruption (Albulescu et al., 2017; Saungweme & Odhiambo, 2021).

Conclusions

The rise of a sustainable stock market throughout the globe is an essential component of the Sustainable Development Goals (SDGs 2030), and the success of a country's stock market reflects the country's economic growth. This research investigates the impact of good governance on sustainable stock market performance in Asia. The research focused on the impact of six world governance indicators (WGI) on the returns of sustainable stock markets in the Asian region, including voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, the rule of law, and corruption control. Based on screening by the United Nations Sustainable Stock Exchanges Initiatives, this study included six Asian nations that formed the sustainability index, including Indonesia, Malaysia,

Singapore, India, Japan, and Turkey. This study adds to the creation of practical suggestions for practitioners, investors, and regulators, especially with policy formation connected to the influence of good governance on sustainable investing practices for economic development and financial growth. This research uses the annual stock market returns for Sustainable Stock Exchanges in six Asian countries from 2015 to 2020. Panel data regressions were applied for this research, with the Feasible Generalized Least Square model to overcome the problems that may arise in the research model.

This research provides empirical findings on the effect of country-level governance on sustainable stock market returns, especially in the Asian Region. The findings contribute to the existing literature on the effect of non-financial variables on stock market returns. At first, the results of the FGLS analysis demonstrate that good governance significantly affects the Asian sustainable stock market returns. The increment of political stability and absence of violence and regulatory quality growth might lead to higher sustainable stock market returns. Notably, the countries with stable conditions of politics and good quality of regulation attract investors to transfer and increase their wealth. Investment fraud cases decrease with a high quality of regulation and execution, and the stock market becomes more secure for investors. Contradictory, the higher control of corruption growth causes the decreasing of sustainable stock market returns in the Asian region. It implies that the number of corruptions in the Asian area remained high, so therefore enforcing anti-corruption measures reduces the opportunity for bribery and obtaining unauthorized market information. Additionally, the conviction of corruptors in the state raises doubts about the country's transparency and anti-corruption initiatives. Asian sustainable stock market performances were also positively influenced by macroeconomic factors, including GDP growth and inflation. Stronger GDP growth and inflation resulted in higher returns.

A sustainable investment that anchored triple bottom line theory is highly associated with the quality of good governance. Therefore, sustainable stock market investors considered the people, planet, and profit in their investment portfolio. As a result, investors may use the findings of this research to sharpen their focus on the quality of country-level governance. To avoid risk and maximize profits, investors should consider the country-level governance with the index's high value while investing in sustainable stock markets within the Asian region. However, the negative effect of control corruption significantly affects the sustainable stock market returns in the Asian region. It raises some concerns about the corruption situation and the implementation of anti-corruption. Thus, this research

recommends that policymakers in six Asian countries strengthen the implementation of anti-corruption to attract more sustainable investors.

Limitations and further study

This research has several limitations, for instance, the lack of comprehensive sustainable stock market data in the Asian region and a short transaction period. Due to data constraints, the classifications of developed and developing nations in the Asian region are omitted in this assessment. Consequently, future research might categorize the market as developed or emerging, expand the sample size outside the Asian region and classify the sample based on the efficient market category. In this paper, we apply both the Fixed Effect and Random Effect Models and use panel data from the sustainable stock market returns of six Asian countries. Extension of our paper includes using the approaches employed by our paper to study agriculture (Aye and Odhiambo, 2021), social media (Kim, 2021), risk (Chow, et al., 2019), decision-making (Hasan-Zadeh, 2019), volatility (Demirer, et al., 2020), investment (Liew, et al., 2008; Mroua, et al., 2017; Nkeki, 2018; Karp and Van Vuuren, 2019; Yang, et al., 2019; Thanh, et al., 2021). There are many other applications, readers may refer to Hon, et al. (2021) and Wong (2020) for more information.

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