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Do ESG Strategies Foster or Impede Corporate Innovation: Evidence from Asia-Pacific

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Abstract

This study examines the joint and separate effects of Environmental (E), Social (S), and Governance (G) scores on corporate innovation. Using a 5,566 yearly-firms observation from listed firms operating in the Asia Pacific region over 2011–2020, the study finds that the aggregate ESG score and its two sub-pillars (social and governance) have insignificant impacts on corporate innovations. However, environmental activities have a significant and negative impact on corporate innovation. This finding implies that environmental activities stipulate corporate innovation as it deviates firms' resources from the value-added activities that enhance innovation. Hence, firms need to consider the trade-off between engaging highly in environmental activities and impeding corporate innovation. These findings enrich the literature of ESG and innovation and provide valuable information for firms and their stakeholders, including regulators.
Keywords: Corporate innovation, ESG, Environmental, Social, Governance, Asia-Pacific.

I. INTRODUCTION:

Corporate innovation has received great attention as firms need to be innovative to maintain competitive advantages [1]. In today's ever-changing business environment, firms have to innovate to survive and thrive [2]. Several studies have argued that engaging in social responsibility activities is one channel that embraces firms to be innovative [2][3][4] CSR activities such as the environmental projects could benefit the firms as such activities help the firms be more efficient, get more market access, and have a better engagement which are all vital channels for innovation. On the contrary, some studies argued that CSR activities hinder corporate innovation [5][6][7] This argument is justified as more engagement in CSR lowers the firm's performance and negatively affects its competitiveness. It is supported that CSR activities stipulate corporate innovation as it deviates firms' scarce intangible and tangible resources from the value-added activities that enhance firms' innovation [18]

Given the inclusive findings on whether corporate social responsibility performance hinders or fosters innovation, this study aims to revisit this unresolved issue by using a data set across from the Asia Pacific region and examining the ESG performance jointly and separately. This study is unlike studies that provide evidence from a single-country context, as conducting a study using a global data set provides an in-depth investigation of whether the effect of ESG on innovation is different due to specific country-level factors such as economic development. Chkir *et al.* [2] stated that the literature on CSR and innovations is dominated for developed countries, with limited studies focused on emerging economies. A study done by Visser [29] argued that CSR emerging countries is still in its reactive stage compared to developed economies in a proactive stage. Furthermore, among these studies that focus on emerging economies, most of the studies focused on the China [8] [9]. A recent study by Chkir *et al.* [2] focused on 20 countries, including developed and emerging economies. However, the data set covers the period of 2002-2013. Thus, this study is motivated by Chkir *et al.* [2], where a more inclusive data set is used across 94 countries and over 2011-2020. Additionally, this study examined ESG jointly and separately compared to Chkir *et al.* [2] study that ignored the governance aspect and focused on environmental and social performance. Although, the governance dimension plays a crucial role as firms with effective corporate governance are more likely to be innovative, which is also in whit the agency theory, resource-based view, and stakeholder theory.

This study contributes in several ways. Firstly, the study contributes to the current debate on compatibility of ESG and corporate innovation. The findings in the literature are inconclusive [3] [4] [5] This study is motivated by the call of Chkir *et al.* [2] that cross-countries evidence provides better practical implications. Secondly, to the best of the researcher's knowledge, this study is the first to examine the effect of ESG strategies jointly and separately on corporate innovation in the Asia-Pacific setting. Thirdly, this study enriches the literature by supporting the theoretical argument that governance performance is the aspect of ESG that fosters innovation. It is in line with the stakeholder theory, resource dependence view, and agency theory.

This study is structured as follows. First, the introduction is presented, then the literature review and hypotheses developed section is presented. In the subsequent section, the methodology used is elaborated, followed by a section for the findings. Lastly, the conclusion section is presented, including a summary of the main findings and the theoretical and practical implications.

II. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

In today's world, sustainability is a crucial term that firms are targeting. In addition, spending more on research and development (R&D) is crucial to surviving in such a dynamic and competitive environment. These R&D expenditure aims to generate long-term benefits. However, there are risks inherent with these expenditures reflected by the delayed benefits. The increased importance of ESG and the dynamic and competitive environment expose firms to two different moral and strategic pressures [2]. The moral pressure is in line with the stakeholders' theory that firms abide to be socially responsible. The strategic pressure is in line with the argument that the ESG activities should be designed to foster differentiation in its products or services, consequently enhancing the firms' competitiveness. It is argued that firms need to innovate to maintain their position or move ahead of their competitors. This implies that firms look at ESG activities as part of their strategies [10]

Being socially responsible firms as a strategic approach leads to innovations as the activities related to ESG create differentiation in the firms' product, service, and process [11]. In the same vein, Mishra [12] supported that firms that innovate more exhibit better corporate social responsibility performance due to the benefits gained from engaging in social responsibility activities. Several studies have supported the positive impact of ESG on firms' performance [13]; [14]. These findings support the theoretical arguments that firms that are better in terms of ESG are likely to be more innovative.

Another channel that benefits from engaging in social responsibility activities are that more socially responsible firms are likely in a better position to be innovative due to its ability to attract and retain more productive employees and enable more creative involvement. Wu *et al.* [15] supported this benefit aspect by providing evidence that socially responsible firms are acquiring more intangible resources crucial for innovation. Firms that engage in environmental activities as part of its strategic social responsibility would benefit. These would be considered a learning lab that helps firms be innovative. This implies that social and environmental activities are a source of inspiration for novel innovations [16]

Porter and Kramer [17] justified that positive impact is from the notion of shared value creation. It is argued that the CSR activities leads to a competitive advantage and to innovation in the processes [18]. Costa *et al.* [19] and Herrera [20] justified that engaging in CSR and continually evaluating corporate influences and relationships with stakeholders and the environment significantly enhances innovation. In line with the stakeholder theory, corporate social responsibility affects corporate innovations positively. However, another stream of studies supported that CSR activities hinder firms from undertaking required and significant transformations that enhance corporate innovation [5] [6] also argued that investing more in (R&D)

is more likely not aligned with the CSR agenda. Hence, combining both innovation and CSR objectives is a challenging task. Miles *et al.* [21] argue that CSR activities impede innovation as firms engaging more in environmental activities mainly aim to satisfy stakeholders, which distract firms from their real business problem. In line with the stakeholder theory and previous empirical studies, the hypotheses are formulated as follow:

Hypothesis 1: ESG strategies have significant relationship with corporate innovation.

Hypothesis 2: Environmental strategies have significant relationship with corporate innovation.

Hypothesis 3: Social strategies have significant relationship with corporate innovation.

Hypothesis 4: Governance strategies have significant relationship with corporate innovation.

III. METHODOLOGY

This study collected a data set from Bloomberg that covers listed firms in the Asia Pacific region. The period of the study is from 2011 to 2020, with yearly-firm observations of 5,566. Bloomberg is a data provider is used by several studies such as Chiaramonte e*t al.* [22] and Giannarakis *et al.* [23]. To achieve the study objectives, the multivariate regression model is constructed as follows:

$$INO_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 BODSIZE_{it} + \beta_3 BODIND_{it} + \beta_4 SIZE_{it} + \beta_5 ROE_{it} + \beta_6 LEV_{it} + \beta_7 TANG_{it} + \sum_{i=1}^{n} DEV + \sum_{i=3}^{n} YEAR + \sum_{i=9}^{n} INDUSTRY + \sum_{i=4}^{n} COUNTRY + \varepsilon \quad (1)$$

$$INO_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 G_{it} + \beta_4 BODSIZE_{it} + \beta_5 BODIND_{it} + \beta_6 SIZE_{it} + \beta_7 ROE_{it} + \beta_8 LEV_{it} + \beta_9 TANG_{it} + \sum_{i=1}^{n} DEV + \sum_{i=3}^{n} YEAR + \sum_{i=9}^{n} INDUSTRY + \sum_{i=4}^{n} COUNTRY + \varepsilon \quad (2)$$

Where INO_{it} is the corporate innovation level for firm i at year t measured by the total research and development expenses divided by the firm's total assets. This measurement is used by several studies, such as Huang *et al.* [24]. ESG_{it} is the total score of enviroemental, social and governance disclosure; $BODSIZE_{it}$ is the $SIZE_{it}$ of the board; BODIND is the independence of the

board, $SIZE_{it}$ is the total assets of the firm; ROE_{it} is the firm's total return divided by total equity; LEV_{it} is firm's total debts divided by total assets; TANG, is the firms' property, plant and equipment divided by total assets; and ε is the error term. This model controls for the year, country, and industry fixed effects to filter the time-invariant factors and capture unobserved characteristics of the firm. Additionally, the study models control for the economic development level by assigning a value of one for the Asia-Pacific developed economies; otherwise, a value of zero is given. To ensure that there is no issue with the outlier, all continuous variables were winsorized at the 1st and 99th percentiles.

IV. RESULTS AND DISCUSSION

Table 1 below presents the descriptive statistics of the study variables. It is shown that the firms' innovation measured by R&D expenses represents 0.002 of the firms' total assets with minimum and maximum levels of zero and 0.165, respectively. In terms of ESG, the average score is 26.864 with a minimum and maximum of 10.744 and 60.766, respectively. Table 1 also shows that, on average, firms have a higher governance score, 48.994, compared to 17.773 and 25.011 for environmental and social, respectively.

Table 1: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
INO	5566	0.002	0.016	0	0.165
ESG	5566	26.864	10.657	10.744	60.766
E	5566	17.773	14.723	1.55	63.365
S	5566	25.011	12.652	3.509	66.667
G	5566	48.994	6.511	32.143	75
BODSIZE	5566	8.969	2.583	3	17
BODIND	5566	37.368	20.614	0	100
ROE	5566	8.324	16.298	-127.124	66.233
SIZE	5566	7.2	1.616	2.21	11.288
LEV	5566	21.097	16.803	0	84.938
TENG	5566	0.331	0.202	0.001	0.874

Table 2 shows further details on the data set used in this study. Across Asia Pacific countries, the data used covers 2011-2020 over ten sectors based on Bloomberg classification. It is also

reported that 58.66 percent of the observation is from the Asia Pacific developed economies, and the remaining is from the Asia Pacific emerging economies.

Table 2: Descriptive of the data set

Panel 1: Industry	Freq.	Percent	Cum.
Basic Materials	809	14.53	14.53
Communications	228	4.10	18.63
Consumer, Cyclical	1117	20.07	38.70
Consumer, Non-cyclical	951	17.09	55.79
Diversified	25	0.45	56.23
Energy	207	3.72	59.95
Industrial	1765	31.71	91.66
Technology	264	4.74	96.41
Utilities	200	3.59	100.00
Total	5566	100.00	

Panel 2: Year	Freq.	Percent	Cum.
2011	524	9.41	9.41
2012	299	5.37	14.79
2013	78	1.40	16.19
2014	604	10.85	27.04
2015	830	14.91	41.95
2016	546	9.81	51.76
2017	332	5.96	57.73
2018	184	3.31	61.03
2019	976	17.54	78.57
2020	1193	21.43	100.00
Total	5566	100.00	

Panel 3: Region	Freq.	Percent	Cum.
Asia Pacific Emerging	2301	41.34	41.34
Asia Pacific Developed	3265	58.66	100.00
Total	5566	100.00	

The Pearson correlation is carried out to identify the preliminary relationships between the study variables, as shown in Table 3. It is shown that the main variables of this study (ESG, E, S, and G) are negatively correlated with corporate innovation. This provides preliminary findings on the possible relationships. Table 3 also reports the correlation between the other independent variables. It is shown that the highest correlations are between the ESG and its pillars which is likely to happen. Hence, this study would run the regression analysis separately to eliminate any multicollinearity issue.

In this section, the findings of this study are reported in Table 4. The first model regressed the impact of ESG and other control variables. It is shown that ESG is negatively affecting corporate innovation. However, it is insignificant. This implies that there is no relationship between the aggregate score of ESG and corporate innovation in the Asia-Pacific region. Hence, the first hypothesis is rejected. In the second model, the dimensions of ESG were regressed jointly. It shows the environmental score negatively affects corporate innovation and at a significant level of 5 percent. Hence, the second hypothesis is accepted. The second and third hypotheses are unsupported. This implies that environmental performance is the one that hinders corporate innovation. The three variables (E, S, and G) were regressed separately, as shown in Model 3, 4, and 5, respectively. These findings confirm that corporate innovation is impeded by the environmental disclosure where the coefficient of E is statistically significant and negative.

Table 3: Pairwise Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) INO	1.000										
(2) ESG	-0.075*	1.000									
(3) E	-0.064*	0.945*	1.000								
(4) S	-0.054*	0.782*	0.553*	1.000							
(5) G	-0.043*	0.662*	0.448*	0.487*	1.000						
(6) BODSIZE	-0.058*	0.266*	0.234*	0.170*	0.172*	1.000					
(7) BODIND	-0.013	0.162*	-0.072*	0.281*	0.299*	-0.143*	1.000				
(8) ROA	-0.035*	0.032*	0.012	0.073*	0.045*	0.092*	0.010	1.000			
(9) SIZE	-0.160*	0.556*	0.472*	0.473*	0.393*	0.433*	0.107*	0.074*	1.000		
(10) LEV	-0.036*	0.106*	0.069*	0.093*	0.101*	0.140*	0.081*	-0.135*	0.284*	1.000	
(11) TENG	-0.051*	0.169*	0.100*	0.142*	0.119*	0.114*	0.096*	-0.098*	0.206*	0.391*	1.000

** p<0.05*

Previous studies have inconclusive findings, as some studies supported that positive impact [10] [25] [2]. These studies supported the theoretical argument that firms with a strategy for engaging in social responsibility activities are likely to spend more on innovation. It is also explained by Surroca *et al.* [26] that engaging in social responsibility projects might require firms to invest in advanced technologies, which consequently help them to innovate in their products, services, or processes and be more proactive. Nidumolu *et al.* [27] supported that stringent CSR enables firms to gain a competitive advantage, fostering innovation capability. A study done by Broadstock *et al.* [28] argued that ESG activities catalyze a firm's innovation capacity creation.

Table 4: Regression Analysis

	(1)	(2)	(3)	(4)	(5)
	$INO_{i,t}$	$INO_{i,t}$	$INO_{i,t}$	$INO_{i,t}$	$INO_{i,t}$
$ESG_{i,t}$	-0.0000352				
	(-1.39)				
$E_{i,t}$		**-0.0000423****	**-0.00003***		
		(-2.00)	**(-1.68)**		
$S_{i,t}$		0.0000166		-2.56e-06	
		(0.70)		(-0.12)	
$G_{i,t}$		0.0000353			0.000013
		(0.86)			(0.33)
$BODSIZE_{i,t}$	0.0002249**	0.0002182**	0.000223**	0.000224**	0.0002226**
	(2.32)	(2.25)	(2.30)	(2.31)	(2.30)
$BODIND_{i,t}$	0.000017	0.0000146	0.0000166	0.0000162	0.0000154
	(0.95)	(0.81)	(0.93)	(0.91)	(0.85)
$ROE_{i,t}$	-3.75e-06	-4.78e-06	-4.01e-06	-4.29e-06	-4.49e-06
	(-0.28)	(-0.35)	(-0.30)	(-0.32)	(-0.33)
$SIZE_{i,t}$	-0.001613***	-0.001647***	-0.0016003***	-0.0017271***	-0.0017535***
	(-8.65)	(-8.79)	(-8.74)	(-9.77)	(-10.12)
$LEV_{i,t}$	0.00002	0.0000203	0.0000199	0.0000211	0.0000213
	(1.36)	(1.38)	(1.36)	(1.43)	(1.45)
$TENG_{i,t}$	-0.0010457	-0.0009758	-0.0010049	-0.0011442	-0.0011512
	(-0.85)	(-0.80)	(-0.82)	(-0.94)	(-0.94)
$CONS_{i,t}$	0.0098679***	0.0117179***	0.0133264***	0.0137146***	0.0132047***
	(1.09)	(4.64)	(6.92)	(7.14)	(5.48)
Observations	5566	5566	5566	5566	5566
R-squared	0.039	0.039	0.039	0.038	0.038
Industry Dummies	YES	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES	YES
Country Dummies	YES	YES	YES	YES	YES

Economic Development Dummy	YES	YES	YES	YES	YES

INO is corporate innovation; ESG is the environmental, social, and governance total score; E is the environmental score; S is the social score; G is the governance score for a company $_i$ at year $_t$; SIZE is the log of the book value of the total assets; ROE is the firm's profitability which is measure by the net income divided by total equity; LEV is the book value of total liabilities divided by the book value of the total assets; TANG, or asset tangibility, is the net property, plant, and equipment divided by the total assets. BODSIZE is the number of directors on the firm's board; BODIND is the percentage of independent directors on the firm's board. Note: *, **, *** are significant at 10%, 5% and 1% levels, respectively. *t values are in parentheses; *** p<.01, ** p<.05, * p<.1*

IV. CONCLUSION

Corporate innovation and sustainability are crucial in today's competitive environment. Several studies have examined the determinants of corporate innovation. However, limited studies have provided cross-country evidence and examined the impact of ESG jointly and separately. Although firms need to enhance their ESG performance, corporate innovations should not be impeded by ESG. This study provides empirical evidence from the Asia-Pacific region and finds that the ESG aggregate score does not impact corporate innovation. However, firms that engage highly in environmental activities are experiencing less innovation level. Furthermore, engaging in social and governance activities have insignificant impacts on corporate innovation. These findings enrich the literature and provide practical implications for firms and regulators.

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