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The role of environmental social and governance in achieving sustainable development goals: evidence from ASEAN countries

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ABSTRACT

Recently, sustainable development goals (SDGs) have become an international requirement that needs to be achieved and requires the focus of recent literature and regulation authorities. Thus, the current article investigates the impact of environmental, social, and governance (ESG) and economic growth on the SDG of ASEAN countries. The current study has extracted secondary data from secondary sources such as SDGs reports and world development indicators (WDI) from 1986 to 2020. The present study has used the Panel Autoregressive Distributed Lag (ARDL) to test the linkage among the variables. The results highlighted that the environmental score, social score, governance score, and economic growth positively associated with the ASEAN countries' SDGs. The current article provides help to new researchers while conducting research on achieving SDGs and guides policymakers while establishing policies regarding achieving the SDGs through ESG.

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1. Introduction

The consistent rapid increase in the industrialized and service sectors' activities have put an immense pressure on the environment, natural resources, and social beings. Although this is one of a big issue, the involvement of individuals or organizations in social or ecological friendly work is limited (Schroeder et al., 2019). Awareness among the public about the environmental and social impacts of economic activities has been increasing, including the government and business organization that paid

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attention to goals other than financial profits, such as the goals committed to environmental protection and social development (Rasoolimanesh et al., 2020). In 2015, an agenda was specially designed and introduced by the United Nations (UN) general assembly for sustainable development by 2030. The agenda included the 17 Sustainable Development Goals (SDGs) and 169 objectives. The prescribed 17 goals are in three categories: social, environmental, and economic sustainability and five Ps like planet, people, peace, prosperity, and partnership (Herrero et al., 2021; Suryanto et al., 2021). The SDGs for such conditions or context can lead the country towards sustainable development along with resource availability, efficient resources consumption, joint prosperity, and a healthy work environment. One of the aims of SGDs introduction is to promote an innovative and people-oriented sustainable economy that assures employment and high living standards. It focuses on the health of all living creatures, including humans, the prosperity of human beings, and the eternity of economic growth (Di Vaio et al., 2020; Trung et al., 2021).

E environmental, social, and Governance (ESG) is the set of standards designed to evaluate and regulate the environmental, social, and corporate performance of business firms. It is the way to evaluate the firms' conscientiousness or sense of responsibility towards social welfare, environmental protection, and economic progress (Escrig-Olmedo et al., 2019). It is not only the analysis or monitoring of conscientiousness of the firms but also the effectiveness of the policies made in this regard. SDGs declared in the sustainability agenda 2030 by the UN assembly are interconnected and dependent on environmental, social, and corporate governance (Khaled et al., 2021; Zhao et al., 2021). SDGs for the country are achieved through the aggregate efforts of all business organizations, firms, or corporations to protect the environment from pollution, improve social wellbeing through favorable relations and developmental work for society members, and increase corporate performance (Consolandi et al., 2020; Rojek-Adamek, 2021; Vveinhardt & Sroka, 2021). When the individual business organizations or organizations in collaboration have the conscientiousness and follow the regulations to mitigate the negative environmental influences of their activities, such as clean sanitation system, provision of clean water, a clean climate, good health, human wellbeing, protection of natural resources, and so on (Nurwani et al., 2020; Pashkevich & Haftor, 2020; Saetra, 2021). Similarly, the assessment and governance of the social performance of the firms encourage the attainment of SDGs, which are aimed at the long-term progress of the country. The policies and activities of the firms to maintain healthy and sound relationships with the stakeholders to protect their rights and benefit themselves from these connections facilitate the achievement of SDGs (Betti et al., 2018; Drebee et al., 2020; Piligrimienė et al., 2021).

This study examines the role of ESG scores in determining the country's capacity to achieve SDGs with evidence from 10 ASEAN countries, including Brunei, Cambodia, Laos, Indonesia, Malaysia, Myanmar, Philippines, Thailand, Singapore, and Vietnam. SDG Indicators Baseline Report 2020, launched by ASEAN, shows all ASEAN member states' progress in achieving the SDGs through the social, environmental, and economic performance indicators (Jelača et al., 2020; Ma'ruf & Aryani, 2019; Mahmood et al., 2021). According to this report on December 2020, the first SDG, no poverty, has been achieved by ASEAN countries, with the reduction in the

proportion of the population living under the poverty line from 14.8% in 2016 to 13.0% in 2018 in urban areas while from 20.1% in 2016 to 18.0% in 2018 in rural areas (Ahmad et al., 2019; Hu et al., 2021). There is an improvement in the ninth goal, industry, innovation, and infrastructure in ASEAN countries which was indicated by the rise in the employment rate from 11.6% in 2016 to 12.6%, while in 2018, the mobile network employment rose from 75.1% in 2016 to 78.6% in 2018. Additionally, the ASEAN countries achieved the 17th SDG, Partnership for the Goals, with the improvement in its fiscal capacity to attain revenues in 2020 (Al Mamun et al., 2021; Iqbal et al., 2020; Lassala et al., 2021). With high social development through significant improvements, ASEAN countries achieveed the fourth and fifth goals, gender equality and quality education. This is indicated by the 10% annual increase in the proportion of trained and qualified teachers and a 4% annual increase in the female proportion at managerial seats in 2020 (Pop et al., 2021; Sharma, 2020; Symaco & Tee, 2019).

Although ASEAN countries collectively achieved SDGs on account of some economic and social indicators, there are still many negative trends in the context of environmental indicators. For example, as far as the 13th goal, climate action, is associated, the rate of missing persons, affected persons, and deaths because of climate-related disaster is still high. The number of persons affected by climate disasters climbed from 2,281 in 2017 to 3,522 per 0.1 million population in 2018 (Albu & Albu, 2021; Khan et al., 2019; Vveinhardt & Sroka, 2020). In the 15th SDG, promotion of sustainable land ecosystem, the struggle to protect the regional forests is a total disappointment as the number of areas covering natural forests as a proportion of total land area has been decreasing annually from 44.8% to 43.8% in 2018 (Miceikiene et al., 2021; Qureshi et al., 2020; Ziolo et al., 2020). ; Though efforts have been made for the energy transition, the 7th goal in SDGs, the results are still unsatisfactory. Despite renewable energy sources such as wind, solar, and hydropower being introduced into the regions, their distribution or consumption is not efficient or effective. ASEAN countries have shown decreased renewable energy consumption from 22.6% in 2016 to 20.6% in 2018 (Belas & Cepel, 2020; Mikołajczak, 2021; Murshed et al., 2021). Although the 10 ASEAN countries progressively work for the achievement of SDGs proposed by the UN assembly in the sustainability agenda for 2030, its progress is still far away. The progress that the ASEAN countries collectively make for the achievement of SDGs in the contexts of social and economic indicators is minor, but it is not enough to attain maximum goals out of the 17 SGDs. The ASEAN countries' progress in environmental indicators is nothing but a disappointment; rather, the environmental performance of ASEAN countries is far less showing negative rate over the years. The weak efforts for environmental performance are a prominent hurdle in the way to achieving the SDGs (Bernardelli et al., 2021; Chapman et al., 2018; Górska & Mazurek, 2021; Štreimikienė & Ahmed, 2021b).

Because of the low speed of ASEAN countries on the road to the achievement of SGDs, which have the essence of survival and sustainable progress of the country, the authors want to focus on the possible ways to gain SDG. The study's objective is to examine the influences of ESG dimensions like environmental governance, social governance, corporate governance, and economic growth on the achievement of SDGs. This study is a great extension of the literature, for several reasons: (1) Though the

attainment of SDGs has been a favorite topic of research and discussion among scholars and academics, this study goes to the peak to deal with SDGs from all possible aspects; (2) ESG is a recent developmental concept that scholars or researchers have addressed as a complete term for sustainable development; hence, this study is a great contribution to the literature as it explores the three dimensions of ESG like environmental governance, social governance, and corporate governance to examine the achievement of SDGs; (3) Mostly, the research studies written about the attainment of SDGs focus only on the environmental indicators, and some of the studies have looked at both social and environmental indicators to achieve SDGs. Our study makes a distinction by elaborating all the environmental, social, and economic indicators to achieve the SDGs; (4) The relationship between ESG dimensions such as environmental governance, social governance, and corporate governance along with economic growth with the achievement of SDGs has mostly been addressed with evidence from one or two countries. This extends the literature with the analysis of ESG dimensions of environmental governance, social governance, and corporate governance, along with economic growth with relation to SDGs' achievement.

The current study contains third systematic parts: The first part examines the relation among ESG dimensions like environmental governance, social governance, and corporate governance along with economic growth and the achievement of SDGs through the lens of the authors' literary arguments in other words. The second part describes the ways adopted to collect data and analyze the validity of the relationship proposed by the study. Finally, in the third part, the study results are compared and supported by previous studies. The paper ends with the study's significance, conclusions, and limitations.

2. Literature review

Simple economic growth determines the country's position in the international market, but sustainable development is for maintaining this position across the countries. Sustainable development is not only meant for economic growth but also lead to resource abundance and high quality, healthy living creature, and social prosperity within the country (Caiado et al., 2018; Farelnik et al., 2021; Štreimikienė & Ahmed, 2021a). The 17 SDGs proposed by the UN general assembly not only improve but also sustains the improved economic development along with a prosperous and healthy public. The 17 SDGs are categorized into social, environmental, and economic development. The ESG score, which contains the standards to evaluate and regulate the social, environmental, and corporate performance of the particular firms, improves the social, environmental, and corporate performance of the business enterprises and is helpful to gain all the 17 prescribed SDGs (Allen et al., 2018; Al-Refaie et al., 2020; Hussain et al., 2021). This study examines the role of ESG dimensions like environmental governance, social governance, and corporate governance together with economic growth in achieving the SDGs. The impacts of ESG dimensions like environmental governance, social governance, and corporate governance, and economic growth on the achievement of SDGs have a dominant place in the literature. The recent study examines the relationship among ESG dimensions like

environmental governance, social governance, and corporate governance and economic growth and the achievement of SDGs in the light of previous literature.

Environmental governance is one of the dimensions of ESG, and it helps encourage the investment and efforts of business organizations to improve the environmental performance so that the SGDs related to the quality and its outcomes can be achieved (Mahmood et al., 2021; Roscoe et al., 2019). Environmental governance refers to the formation and execution of the rules and regulations for environmental protection from the negative impact of economic activities undertaken by the business enterprises and the evaluation of environmental performance regularly. Under ESG execution, the business enterprises focus on raising the marketing and profitability and give equal importance to the public environmental concerns and the mitigation of environmental impacts. Thus, the SDGs such as clean water and sanitation, affordable clean energy, climate action, life on land, life below water, and good health of people can be attained (Vega-Muñoz et al., 2021). An academic article was written by Vollmer et al. (2021) to analyze the impact of environmental governance and the achievement of the sixth SDG, clean water and sanitation, and third SDG, good health. The Freshwater Health Index analysis was performed in three different river basins, namely Guandu, Alto Mayom, and Bogotá in Latin America. Environmental governance is measured with a 0-100 scale through data from perception-based surveys administered to stakeholders. The findings revealed that when the business firms have the policy to carry ecological friendly production processes and have effective waste management, the toxic waste is minimum or disposed properly and thus, do not pollute the water after getting mixed in the water. Thus, the environmental governance maintain the quality of water and does not damage the health of people. Pahl-Wostl et al. (2018) states that it becomes easier for the country to achieve maximum interrelated goals under the SDGs agenda when business organizations or institutions conduct their operations in such a way as to reduce the negative impacts of their operations on environmental quality, including all environmental elements such as land, air, water, plants, and living creatures. Thus, the current study hypnotized that:

H1: Environmental governance has a positive association with SDGs in ASEAN countries.

ESG dimension, social governance within the business organizations enhance the organizations' share to the country's achievement of SDGs (Siakwah et al., 2020). Social governance refers to the rules and regulations which business organizations apply to improve relations with the stakeholders and take care of their rights, wellbeing, and prosperity while undertaking business activities. Social governance is useful for both the business organizations and the stakeholders who are ultimately the part of the public whose prosperity, living standard, wellbeing, and rights are the major concern of the SDGs. So, effective corporate governance under ESG assists in achieving the SDGs (Criado-Gomis et al., 2020; Li et al., 2018). The investigation of De Guimarães et al. (2020) was an approach towards SDG achievement with the analysis of social governance and quality of life within the smart cities. It is quantitative research with descriptive nature through a survey administered to 829 inhabitants of a region of Northeast Brazil. For analysis, multivariate data techniques with SEM

methodology were used. In smart cities where the social governance through effective communication and information system is high, the quality of life increases as the employers know and can meet the basic needs of the employees and thus, motivate them for effective working and raising their standard of living. Social governance assists to achieve the SDGs including industry, decent work, no poverty, zero hunger, good heath, and improved wellbeing. The research of Xue et al. (2018), investigated the social governance within business organizations and their role in the SDGs achievement. Evidence was collected from enterprises operating in the Chinese economy. The results highlighted that under the evaluation and regulation of social governance, the management formulates its policies to refine its relations with the employees responsible for operating the business activities. These policies may include the practices like smooth communication to employees, encouraging them to express their thoughts, providing them emotional and financial support, training them for better performance, and taking care of their health. These practices facilitate the SDGs proposed by UN member in China. Through empirical research, Menton et al. (2020) examined the influences of social governance at the organization level and its impact on SDGs goals introduced by the UN as 2030 agenda for sustainable development. Social governance in business enterprises is meant for the diversity among the employees, provision of due rights to the stakeholders, consumer protection, and environmental protection. The study posited that when business enterprises follow the laws and regulations specially designed for the encouragement of effective social relations with the stakeholders, all the business decisions are made, and business activities are performed with a great sense of responsibility towards the stakeholders without affecting their health, economic rights, and emotions. This opens the door to success for organizations themselves and assures good health and well-being of the stakeholders along with equal rights. Thus, the current study has developed the following hypothesis:

H2: Social governance has a positive association with SDGs in ASEAN countries.

Corporate governance is one of the three dimensions of ESG, whose effective implementation encourages the achievement of SDGs (Dahlmann et al., 2019). Corporate governance is a set of regulations, methods, processes, and relationships employed by various parties to control, manage, and operate a business. The rules and procedures for making decisions in corporate affairs are identified in governance structures and principlesincluding the distribution of rights and duties among different stakeholders of the corporation (such as shareholders, the board of directors, managers, regulators, creditors, auditors, and other stakeholders). Corporate governance is required because of the likelihood of conflicts of interest between stakeholders, shareholders, and top management (Naciti, 2019). A study conducted by Martínez-Ferrero and García-Meca (2020) investigated the effectiveness of internal corporate governance as a determinant of a firm's share to the achievement of SDGs proposed by the UN. With the European sample for 2016-2017, the study examined board composition, board attendance, and CEO independence as internal corporate governance elements affecting the firm's commitment to SDGs. By using several regression analyses, the findings revealed that higher internal corporate governance effectiveness enhances the firms' strength to show SDGs in sustainability reports. The

results showed a positive link between internal corporate governance and SDGs achievement. A study by Pizzi et al. (2021) identified the determinants of business contribution to the 2030 Agenda containing 17 SDGs. The analysis sample for this research contains the non-financial reports of 153 Public Interest Entities in Italy. The study suggested that under effective corporate governance, different departments of the business organization are effectively managed with effective board size, board membership, board independence, effective organizational structure, and organizational climate. The effectively implemented corporate governance, which is a part of ESG, improves financial progress and improves the social and ecological friendly performance of the concerned enterprises. Thus, the current study hypnotized that:

H3: Corporate governance has a positive association with SDGs in ASEAN countries.

Dantas et al. (2021) research was about the role of economic growth, circular economy, and industry 4.0 in achieving SDGs. The data for the research was acquired from previous articles with the help of the software Zotero v5.0. Four types of studies, like case studies, review articles, methodological development, and mixed study on economic growth, circular economy, and industry 4.0 in achieving SDGs, were inspected for quantitative analysis. The study posited that economic growth, circular economy, and industry 4.0 had a positive association with SDGs. The authors argued that when there is high economic growth, the business enterprises themselves can come up with different ecological friendly programs like sharing economy, energy efficiency, and applying environmentally friendly technologies. These practices on the part of business enterprises assure the SDGs in the country. An article by Blagov and Petrova-Savchenko (2021) focused on the impacts of economic growth on SDG achievement. This study implied that in countries with high economic growth, fast progress is there in the technological field, bringing innovation in infrastructure, transportation, communication network, and production activities. Hence, the economic growth helped achieve the ninth SDG, industry, innovation, and infrastructure. Shahbaz et al. (2021) emphasized the SDGs achievement in a high economic growth rate. When the economy grows rapidly, the output of products and services inside the economy tends to increase. A huge labor force is necessary to carry out the increasing productive activity. This creates job opportunities and raises employees' living standards through increasing employment, pay, and bonuses. As a result, the increased growth rate aids in the achievement of SDGs such as ending poverty and hunger. The empirical research by Sinha et al. (2020), paid attention to economic growth that contributed to the achievement of SDGs with evidence from educational institutions of selected 11 economies. They found that in the period of high economic growth, educational institutions, like other economic sectors, bring innovation in the educational management, teaching methods, and sources of learning to provide improved education to students. Moreover, in the country growing fast, education policies are designed to provide education without male or female distinction and facilitate education in rural and urban areas. This way, economic growth facilitates the achievement of SDGs related to education, equality, and rural progress. Thus, the current study has developed the following hypothesis:

H4: Economic growth has a positive association with SDGs in ASEAN countries.

Table 1. Variables with measurements.

S#	Variables	Measurement	Sources
01	Sustainable Development Goals	SDG Index	SDG Report
02	Environmental Social and Governance	Environmental score out of hundred	WDI
		Social score out of hundred	WDI
		Governance score out of hundred	WDI
03	Economic Growth	GDP growth (annual percentage)	WDI

Source: WDI & SDG report.

3. Research methods

The article investigates the impact of ESG and economic growth on the SDG of the ASEAN countries. The current study has extracted secondary data from secondary sources such as SDGs reports and WDI from 1986 to 2020. The present study used the Panel ARDL to test the linkage among the variables. The study equation is given as:

$$SDGI_{it} = \alpha_0 + \beta_1 ES_{it} + \beta_2 SS_{it} + \beta_3 GS_{it} + \beta_4 EG_{it} + + e_{it} \quad (1)$$

Where;
SDGI = SDG Indexi = Country$t$ = Time Period
ES = Environmental Score
SS = Social Score
GS = Governance Score
EG = Economic Growth

The current article has taken the SDG as the dependent variable and measured it as the SDG index. In addition, the current study has also used the ESG as the independent variable measured as the environmental, social, and governance scores. Finally, the current article has also used economic growth as the control variable and was measured as GDP growth (annual percentage). Table 1 highlights the variables and measurements.

Using descriptive statistics, the current research examines the mean, maximum values, standard deviation, minimum values, and observation. In addition, the researchers also checked the correlation among the understudy constructs using a correlation matrix. Moreover, the current article also examines the stationarity using Augmented Dickey-Fuller (ADF) test. The standard for the ADF test is that if the probability value is lower than 0.05, then the variable is stationary at the level and vice versa. But if the probability value is lower than 0.05 at the first difference, then the variable is stationary at the first difference and vice versa. The equation is given as below for the ADF test:

$$d(Y_t) = \alpha_0 + \beta t + \mathrm{Y} Y_{t-1} + d(Y_t(-1)) + \varepsilon_t \quad (2)$$

In addition, the characteristic of the ADF test is that it checks the stationarity of the constructs individually. Thus, the equation for each variable is mentioned below:

SDG Index (SDGI)

$$d(SDGI_t) = \alpha_0 + \beta t + \mathrm{Y} SDGI_{t-1} + d(SDGI_t(-1)) + \varepsilon_t \quad (3)$$

Environmental Score (ES)

$$d(ES_t) = \alpha_0 + \beta t + \mathrm{Y} ES_{t-1} + d(ES_t(-1)) + \varepsilon_t \quad (4)$$

Social Score (SS)

$$d(SS_t) = \alpha_0 + \beta t + \mathrm{Y}SS_{t-1} + d(SS_t(-1)) + \varepsilon_t \quad (5)$$

Governance Score (GS)

$$d(GS_t) = \alpha_0 + \beta t + \mathrm{Y}GS_{t-1} + d(GS_t(-1)) + \varepsilon_t \quad (6)$$

Economic Growth (EG)

$$d(EG_t) = \alpha_0 + \beta t + \mathrm{Y}EG_{t-1} + d(EG_t(-1)) + \varepsilon_t \quad (7)$$

The current study has more than thirty years under observation which show the study can use the time series estimations. Thus, the stationarity test exposed that Panel ARDL is appropriate for the study. In addition, both 'pooled mean group' (PMG) and 'mean group' (MG) estimators could be used, but the best method should be adopted by the researchers using the Hausman test. Thus, the Hausman test has been used to select the best estimator among PMG and MG. The standard rule is that if the probability value is larger than 0.05, the PMG model is suitable and vice versa. The equation given below is related to the Hausman test.

$$H = (b_1 - b_0)\,(Var\,(b_0) - Var\,(b_1))\,(b_1 - b_0) \quad (8)$$

The Hausman test exposed that the PMG panel model is appropriate. In addition, it is also an appropriate estimation when variables are integrated at '1(0) or 1(1) but not 1(2)'. Moreover, it is also the best estimation for small samples (Sharif et al., 2020) as the researchers have used only 350 observations. It also provides short and long-run results. The PMG panel ARDL equation is given as below:

$$\begin{aligned}\Delta SDGI_{it} = \alpha_0 + \sum \delta_1 \Delta SDGI_{it-1} + \sum \delta_2 \Delta ES_{it-1} + \sum \delta_3 \Delta SS_{it-1} \\ + \sum \delta_4 \Delta GS_{it-1} + \sum \delta_5 \Delta EG_{it-1} + \varphi_1 SDGI_{it-1} + \varphi_2 ES_{it-1} + \varphi_3 SS_{it-1} \\ + \varphi_4 GS_{it-1} + \varphi_5 EG_{it-1} + \varepsilon_{it}\end{aligned} \quad (9)$$

4. Study results

The current article has run the descriptive statistics showing country-wise data variables. The figures highlighted that the minimum value of SDGI was 60.252 in Brunei, while the maximum value of SDGI was 77.242 in Vietnam. The statistics also highlighted that the minimum value of ES was 63.445 in the Philippines, while the maximum value of ES was 77.924 in Malaysia. The figures also exposed that the minimum value of SS was 66.564 in Brunei, while the maximum value of SS was 79.002 in Singapore. In addition, the figures highlighted that the minimum value of GS was 66.302 in Brunei while the maximum value of GS was 78.093 in Singapore.

Table 2. Descriptive statistics (Country).

Countries	SDGI	ES	SS	GS	EG
Brunei	60.252	67.993	66.564	66.302	3.415
Cambodia	62.201	68.093	67.009	67.823	4.726
Indonesia	64.092	66.983	68.993	67.094	4.982
Laos	66.092	67.252	61.023	67.463	3.234
Malaysia	75.732	77.924	74.773	77.983	6.832
Myanmar	70.342	71.252	68.309	71.276	5.723
Philippines	69.098	63.455	66.733	68.734	6.823
Singapore	82.092	78.665	79.002	78.093	9.735
Thailand	76.922	77.774	72.762	70.922	7.535
Vietnam	77.242	75.645	71.027	70.998	8.242

Source: Authors estimation.

Finally, the results also highlighted that the minimum value of EG was 3.234% in Laos, while the maximum value of EG was 77.242% in Singapore. Table 2 shows the country-wise descriptive statistics.

The current article has also run the descriptive statistics that show the year-wise data about the variables. The figures highlighted that the minimum value of SDGI was 60.091 in 1986, while the maximum value of SDGI was 81.495 in 2020. In 1989 the minimum value of ES was 60.367, while the maximum value of ES was 76.416 in 2018. The figures also exposed that the minimum value of SS was 63.067 in 1991 while the maximum value of SS was 76.805 in 2019. In addition, the figures highlighted that the minimum value of GS was 61.982 in 1986 while the maximum value of GS was 76.449 in 2018. Finally, the results also highlighted that the minimum value of EG was −3.620% in Laos, while the maximum value of EG was 10.210% in 2017. Table 3 shows the year-wise descriptive statistics.

The current research examined the mean, maximum values, standard deviation, minimum values, and observation using descriptive statistics. The results indicated that 350 observations were used by the researchers, and the mean value of SDGI was 65.242 while the average value of ES was 64.883. In addition, the mean value of SS was 65.994, while the average value of GS was 66.092, and the mean value of EG was 4.332%. Table 4 shows these results.

The researchers also checked the correlation among the understudy constructs using a correlation matrix. The results investigated that the ES, SS, GS, and EG have a positive linkage with SDGI. Table 5 shows these findings.

Moreover, the current article also examines stationarity using the ADF test. The standard for the ADF test is that if the probability value is lower than 0.05, then the variable is stationary at the level and vice versa. But if the probability value is lower than 0.05 at the first difference, then the variable is stationary at the first difference and vice versa. The results indicated that SDGI and EG were stationary at a level while ES, SS, and GS were stationary at first difference. Table 6 shows the findings of unit root test.

Hausman test has been used to select the best estimator among PMG and MG. The standard rule is that if the probability value is larger than 0.05, then the PMG model is suitable and vice versa. The figures highlighted that the probability value is bigger than 0.05, and that the exposed PMG model is suitable. The results of the Panel ARDL (PMG) model highlighted that the environmental score, social score,

Table 3. Descriptive statistics (Year).

Years	SDGI	ES	SS	GS	EG
1986	60.091	61.092	63.135	61.982	−3.620
1987	60.572	61.592	63.562	62.435	−3.330
1988	61.353	61.923	63.902	62.763	−2.920
1989	61.934	60.367	64.300	63.174	2.590
1990	62.565	62.782	64.684	63.565	2.240
1991	63.196	63.198	63.067	63.955	4.890
1992	63.827	63.613	65.451	64.346	3.540
1993	64.458	64.029	65.834	64.736	−1.190
1994	65.089	64.444	66.218	65.127	5.840
1995	65.720	64.860	66.601	65.517	4.490
1996	66.351	65.275	66.985	65.908	4.140
1997	66.982	65.691	67.368	66.298	0.210
1998	67.613	66.106	67.752	66.689	0.560
1999	68.244	66.522	68.135	67.079	0.910
2000	68.875	66.937	68.519	67.470	1.260
2001	69.506	67.353	68.902	67.860	1.610
2002	70.137	67.768	69.286	68.251	1.960
2003	70.768	68.184	69.669	68.641	2.310
2004	71.399	68.599	70.053	69.032	2.660
2005	72.030	69.015	70.436	69.422	3.010
2006	72.661	69.430	70.820	69.813	3.360
2007	73.292	69.846	71.203	70.203	3.710
2008	73.923	70.261	71.587	70.594	4.060
2009	74.554	70.677	71.970	70.984	4.410
2010	75.185	71.092	72.354	71.375	4.760
2011	75.816	71.508	72.737	71.765	5.110
2012	76.447	71.923	73.121	72.156	5.460
2013	77.078	72.339	73.504	72.546	5.810
2014	77.709	72.754	73.888	72.937	6.160
2015	78.340	73.170	74.271	73.327	6.510
2016	78.971	73.585	74.655	73.718	6.860
2017	79.602	74.001	75.038	74.108	10.210
2018	80.233	76.416	75.422	76.499	9.560
2019	80.864	74.832	76.805	74.889	7.910
2020	81.495	75.247	76.189	75.280	8.260

Source: Authors estimation.

Table 4. Descriptive statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
SDGI	350	65.242	4.729	60.252	82.092
ES	350	64.833	6.663	61.882	79.092
SS	350	63.994	7.292	60.992	79.002
GS	350	66.092	6.739	60.039	78.252
EG	350	4.332	7.927	−7.531	14.726

Source: Authors estimation.

Table 5. Matrix of correlations.

Variables	SDGI	ES	SS	GS	EG
SDGI	1.000				
ES	0.342	1.000			
SS	0.436	0.483	1.000		
GS	0.329	0.399	0.529	1.000	
EG	0.209	0.372	−0.403	0.486	1.000

Source: Authors estimation.

Table 6. Unit root test.

Augmented Dickey-Fuller Test (ADF)	Level	t-statistics	p-values
SDGI	I(0)	−6.773	0.000
ES	I(1)	−5.983	0.000
SS	I(1)	−4.873	0.009
GS	I(1)	−5.922	0.000
EG	I(0)	−4.312	0.016

Source: Authors estimation.

Table 7. Panel ARDL (PMG).

D.SDGI	Beta	S.D.	z	P > z	L.L.	U.L.	Decisions
	Short-run relationships						
ES	1.093	0.292	3.743	0.003	0.192	1.982	Accept H1
SS	1.263	0.183	6.902	0.000	0.029	3.826	Accept H2
GS	1.621	0.291	5.570	0.000	1.262	3.873	Accept H3
EG	0.920	0.263	3.498	0.012	0.873	1.994	Accept H4
ECT	0.192	0.053	3.621	0.010	0.739	1.743	
	Long-run relationships						
	ES						
D1.	0.172	0.076	2.263	0.017	0.924	2.829	Accept H1
	SS						
D1.	0.165	0.054	3.056	0.004	0.376	3.752	Accept H2
	GS						
D1.	0.873	0.283	3.085	0.001	0.535	3.092	Accept H3
	EG						
D1.	0.223	0.101	2.208	0.034	1.034	2.734	Accept H4
_cons	−0.342	0.092	−3.717	0.000	−1.645	−0.223	

Source: Authors estimation.

governance score, and economic growth have a positive association with SDGs of the ASEAN countries in the short and long run. Thus, hypothesis H1, H2, H3, and H4 were accepted. Table 7 shows the linkages of the variables.

5. Discussion

The results of the present study established a positive relationship between environmental dimensions, one of ESG dimensions, and the achievement of SDGs, therefore accepting H1. Recently, a research article by Kørnøv et al. (2020) supported the present study findings with a focus on the same issue. This research article revealed that when business organizations or institutions carry their activities in such a way as to reduce the adverse impacts of the operations on the environmental quality along with all environmental elements like land, air, water, plants, and living creatures, it becomes easy for the country to gain maximum interrelated goals under the SDGs agenda. The results were also in line with the research study of Fonseca and Carvalho (2019). The study examined the environmental concerns of ESG and its role in the achievement of SDGs for the country. According to the authors' arguments, the execution of environmental regulatory practices like waste management, sanitation system, clean energy consumption, and reduction of toxic gas emissions assists in achieving goals set for sustainable development. Similarly, the findings of the study by Omisore (2018) agreed with the present study results, which advocated the same relationship between environmental regulations and the achievement of SDGs. It is

stated that the corporations which care for the implementation of effective environmentally friendly regulations will include practices regarding ecological friendly resources, clean energy, and the adoption of environmentally friendly operations. Such institutions protect the quality of environmental factors like air, water, atmosphere, quality of naturally found goods, and the health of living creatures. Because of the assurance of a balanced climate, abundant natural resources, and skilled labor force, environmental governance helps to attain the SDGs (e.g., good health, well-being, equal distribution of resources, clear water and food, and a clean and sustainable production process). The study findings were also supported by the research findings of Al-Saidi (2021), which focused that the implementation of environmental regulations set by business enterprises themselves internally or environmental regulations proposed and administered by a specific external regulatory authority ensures the sustainable development for the country by enhancing the production activities, raising employment and reducing poverty. Hence, the environmental governance on the part of businesses guarantees SDGs' achievement.

The study results showed a positive association between the social criteria of ESG and the achievement of SDGs, therefore accepting H2. The results agreed with the views of Wiegleb and Bruns (2018) in an article for the analysis of social governance and its role in achieving the SDGs. The formation and execution of regulations for promoting positive relationship between the organization and stakeholders like suppliers, employees, investors, financers, customers, and the general public benefit both the organization and the stakeholder, encouraging the many aspects of SDGs. The literary views of van Zanten and van Tulder (2021) regarding the social governance in ESG and the achievement of SDGs advocated the same results as these ones are in the present study. van Zanten and van Tulder (2021) argued that when the business management developed a positive behavior towards the company employees while forming or applying the business policies, they can achieve SDGs (e.g., the goals of reduction of poverty, reducing hunger, good health, and improved wellbeing) with the provision of equal opportunities of employment, clean work environment, and financial support besides the actual salary. The study results were also supported by the study of Costa et al. (2021), who mentioned that organizations must try to develop smooth relations with the suppliers of raw materials or other resources. These relations assist the organization in maintaining the quality of the products and services without polluting the environment and damaging the stakeholder's health which are the key factors of sustainable development of the country. The results matched with the past study of Jonsdottir et al. (2021), which highlights that when the business organizations follow the standards of social relations and feel its social responsibilities towards the stakeholders, it develops effective communication and contacts with the investors who are the source of funds. In this situation, SDGs can be easily achieved.

The results showed a positive link between corporate governance, a dimension of ESG, and the achievement of SDGs, thus accepting H3. These results aligned with the previous study of Buhmann et al. (2019), who examined the ESG role in the SDGs achievement. This study implied that the effective administration of different departments of the business organization with a sense of responsibility towards the

wellbeing of the stakeholders and the interest of the organization itself, improves the social and environmental performance of the organization along with the economic performance. Thus, increasing the chances to achieve the SDGs. These results were also supported by the study of Rosati and Faria (2019), which highlighted that businesses that adopt suitable communication networks within the organizations, in which the communication is smooth and the employees, even at the lower level, are allowed to share their ideas, there is equality, creativity and innovation, and responsible production of goods and services. It highlighted that effective corporate governance leads to the achievement of SDGs. The findings agreed with the past study of Lashitew (2021), who stated that the employees play a vital role in the sustainable development of business enterprises, and corporate governance under the ESG promotes effective human resource management through improved training, rewards, compensation, and the provision of support and life security. Thus, countries applying the ESG have a large share in the achievement of SDGs. These results were also in line with the recent study of Kørnøv et al. (2020), which is about the role of ESG score in getting SDGs. This study highlighted that corporate governance in ESG tries to remove the inequality among the executives and other employees in different business areas by giving them equality rights and financial support, which serves the SDGs of justice, equality, and provision of equal rights.

As per these study results, there is a positive association between economic growth and the achievement of SDGs, therefore accepting H4. These results matched with the study of Zafar et al. (2019), which showed that when there is high economic growth, there is an increasing trend of production of goods and services within the economy. For undertaking the increased productive activities, a large number of labor-force is required. This gives employment opportunities and raises the workers' standard of living through increased employment, salaries, and bonuses. Hence, the increase in the growth rate helps to achieve the SDGs goals (e.g., no poverty and zero hunger). Similarly, the study of Alola et al. (2019) supported these results by suggesting that in economies having high growth, most of the enterprises in all economic sectors are making progress and are able to adapt the productive mechanisms, up-to-date resources, and modern technologies. Consequently, the SGDs quality education, decent work, economic development, industry, innovation, and infrastructure can successfully be achieved.

6. Conclusion

Though the member countries of ASEAN regions are progressive because of the exponential increase in economic activities, a large circle of stakeholders, and increased technology use within the economies, it becomes difficult for them to attain the SDGs. SDGs is wholesome for the progress of a country, and the achievement of SDGs can only be a source of survival for the countries in the international market. This study was aimed to minimize the difficulty of achieving the SDGs and to secure the country's position across the world. The research was conducted to examine the effectiveness of ESG dimensions like environmental governance, social governance, and corporate governance along with economic growth in obtaining the SDGs. A

quantitative research technique was applied to delve deep into ASEAN economies so that the degree of influence of ESG dimensions like environmental governance, social governance, corporate governance, and economic growth on the achievement of SDGs can be examined. The results found indicated a positive link among ESG dimensions, i.e., environmental governance, social governance, and corporate governance, along with economic growth and the achievement of SDGs. The results also indicated that when the commercial enterprises take care of the environmental through ecological friendly resources and practices and regulate the effectiveness of these practices, they can have a better share in achieving the SDGs. The results also revealed that the SDGs majority are based on the welfare of the public and stakeholders of the business organizations through effective communication and relationship between them. Thus, social governance ensures the achievement of SDGs. The study inferred that corporate governance, like the effective management of the organization, which includes the financial management, resources allocation, risk management, organizational structure, work environment, and performance of employees, leads the organization to make a large share to the SDGs achievement. The study concluded that in countries with high economic growth, ESG implementation is high and is more likely to achieve the SDGs.

Though the current study has theoretical and empirical implications, several limitations are still associated with it, which serve as a question mark for the reliability and validity of the study. The achievement of SDGs is a broad concept that requires improvement in many factors, but the study dealt with only ESG dimensions like environmental governance, social governance, and corporate governance for analyzing the country's capacity to achieve the SDGs. Unfortunately, only a limited number of factors in relation to the achievement of SDGs were analyzed and the authors hoped to analyze a greater number of factors that can affect the attainment of individual SDGs. The authors carried out this research about the impacts of ESG dimensions like environmental governance, social governance, corporate governance, and economic growth on the achievement of SDGs for only a limited time. The analysis of the selected countries during a specific period can provide only limited data, not enough to meet the requirement of an effective study. Therefore, the authors need to acquire a more comprehensive and reliable data through research of selected countries for an extended period, so that the study's results can be applied for a longer period.

7. Implications

The current study has theoretical implications with large additions to the literature. The subject of the study is the achievement of SDGs. This study focuses on the role of ESG in achieving the 17 SDGs which were proposed by the UN General Assembly in sustainability agenda 2030. It examines the impacts of ESG dimensions like environmental governance, social governance, and corporate governance along with economic growth on the achievement of SDGs. ESG is a set of standards for the sustainable performance of a particular organization, and it has been mostly addressed as a complete term to determine the country's capacity to achieve the

SDGs. This study initiates to determine ESG with its dimensions of environmental governance, social governance, and corporate governance to determine the country's progress in achieving the SDGs. Many studies may have addressed ESG implementation as the driver of progress in achieving SDGs, but little research was conducted on ESG implementation with economic growth analysis for determining the achievement of SDGs. The analysis of ESG implementation with economic growth for achieving SDGs is a great contribution to the literature. The present study has a great significance in emerging countries which are major business units and has many industries, having to interact with the stakeholders and use energy resources with other resources and technologies, which could affect the environmental and social progress. The government entities, economists, and even the individual business enterprises could have guidance from this study while making policies for achieving the SDGs. The study presents an effective way to gain the SDGs. The current article provides help to new researchers conducting research on achieving SDGs and guides the policymakers in establishing policies regarding achieving the SDGs through ESG. One of the study implications is that the government must form an environmental regulatory authority to encourage the regulations for high environmental performance and must motivate them to develop good relations with stakeholders and take care of their wellbeing.

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