

PRODUCT MARKET COMPETITION, CORPORATE GOVERNANCE AND ESG

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ABSTRACT

This paper examines whether product market competition is associated with Environmental, Social, and Corporate Governance (ESG) and whether corporate governance moderates the effect of product market competition on ESG. Analysis involving 22,897 firm-year observations from 37 countries shows that companies with higher product competition have lower ESG and those with higher corporate governance have higher ESG. The results also indicate the moderating effect of corporate governance, as the negative relationship between product market competition and ESG diminishes for companies with higher corporate governance. The results remain robust in additional analysis using alternative measures for product market competition and corporate governance. The findings support the joint effect of product market competition and corporate governance in determining corporate performance in ESG. The findings reflect the various pressures influencing ESG practices, and on how the strength of corporate governance plays a vital role in ensuring strategic ESG being employed for the sustainable performance of companies. The findings have implications on companies that want to factor ESG into their plans especially to reinvent their companies for the period that follows the COVID-19 pandemic.

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Keywords: Corporate governance, ESG, product market competition

INTRODUCTION

Product market competition (PMC) is a double-edged sword on the corporate environment, social and governance (ESG)¹ performance; the strategic view asserts that competition leads to value-enhancing ESG (Platonova et al., 2018; Friede et al., 2015), while the altruistic view indicates that competition deters companies from focusing on ESG (Baron et al., 2011; Gupta & Krishnamurti, 2016). Nevertheless, ESG is a complex concept that the implementation itself is challenging. The performance of companies in meeting their ESG obligations is deemed important in meeting their sustainability agenda. While companies that conduct their business in line with the principles of sustainability can create long-term value for their shareholders (Fatemi & Fooladi, 2020), challenges in integrating ESG may undermine the expected benefit of the sustainable practices such as the failure to gain financial success (Albertini, 2013; Crisóstomo et al., 2011).

As companies continue to face intense competition, especially in the midst of the challenges due to global economic uncertainty from the US–Chinese trade war and the 2020 COVID-19 pandemic, it becomes more important to ensure that corporate ESG propositions can translate into the maximisation of the wealth of shareholders. Hence, this study considers the perspective of corporate governance in leveraging the external pressures from PMC towards better formulation and of strategic decision-making processes in ESG. More specifically, this study examines the joint effect of PMC and corporate governance in influencing ESG among companies worldwide. Product market competition is an external driver that pressures companies to strategise on ESG in order to win against the competitors, while corporate governance is the internal driver in overseeing that the efficacy of the strategy being developed and implemented to integrate ESG in companies and operations. This study attempts to add to the mixed findings on PMC and ESG (e.g., Flammer, 2015) by highlighting on the ability of the system that can monitor the management of companies in a highly competitive environment to perform well in ESG.

This study investigates whether PMC is associated with ESG and whether corporate governance moderates the relationship between PMC and ESG. The expectations are set as such due to several factors. First, there are movements towards more corporate commitment on ESG, including those of the stock market regulators that embark on the concept of “sustainable investing” to address needs

of investor that seek both adequate financial returns and long-term positive impact on the community and environment. An example in the global context is the Addis Ababa Action Agenda that serves as a global framework in aligning all financing flows and policies with economic, social and environmental priorities to support the 2030 Agenda for Sustainable Development. Despite the initiatives on ESG commitment, there is a slow progress in global movement in sustainable investing partly due to the belief that ESG performance decreased shareholders value due to the high cost of adhering to ethical standards, causing some companies to continue to resist from integrating ESG in corporate strategy. Second, understanding the connection between PMC and ESG provides possible avenues to compel companies on focusing exclusively in developing a differentiated image of ESG performance in a way of a more cost-efficient use of financial resources, hence promoting the potential long-run premium of ESG. The common reason is that the measures to improve corporate governance should propel socially responsible practices among companies in a highly competitive market. Given that the intensity of the external pressure affects ESG performance, well-governed companies in the competitive market should be able to embrace ESG without much wary of the ESG cost penalty, and eventually progress towards greater earning growth as compared to less responsible companies.

This study assesses PMC, as an external driver, and corporate governance, as an internal driver, in explaining ESG performance across companies in an international setting. The analysis is based on a large sample of 22,897 firm-year observations from 37 countries during the period 2009–2018. The findings indicate that companies with higher PMC are those with lower ESG, but the effect of PMC on ESG is moderated by the quality of corporate governance. More specifically, the negative relationship between PMC and ESG diminishes in companies with better corporate governance quality. Hence, the strength of corporate governance serves in monitoring managers in highly competitive product market towards streamlining ESG in corporate strategy. In testing for the robustness of the main results, alternative tests were performed by using alternative measures of product market competition, corporate governance and sustainability scores. The results continue to find a negative relationship between PMC and ESG, and the moderating effect of corporate governance on the association between PMC and ESG. Overall, this study provides international evidence on the joint effect of PMC and corporate governance in promoting better ESG performance.

This paper contributes to the literature in the following ways. First, analysis using an international dataset allows us to contribute to prior studies on the link between PMC and corporate social and environmental performance (e.g., Ferrero-Ferrero et al., 2015; Post et al., 2011) and corporate governance and

corporate social and environmental performance that often employ single- country setting. We are able to reiterate findings on the negative effect of PMC on ESG, as shown in our findings that involve companies in various market and institutional contexts. Accordingly, our study reinforces the altruistic view of PMC in the aspect of ESG performance. Second, we employ the ESG data from Thomson Reuters (Refinitiv) as a reflection of corporate performance in meeting their ESG obligations, as compared to prior studies that employ various dimensions of corporate sustainability performance (e.g., Setó-Pamies, 2015) including those of hand-collected data. As ESG performance is a complex concept, the use of the information from the database provides a layer of assurance in terms of the accurateness of the data in reflecting the ESG context that we aim to cover. Thirdly, our analysis on the joint effect of PMC and corporate governance on ESG reflects an effort to contribute to the perspective that ESG strategies reflect contextual factors (Morioka & Carvalho, 2016). More specifically, we consider the joint effect of the external driver, the PMC, and the internal driver, the corporate governance on ESG and show the moderating effect of corporate governance on PMC-ESG, relationship.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Companies engaged in ESG practices with the aim to enhance their long-term value, especially in ensuring the sustainability of the companies. There are views that meeting the sustainability agenda is perceived as being important by both the top management (PricewaterhouseCoopers, 2013) and the customers (Edelman Trust Barometer, 2014). In this study, ESG refers to the performance of companies in meeting the ESG obligations. The environmental element covers environmental performance, in relation to energy and resources being used, the emissions and waste being discharged, the associated risk from the environmental effect as well as the conservation of its natural and environmental resources. The social element is the performance associated with the company's relationships with other businesses and communities, referring to their attitudes towards diversity, human rights and consumer protection such as supply chain management and policies on health and safety protection. The governance element refers to the corporate governance performance of companies, including key measurements that evaluate the quality of their management systems as well as their ability to manage long-term risks and opportunities. These elements of ESG serve as the framework to evaluate the impact of the overall corporate practices on their financial performance and operations.

In general sense, meeting social and environmental obligations enhances the reputation of the companies (Rezaee, 2016). Studies by Roberts and Dowling (2002) and Hussainey and Salama (2010) indicate that ESG practices can provide companies with a sustainable competitive advantage because ESG practices can enhance corporate reputation and increase consumer confidence in the value of the products. Management can also improve the efficiency of the operations and is able to develop competitive products through the strategic integration of ESG in managing the companies. As stated by Porter and Kramer (2011), companies increase their economic value through cost reduction such as by controlling corporate waste. Xie et al. (2019) find that the policies and operations of companies that integrate the ESG concept enhance the degree of their competitiveness in the capital market as they offer comfortable working conditions that can build good workers within their operations. According to Porter and van der Linde (1995), involvement in corporate sustainability practices can stimulate innovation, strengthen a company's resilience to external shocks, and motivate employees to exert greater effort. Prior studies highlight that corporate ESG practices are important in the capital market, as investors take into consideration the sustainability data in their investment decision process (Kim et al., 2012; Khan et al., 2016) as investors react positively to ESG performance (Nekhili et al., 2019).

While ESG is deemed important, integrating sustainability into corporate strategic planning is a challenge. There are concerns that companies might experience a reduction in profitability and competitiveness because the fulfilment of the responsibilities to the shareholders, social and the environment can create additional costs to them (Friedman, 2007). There are views on the issues associated with embedding ESG into products and services and communicating sustainability to consumers (GlobeScan 2019). While sustainability practices are value-enhancing (Friede et al., 2015; Platonova et al., 2018), there is also evidence on the inability of firms to leverage on their sustainability practices in a way that can translate into financial success (Albertini, 2013; Crisóstomo et al., 2011).

PMC and ESG

PMC serves as an effective driver towards better corporate efficiency (Schmidt, 1997) and productivity growth (Nickell, 1996), and an effective structural reform in promoting economic growth (The Organisation for Economic Co-operation and Development [OECD], 2015). In strengthening corporate performance, PMC has become an important motive for firms to reinforce their strategic consideration in ESG practices. For example, in relation to consumers' welfare, the strategy to fulfill consumers' expectations on product quality and safety would enable companies to maintain their competitive position (Dupire & M'Zali, 2018).

Strategising on ESG can enhance a company's competitiveness, through high employee motivation, efficient use of energy and materials, and opportunities to discover new market segments.

Acquier et al. (2017) find that firms tend to apply the CSR policies to offer a market premium when there is a highly competitive pressure in the market. A high level of pressure from competitors in a high PMC (Flammer, 2015) influence companies to undertake a more strategic CSR approach (Dupire & M'Zali, 2018; Fernandez-Kranz & Santalo, 2010) through efficiently operating their business and practising the environment-cost balance in their operations (Smith et al., 2010). Further, Gupta and Krishnamurti (2018) assert that companies would be highly engaged with sustainability strategy due to intense competition, as to differentiate themselves from their rivals. PMC can encourage the offering of high-quality product and product differentiation to consumers (Acquier et al., 2017). Declerck and M'Zali (2012) find that an increase in product competition will improve corporate performance specifically in relation to the quality of the products and their safety.

Companies engage in sustainability practices to strengthen relationships with stakeholders and to honour commitment with them in order to not lose them to competitors, as well as to gain greater product pricing power through the differentiation approach (Liao et al., 2015). Brammer et al., (2006) and Kuokkanen and Sun (2020) find that companies address the needs of their stakeholders by trying to improve CSR practices that are related to the consumers and employees when there is a pressure from competition. Dupire and M'Zali (2018) show that PMC can encourage social performance, although the effects may be different based on the industry specificities and dimensions of CSR.

The above views are in line with the strategic view of PMC, evidenced by support on the positive relationship between competition and corporate social responsibility, as shown in Flammer (2015) and Fernández-Kranz and Santalo (2010). The strategic view of PMC asserts that CSR activities are strategic investment tools that address stakeholders' needs and signal competitiveness (Harjoto & Jo, 2011; El Ghouli et al., 2011). Nevertheless, the strategic view of PMC does not always hold as there are evidence that PMC does not produce expected outcome in terms of ESG performance. An alternative view is the altruistic view, of which commitment towards ESG is perceived as an inefficient use of resources that reduces profit.

In support of the altruistic view, Baron et al. (2011) show that the competitiveness of industries has little effect on corporate social performance.

Companies in competitive industry tend to engage in less CSR (Gupta & Krishnamurti, 2016) as the benefit of engaging in CSR is more pronounced for firms in non-competitive industry (Newman et al., 2020). According to Lin et al. (2020), intense competition would force companies to focus on short term survival such as by forgoing investment for sustainability activities or engage in unethical behaviour. Managers may also tend to overinvest in CSR for the sake of enhancing reputation, and accordingly increase the agency costs as they extend their discretionary power over corporate resources for that purpose (Barnea & Rubin, 2010).

In sum, empirical evidence is indicative of both views; that PMC may lead to the positive (Flammer, 2015) and the negative (Gupta & Krishnamurti, 2016) impact on ESG. While higher intensity of PMC may encourage companies to practice strategic ESG as to reap the benefits, pressure from competition may also result in lesser commitment in ESG. In the light of the increased intensity of competition worldwide (Dobbs et al., 2015), this study asserts that companies face greater external pressure to meet the objective of maximising the return of the shareholder, of which such pressure requires them to also address the need of the stakeholders by integrating sustainability strategies into the business. Using international dataset, this study offers additional insights in assessing whether and how PMC affects the performance of the companies specifically on their ESG. Based on the above arguments, this study presents the first hypothesis as follow:

H1: There is a positive association between product market competition and ESG.

PMC, Corporate Governance and ESG

Despite the importance of ESG, the implementation and execution of the concept itself is complex because companies face various pressures that shape their involvement in social and environmental activities (Gerner, 2019; Ferrell et al., 2016). Aside from the external pressure arising from PMC (that is addressed in the hypothesis above), ESG is conditional on the internal pressure that serves to oversee that the aspects of sustainability are embedded in companies. Yu and Liang (2020) assert that the complexities associated with corporate sustainability practices give rise to the need for proper implementation and control of the sustainability strategies, with the goal of improving sustainability performance and reaping the expected benefits. Accordingly, Alsayegh et al. (2020) identify that companies need to have an effective system of corporate governance, such as a good board structure in place, to increase the consumers' trust and to enhance corporate innovations. Investors view ESG as the boardroom agenda as it is

critical for them to understand the full corporate risk profile and risk management practices in relation to the broader industry, regulatory and societal risks that drive long-term sustainable performance and shareholder value.

In this study, corporate governance mechanisms are deemed as important elements in successful efforts towards ESG. Prior studies, employing a wide range of corporate governance mechanisms, have shown that CSR practices are affected by the quality of a firm's internal governance mechanisms with the evidence that better-governed companies are more inclined to pursue a more socially responsible agenda through increased CSR practices (Ntim & Soobaroyen, 2013, Cai et al., 2012). Harjoto and Jo (2011) show that the CSR choice is positively associated with governance characteristics, including board independence, institutional ownership, and analyst following. Martin and Herrero (2020) confirm that gender diversity and the existence of a corporate social responsibility committee are positively associated with the environmental performance.

An aspect that is important in corporate governance is the role of the board of directors (BOD), as the source of strategic leadership that is important in strategising for corporate practices and act as disciplinary managers through their active monitoring role (Castellanos & George, 2020). The BOD set the tone in corporate ESG performance by being responsible in developing and overseeing the management, culture and governance of ESG. Nadeem et al. (2017) state that, in relation to ESG, a diverse BOD plays a vital role in the management of the critical resources needed for survival and to enhance corporate sustainability practice. The ability and competency of the BOD shall act as an internal driver in ensuring that management embeds sustainability as part of the corporate strategy and in overseeing the implementation of the sustainability strategy. A range of evidence (Li et al., 2017; Lu & Herremans, 2019; Bravo & Reguera-Alvarado, 2019) argues that a diverse BOD is linked to the decision making that incorporates sustainable agendas because such a board caters for the interest of various stakeholders. Hussain et al. (2018) find that sustainability performance is explained by a more independent board, role separation of CEO and chairperson of the governing board, more female directors, frequency of board meetings and the role of the sustainability committee. In Beji et al. (2020), there is strong evidence that diversity in boards and diversity of boards globally are positively associated with corporate social performance, but they influence differently specific dimensions of CSR performance. For example, large boards are positively associated with all areas of CSR performance, while specific and overall CSR scores are negatively associated with CEO- chair structures.

Our study considers the joint effect of PMC and corporate governance in determining ESG, of which the effect can be viewed from two perspectives. Corporate governance may complement the external pressure arising from PMC, as the board of directors play their role in overseeing the managers due to the higher agency cost arising from greater competition. The complementary role of PMC and corporate governance is evidenced in Januszewski et al. (2002), of which the positive effect of competition on firm value is enhanced by the presence of greater governance. Nevertheless, corporate governance may serve as a substitute for PMC since competition itself serves the role as a takeover, of which managers are forced to do well due to the fear of liquidation. Hence, the benefits of good governance would be expected to be smaller for companies in competitive industries, as compared to companies where a lack of competitive pressure fails to enforce discipline on managers. This perspective is in line with the finding that corporate governance and PMC are substitutive (Chou et al., 2011).

In the context of corporate performance in relation to ESG, corporate governance is required in companies with a high market competition as to monitor the managers that have greater discretionary powers over corporate strategies (Karuna, 2007). Hence, the role of the BOD will strengthen the relationship between the PMC and ESG in the sense that there is an additional pressure for the BOD to leverage on the external uncertainty, pressure, and market trends in facilitating better formulation and delivery of strategic decision-making processes. The role of the BOD is deemed as an important element in strengthening the relationship between PMC and ESG. We posit that firms with greater PMC would experience greater ESG if they are better governed by the BOD. Therefore, the second hypothesis is set as follows:

H2: The positive association between product market competition and ESG is greater for companies with high corporate governance.

RESEARCH DESIGN

Measurement for Variables

We measure ESG using data provided by Thomson Reuters (Refinitiv), previously known as ASSET4, which has been extensively used in prior studies such as Pekovic and Vogt (2020), Ioannou and Serafeim (2012) and Cheng et al. (2014). *ESG_SCORE* ranges from 1 to 100, where 0 indicates the lowest score, and 100 indicates the highest score. In alternative analysis, we employ unweighted

environment and social scores (ES_{UW}) by aggregating the environmental and social scores, and the weighted environment and social scores (ES_W), a weighted index for environmental and social scores calculated using a principal components analysis. We remove the governance score from the calculation of ES_{UW} and ES_W because our tested moderating variable (GOV) is a subset for governance score.

We measure PMC using the Herfindahl-Hirschman index (HHI), consistent with prior studies such as de Almeida and Dalmácio (2015), Dhaliwal et al. (2014), Kamarudin et al. (2020), Gaspar and Massa (2006), and Laksmana and Yang (2015). PMC10 refers to the sum of the squares of the market shares (based on total sales) of all the companies using the Fama and French's ten industries classification for each year and country. For ease of exposition, PMC is derived by multiplying the calculated HHI with a negative one, hence a higher value of PMC reflects more intense industry competition, with each company having a small market share of the industry, and vice versa. In the mathematical form, PMC10 can be represented as in Equation (1):

$$PMC10_i = \sum_{j=1}^j Shares_{ij}^2 * -1 \quad (1)$$

We also employ PMC5, the PMC score calculated based on the HHI on the Fama and French 5 industry classifications, and PMC17, the PMC score calculated based on the HHI on the Fama and French 17 industry classifications. These two additional PMC scores are used in alternative analysis. For corporate governance, we divided our sample into two groups: firms with strong and weak governance. This procedure was undertaken to allow us to evaluate the moderating effect of corporate governance on competition and ESG relationship. We first employ D_{OUTDIR} , which is a dummy variable that takes value 1 if the proportion of non-executive directors to the total number of directors is above the median, otherwise 0. In alternative analysis, corporate governance is proxied by (i) D_{TENURE} , a dummy variable that takes value 1 if the natural logarithm of the average tenure of the board of directors is above the median, otherwise 0, and (ii) D_{BDSIZE} a dummy variable that takes value 1 if the number of directors on board is above the median, otherwise 0.

Regression Models

We regress the Equation (2) to investigate the effect of PMC and corporate governance on ESG. The pooled regression is as presented below:

$$ESG_{it} = \beta_0 + \beta_1 COMPETITION_{it} + \beta_2 GOV_{it} + \beta_3 COMPETITION * GOV_{it} + \beta_k FIRMVARS_{it} + \beta_l COUNTRYVAR_{it} + \theta_{1-n} Fixed Effects + \varepsilon_{it} \quad (2)$$

where *ESG* is the environmental, social and governance score (*ESG_SCORE*) or the alternative measure of either *ES_W* and *ES_UW*; *COMPETITION* is a dummy variable for industry competition, of either *PMC10*, *PMC5* or *PMC17*; *GOV* is a dummy variable for strong corporate governance, of either *D_OUTDIR*, *D_TENURE*, or *D_BDSIZE*.

We also include *FIRMVARS* which are k-vector (k equals to the number of controls), referring to the firm level control variables that are incorporated by prior studies. More specifically, the *FIRMVARS* includes: *SIZE* that is the natural logarithm of total assets; *MTB* that is the ratio of market-to-book value; *ROA* that is the ratio of net income over the total assets; *LOSS* that is a dummy variable equals to 1 if net income is negative, otherwise 0; *LEV* that is the total liabilities over the total assets; *HILIT* that is a dummy variable of high-litigation industries; *QUICK* that is the ratio of current assets minus the inventory divided by the total current liabilities; and *CAPINT* that is the ratio of property, plant and equipment to total assets.

Equation (2) also includes *COUNTRYVAR*, referring to the country level control variable, *GOVDEBT*, which is measured as the ratio of government debts over gross domestic product. The model includes *Fixed_Effects*, which are vectors for industry and year effects. *i* and *t* denote firm *i* at the end of year *t*.

Sample Selection

The data, covering the period 2009–2018, were obtained from various sources mainly from Thomson Reuters database. To mitigate the influence of outliers, we winsorised the observations that fell in the top and bottom 1% of all continuous variables and exclude all countries with less than 30 observations. Our final sample consists of 22,897 firm-year observations from 37 countries. The definition and description for each variable are reported in Table 1.

Table 1
Variable description

Variable	Definition
Corporate sustainability performance variables	
<i>ESG_SCORE</i>	Environmental, social and governance score from Refinitiv-Thomson database ranges from 1 to 100, where 0 indicates the lowest score, and 100 indicates the highest score
<i>ES_UW</i>	An unweighted index for environmental and social scores
<i>ES_W</i>	A weighted index for environmental and social scores calculated using a principal components analysis
Product market competition variables	
<i>PMC10</i>	The Herfindahl-Hirschman index on the Fama and French 10 industry classifications multiplied by negative 1
<i>PMC5</i>	The Herfindahl-Hirschman index on the Fama and French 5 industry classifications multiplied by negative 1
<i>PMC17</i>	The Herfindahl-Hirschman index on the Fama and French 17 industry classifications multiplied by negative 1
Corporate governance variables	
<i>D_OUTDIR</i>	A dummy variable that takes value 1 if the proportion of non-executive directors to the total number of directors is above the median, otherwise 0
<i>D_TENURE</i>	A dummy variable that takes value 1 if the natural logarithm of the average tenure of the board of directors is above the median, otherwise 0
<i>D_BDSIZE</i>	A dummy variable that takes value 1 if the number of directors on board is above the median, otherwise 0
Control variables in the main model	
<i>SIZE</i>	The natural logarithm of the firm's total assets
<i>MTB</i>	The ratio of market-to-book value
<i>ROA</i>	The ratio of net income over the total assets
<i>LOSS</i>	A dummy variable that takes value 1 if net income is negative, otherwise 0
<i>LEV</i>	The total liabilities over the total assets
<i>HILIT</i>	A dummy variable of high-litigation industries, classified as 1 if the SIC codes were between 2833–2836, 3570–3577, 3600–3674, 5200–5961 and 7370–7370, otherwise 0
<i>QUICK</i>	The ratio of current assets minus the inventory divided by the total current liabilities
<i>CAPINT</i>	The ratio of property, plant and equipment to total assets
<i>GOVDEBT</i>	The ratio of government debts over gross domestic product

RESULTS AND DISCUSSION

Descriptive Statistics

The descriptive statistics for firm-level variables, as reported in Panel A Table 2, show that the average *ESG_SCORE* is 39.144 with values ranging from 4.684 and 84.059. For the alternative measures for ESG, *ES_UW* and *ES_W*, the mean values are 36.11 and -0.002 , respectively. The former ranging from 0.364 to 92.04 and the latter ranging from -1.981 to 3.05. The mean value for *D_OUTDIR* is 0.542, with values ranging from 0 to 1, indicating that half of the board is represented by independent directors. For *D_TENURE*, the mean value is 0.501, with values ranging from 0 to 1, indicating that the average board tenure is 50%. For *D_BDSIZE*, the mean value is 0.638, with values ranging from 0 to 1, indicating that the average size of corporate board is 63.8%. For the three proxies of product market competition, Table 2 shows that the mean values are -0.14 for *PMC10*, -0.103 for *PMC5* and -0.152 for *PMC17*.

For the control variables, the mean for *SIZE* is 22.08 with a range between 18.017 and 25.87. The variable *MTB* has a mean value of 3.079 with values ranging from -10.02 and 28.476. *LOSS* has a mean value of 0.143 indicating that 14.3% of the sample constitutes loss firms. Other variables, *ROA* and *LEV*, have mean values of 0.063 and 0.246, respectively. Approximately 20.4% of the sample are in a high litigation-risk industry (*HILIT*). On average, the quick ratio (*QUICK*) of 1.697 indicates that companies have sufficient current assets to cover its current liabilities. The score for *QUICK* ranged between 0.146 to 12.701 while the mean score for *CAPINT* is 0.289. The statistics for the country-level variable, namely the government debts over gross domestic product (*GOVDEBT*), is 95.101.

Panel B of Table 2 presents the descriptive statistics for country-level indexes. The sample is heavily represented by the US ($n = 7,753$) and Japan ($n = 3,194$). Meanwhile, Austria ($n = 35$) and Finland ($n = 31$) have the lowest number of observations.

Table 2
Descriptive statistics

Panel A: Firm Level Descriptive Statistics							
Variable	Mean	SD	p25	Median	p75	Max	Min
<i>ESG_SCORE</i>	39.144	19.598	23.355	37.208	53.583	84.059	4.684
<i>ES_UW</i>	36.11	24.026	15.357	31.856	55.109	92.04	0.364
<i>ES_W</i>	-0.002	1.306	-1.117	-0.231	1.018	3.050	-1.981
<i>D_OUTDIR</i>	0.542	0.498	0.000	1.000	1.000	1.000	0.000
<i>D_TENURE</i>	0.501	0.500	0.000	1.000	1.000	1.000	0.000
<i>D_BDSIZE</i>	0.638	0.480	0.000	1.000	1.000	1.000	0.000
<i>PMC10</i>	-0.140	0.152	-0.163	-0.088	-0.042	-0.012	-0.836
<i>PMC5</i>	-0.103	0.115	-0.131	-0.055	-0.031	-0.014	-0.610
<i>PMC17</i>	-0.152	0.172	-0.191	-0.09	-0.046	-0.019	-0.943
<i>SIZE</i>	22.080	1.580	21.098	22.116	23.098	25.87	18.017
<i>MTB</i>	3.079	4.390	1.112	1.936	3.587	28.476	-10.020
<i>ROA</i>	0.063	0.117	0.025	0.062	0.112	0.397	-0.477
<i>LOSS</i>	0.143	0.350	0.000	0.000	0.000	1.000	0.000
<i>LEV</i>	0.246	0.184	0.102	0.231	0.359	0.817	0.000
<i>HILIT</i>	0.204	0.403	0.000	0.000	0.000	1.000	0.000
<i>QUICK</i>	1.697	1.861	0.789	1.167	1.830	12.701	0.146
<i>CAPINT</i>	0.289	0.238	0.092	0.231	0.439	0.907	0.000
<i>GOVDEBT</i>	95.101	64.527	42.282	90.095	107.351	248.06	4.822

Panel B: Country Level Descriptive Statistics					
Country	N	D_OUTDIR	D_TENURE	D_BDSIZE	GOVTDEBT
Australia	2220	0.651	0.306	0.169	31.048
Austria	35	1.000	0.387	0.829	76.163
Belgium	104	0.740	0.619	0.740	101.037
Canada	917	0.670	0.592	0.588	85.421
China	591	0.245	0.109	0.761	33.598
Denmark	120	0.767	0.417	0.708	44.636
Egypt	39	0.615	0.571	0.615	84.466
Finland	31	0.710	0.065	0.065	55.281
France	388	0.858	0.387	0.964	88.454
Germany	346	0.994	0.364	0.824	74.677
Greece	104	0.365	0.167	0.894	155.615
Hong Kong	687	0.118	0.382	0.795	16.802

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Table 2: (continued)

Panel B: Country Level Descriptive Statistics					
Country	N	D_OUTDIR	D_TENURE	D_BDSIZE	GOVTDEBT
India	536	0.455	0.511	0.808	68.265
Indonesia	231	0.987	0.315	0.182	26.703
Israel	84	0.917	0.482	0.714	71.312
Italy	248	0.665	0.301	0.964	125.143
Japan	3194	0.011	0.322	0.698	234.392
Korea Republic (South)	61	0.148	0.000	0.574	34.377
Malaysia	335	0.537	0.492	0.591	55.278
Netherlands	96	0.885	0.435	0.302	67.381
New Zealand	201	0.826	0.328	0.075	31.682
Norway	42	0.690	0.150	0.476	38.559
Philippines	145	0.303	0.914	0.717	40.729
Poland	157	0.885	0.093	0.401	53.659
Portugal	74	0.338	0.279	0.905	112.390
Russia	245	0.494	0.225	0.927	12.580
Saudi Arabia	51	0.980	0.273	0.784	8.625
Singapore	367	0.662	0.533	0.708	103.961
South Africa	730	0.381	0.472	0.849	44.237
Sweden	201	0.761	0.560	0.672	42.190
Switzerland	187	0.829	0.497	0.417	47.376
Taiwan	892	0.344	0.719	0.584	39.060
Thailand	184	0.397	0.608	0.978	44.109
Turkey	164	0.591	0.172	0.811	36.600
United Arab Emirates	37	0.541	0.136	0.541	19.316
United Kingdom	1100	0.215	0.234	0.541	82.396
United States of America	7753	0.774	0.692	0.696	100.763
Total	22897				

A pairwise correlation matrix of the variables is presented in Table 3. The highest correlation is between alternative proxies of ESG variables, as correlation between *ES_UW* and *ES_W* is counted at 0.999. The result further shows that *ESG_SCORE* is correlated with *ES_UW* and *ES_W* at the count of 0.913 and 0.915, respectively. The correlation between product market competition measures, between *PMCI0* and *PMCI5* and *PMCI0* and *PMCI7* are at 0.770 and 0.698, respectively. The correlation coefficients of the rest of the variables are considered modest ranging from the highest of 0.511 to the lowest of -0.234, thus giving less cause for concern about the multicollinearity problem.

Table 3
Pairwise correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) <i>ESG_SCORE</i>	1								
(2) <i>ES_UW</i>	0.913*	1							
(3) <i>ES_W</i>	0.915*	0.999*	1						
(4) <i>PMCI0</i>	-0.102*	-0.132*	-0.132*	1					
(5) <i>PMCI5</i>	-0.096*	-0.113*	-0.115*	0.770*	1				
(6) <i>PMCI7</i>	-0.112*	-0.150*	-0.149*	0.698*	0.579*	1			
(7) <i>D_OUTDIR</i>	0.147*	0.118*	0.127*	-0.084*	-0.053*	-0.077*	1		
(8) <i>D_TENURE</i>	-0.011	-0.038*	-0.035*	0.138*	0.148*	0.120*	0.086	1	
(9) <i>D_BDSIZE</i>	0.266*	0.291*	0.288*	-0.027*	0.050*	-0.001	0.108*	0.065*	1
(10) <i>SIZE</i>	0.449*	0.511*	0.504*	-0.080*	0.027*	-0.055*	0.046*	-0.014	0.446*
(11) <i>MTB</i>	-0.003	-0.012	-0.006	0.029*	0.007	0.061*	0.077*	0.054*	-0.024*
(12) <i>ROA</i>	0.111*	0.085*	0.085*	-0.007	-0.006	0.005	0.014	0.134*	0.075*
(13) <i>LOSS</i>	-0.151*	-0.126*	-0.124*	0	-0.011	-0.009	0.008	-0.100*	-0.136*
(14) <i>LEV</i>	0.056*	0.063*	0.063*	-0.038*	0.015	0.030*	0.084*	-0.039*	0.148*
(15) <i>HILIT</i>	0.020*	0.017*	0.022*	0.123*	0.056*	0.066*	-0.020*	0.096*	-0.037*
(16) <i>QUICK</i>	-0.193*	-0.188*	-0.185*	0.089*	0.042*	0.051*	-0.035*	-0.003	-0.192*
(17) <i>CAPINT</i>	-0.020*	0.020*	0.014	-0.066*	0.008	-0.076*	0.003	-0.077*	0.012
(18) <i>GOVDEBT</i>	0.088*	0.105*	0.097*	0.257*	0.263*	0.251*	-0.292*	-0.041*	0.117*
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(10) <i>SIZE</i>	1								
(11) <i>MTB</i>	-0.168	1							
(12) <i>ROA</i>	0.083*	0.182*	1						
(13) <i>LOSS</i>	-0.234	-0.01	-0.652*	1					
(14) <i>LEV</i>	0.280*	-0.055*	-0.146*	0.038*	1				
(15) <i>HILIT</i>	-0.094*	0.120*	0.046*	0.017	-0.140*	1			

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Table 3: (continued)

(16) <i>QUICK</i>	-0.334*	0.051*	-0.130*	0.203*	-0.322*	0.065*	1		
(17) <i>CAPINT</i>	0.085*	-0.116*	-0.072*	0.090*	0.132*	-0.170*	-0.133*	1	
(18) <i>GOVDEBT</i>	0.207*	-0.072*	-0.022*	-0.065*	-0.012	0.049*	0.006	-0.055*	1

Note: * shows significance at the 0.01 level

In general, all variables for ESG are negatively correlated with variables for PMC. All variables for ESG are positively correlated with *D_OUTDIR* and *D_BDSIZE*, and negatively correlated with *D_TENURE*. Variables for PMC are negatively correlated with *D_OUTDIR*, and positively correlated with *D_TENURE*. Mixed evidence is shown for the correlation between variables for PMC and *D_BDSIZE*. *ESG_SCORE* is found to be positively correlated with *SIZE*, suggesting that larger companies are highly engaged in ESG, consistent with Lys and Soo (1995), Lang and Lundholm (1996) and Jiao et al. (2012). *ESG_SCORE* is also positively linked to the following: *ROA*, *LEV*, *HILIT* and *GOVDEBT*. We find *MTB*, *LOSS*, *QUICK* and *CAPINT* are negatively correlated with *ESG_SCORE*.

Main Results

We first examine the link between product market competition (*PMCI0*) and *ESG_SCORE*. The results for the sample with high and low corporate governance are reported in Column (1) and Column (2) of Table 4, respectively. As predicted in the hypothesis, the coefficient on *PMCI0* is significant indicating that *PMCI0* is associated with *ESG_SCORE*. The coefficient is negative, suggesting that product market competition is negatively associated with the corporate performance on environmental, social and governance. For both the strong and weak corporate governance samples, the coefficients for *PMCI0* are statistically significant at the same direction, which is negative. Hence, regardless of the variations in the strength of corporate governance, the results in Column (1) and Column (2) indicate that higher product market competition is associated with lower ESG performance.

In Column (3), using the pooled sample, we examine the effect of product market competition and corporate governance on ESG. The results show that the coefficient for *PMCI0* is significantly negative, suggesting that companies with higher PMC are linked to lower ESG. The coefficient on the variable *D_OUTDIR* is positive and significant ($p < 0.01$) suggesting that the level of ESG is greater within better governed companies. For the second hypothesis, we test the joint effect of product market competition and corporate governance

by including the interaction term $PMC10*D_OUTDIR$. As presented in Column (4), the result of the coefficient for $PMC10*OUTDIR$ is positive and significant ($p < 0.01$), consistent with the prediction that better governance alleviates the negative impact of $PMC10$ on ESG_SCORE . The result implies that strong corporate governance encourages companies to engage more on ESG to balance the impact of the competitive environment. In other words, intense product market competition significantly decreases companies' ESG performance only in the absence of effective corporate governance mechanisms to uphold ESG for supporting the fundamental business objectives of the corporation.

The finding indicates that PMC and corporate governance affect ESG differently, as higher PMC is shown to be leading to lower ESG, while higher corporate governance results in higher ESG. Nevertheless, the joint effect of PMC and corporate governance positively affect ESG in a way that for companies in high product market competition sample, those with better corporate governance are shown to have higher ESG than other companies in the same sample. Hence, corporate governance moderates the association between PMC and ESG.

Table 4
Regression estimates for corporate governance, product market competition and ESG

	(1) Weak governance	(2) Strong Governance	(3) Pooled	(4) Pooled
Intercept	-86.658*** (-27.772)	-97.312*** (-36.279)	-95.070*** (-46.990)	-95.888*** (-47.203)
PMC10	-21.622*** (-15.537)	-11.452*** (-11.286)	-15.484*** (-19.094)	-19.558*** (-15.656)
D_OUTDIR			5.132*** (21.988)	6.060*** (19.037)
PMC10*D_OUTDIR				6.436*** (4.286)
SIZE	5.567*** (42.101)	6.500*** (58.367)	6.042*** (71.406)	6.049*** (71.505)
MTB	0.192*** (4.178)	0.185*** (5.761)	0.175*** (6.595)	0.173*** (6.537)
ROA	6.557*** (3.284)	9.867*** (5.750)	7.986*** (6.104)	7.887*** (6.030)
LOSS	-0.192 (-0.294)	-0.310 (-0.546)	-0.274 (-0.635)	-0.318 (-0.737)
LEV	-7.759*** (-7.112)	-5.497*** (-5.998)	-7.103*** (-10.173)	-7.220*** (-10.337)

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Table 4: (continued)

	(1) Weak governance	(2) Strong Governance	(3) Pooled	(4) Pooled
HILIT	-0.959*** (-9.873)	-0.742*** (-7.749)	-0.851*** (-12.465)	-0.847*** (-12.413)
QUICK	-2.763*** (-2.872)	-2.569*** (-3.076)	-2.264*** (-3.606)	-2.150*** (-3.422)
CAPINT	0.025*** (10.918)	-0.022*** (-4.395)	0.015*** (7.387)	0.016*** (7.879)
GOVDEBT	5.567*** (42.101)	6.500*** (58.367)	6.042*** (71.406)	6.049*** (71.505)
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
Adjusted R^2	0.29	0.33	0.31	0.31
N	10485	12412	22897	22897
F-statistic	51.071	70.381	118.091	117.059

Note: t -statistic in parentheses (* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$)

For the control variables, the results in Table 4 reports that *SIZE*, *MTB*, *ROA*, *CAPINT* and *GOVDEBT* have positive relationships with *ESG_SCORE*, while *LEV*, *HILIT* and *QUICK* are found to have negative association with the *ESG_SCORE*. Taken together, these results support the notion that corporate governance affects the relationship between PMC and corporate engagement in ESG. The results exhibit that intense competition faced by companies discourage them from engaging in ESG, hence suggesting a strong negative effect of *PMCI0* on *ESG_SCORE*. In other words, higher industry competition leads to lower ESG engagement but the monitoring role of the corporate board, as performed through corporate governance, diminishes the impact of PMC by encouraging companies on adopting active strategies for ESG.

Robustness Tests

We perform several tests to ensure the robustness of the main findings reported in Table 4. More specifically, we employ several alternative variables to test whether our results are limited to specific choice of variables. First, we re-estimate Equation (2) using the unweighted environment and social score (*ES_UW*) and the weighted environment and social score variable (*ES_W*) as the dependent variables, where the estimation results are reported in Column (1) and Column (2), respectively. The coefficients for *PMCI0* are negatively significant in both columns, showing robust evidence as reported in the primary analyses.

For D_OUTDIR and $PMC10*D_OUTDIR$, we find the coefficients are positively significant exhibiting evidence that corporate governance has positive impact on ESG and reduces the negative impact of competition on ESG.

Second, we replace D_OUTDIR with D_TENURE , referring to the average tenure of the board of directors, and D_BDSIZE , referring to the number of directors on board. D_TENURE and D_BDSIZE are alternative proxies for corporate governance in this study. The results in Column (3) and Column (4) of Table 5 show that the coefficients of $PMC10$ negatively significant, while the coefficients for D_TENURE and D_BDSIZE are significant and positive. These results are like those in Table 4, when corporate governance is proxied by D_OUTDIR . For the joint effect of PMC and corporate governance, the interaction terms of $PMC10*D_TENURE$ and $PMC10*D_BDSIZE$ are shown to have a significantly positive coefficient, implying that corporate governance moderates the association between PMC and ESG, thus provides validation for our main analysis.

Third, we replace $PMC10$ with $PMC5$ and $PMC17$. The two alternative variables for product market competition is derived based on HHI using 5 industries and 17 industries of Fama and French classification. The results presented in Column (5) and Column (6) in Table 5 show consistent findings as compared to Table 4. More specifically, the coefficients for $PMC5$ and $PMC17$ are significant and negative, while the coefficients for D_OUTDIR are positive and significant. For the interaction variables, the coefficients of $PMC5*D_OUTDIR$ and $PMC17*D_OUTDIR$ are significantly positive. This implies that the negative association between PMC and ESG is moderated by corporate governance.

Fourth, we also tested whether our results are sensitive to the inclusion of countries with extremely large number of observations. We perform two procedures: first, we exclude firms from the U.S. ($n = 7753$), Japan ($n = 3194$) and Australia ($n = 2220$) which constitute more than 50% the total sample, and second, we estimate the Weighted Least Square (WLS) regression where the results are reported in Column (7) and Column (8), respectively. Both analyses yield similar findings, showing robust evidence on the negative impact of industry competition on ESG, and also find evidence on the positive influence of strong corporate governance in alleviating the negative relationship between industry competition and ESG.

Table 5
Robustness analyses

	(1) ESG = ES_UW	(2) ESG = ES_W	(3) GOV = D_TENURE	(4) GOV = D_BDSIZE	(5) COMPETITION = PMCS	(6) COMPETITION = PMC17	(7) Exclude US, JPN, AUS	(8) WLS regression
Intercept	-153.512*** (-64.996)	-10.308*** (-79.940)	-100.247*** (-47.682)	-89.495*** (-41.976)	-99.141*** (-48.826)	-95.812*** (-47.058)	-94.088*** (-33.846)	-94.011*** (-48.615)
PMC10	-28.099*** (-19.345)	-1.540*** (-19.421)	-20.338*** (-18.225)	-17.790*** (-13.151)			-14.917*** (-9.906)	-21.522*** (-16.365)
PMC5					-33.623*** (-20.466)			
PMC17						-15.847*** (-14.162)		
D_OUTDIR	5.880*** (15.886)	0.339*** (16.778)			6.777*** (21.518)	5.648*** (17.946)	8.635*** (17.512)	5.958*** (18.776)
D_TENURE			0.715*** (2.256)					
D_BDSIZE				3.519*** (10.611)				
PMC10*D_OUTDIR	6.151*** (3.523)	0.359*** (3.764)					11.546*** (6.318)	6.334*** (3.991)
PMC10*D_TENURE			11.251*** (6.894)					
PMC10*D_BDSIZE				3.605*** (2.306)				
PMC5*D_OUTDIR					14.343*** (7.239)			
PMC17*D_OUTDIR						3.786*** (2.829)		

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Table 5: (continued)

	(1) ESG = ES_UW	(2) ESG = ES_W	(3) GOV = D_TENURE	(4) GOV = D_BDSIZE	(5) COMPETITION = PMC5	(6) COMPETITION = PMC17	(7) Exclude US, JPN, AUS	(8) WLS regression
SIZE	8.566*** (87.090)	0.465*** (86.510)	6.477*** (74.302)	5.872*** (64.496)	6.102*** (72.514)	6.024*** (71.097)	5.705*** (48.598)	6.121*** (72.969)
MTB	0.302*** (9.801)	0.017*** (10.072)	0.207*** (7.655)	0.194*** (7.276)	0.179*** (6.800)	0.181*** (6.813)	0.328*** (7.417)	0.161*** (6.191)
ROA	7.728*** (5.082)	0.432*** (5.202)	7.276*** (5.371)	7.566*** (5.739)	7.768*** (5.968)	8.165*** (6.239)	8.044*** (4.233)	7.704*** (5.979)
LOSS	(-10.959) 2.027***	(-10.697) 0.126***	(-9.190) 0.483	(-9.378) 0.892**	(-9.890) 0.544	(-9.822) 1.150**	(-6.895) 2.785***	(-10.535) 0.756*
LEV	(3.867) -0.691***	(4.407) -0.036***	(1.041) -0.875***	(1.962) -0.821***	(1.212) -0.800***	(2.545) -0.884***	(3.848) -0.654***	(1.706) -0.819***
HILIT	(-1.748) 0.022***	(-1.866) 0.001***	(-3.562) -0.006***	(-4.010) 0.001	(-3.628) 0.019***	(-3.444) 0.016***	(0.521) 0.072***	(-3.086) 0.015***
QUICK	(9.305) 8.566***	(8.264) 0.465***	(-3.263) 6.477***	(0.697) 5.872***	(9.523) 6.102***	(7.982) 6.024***	(13.039) 5.705***	(7.405) 6.121***
CAPINT	(87.090) 0.302***	(86.510) 0.017***	(74.302) 0.207***	(64.496) 0.194***	(72.514) 0.179***	(71.097) 0.181***	(48.598) 0.328***	(72.969) 0.161***
GOVDEBT	(9.801) 7.728***	(10.072) 0.432***	(7.655) 7.276***	(7.276) 7.566***	(6.800) 7.768***	(6.813) 8.165***	(7.417) 8.044***	(6.191) 7.704***
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.38	0.38	0.31	0.30	0.32	0.31	0.32	0.32
N	22897	22897	20961	22897	22897	22897	11950	22897
F-statistic	158.784	155.488	109.675	111.340	120.845	116.868	64.306	133.896

Note: t-statistic in parentheses (* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$)

CONCLUSIONS

Our study provides empirical evidence on how external governance (PMC) and internal governance (corporate governance) jointly influence the corporate performance on ESG. We document that PMC decreases ESG, and we further find that corporate governance moderates the relation between PMC and ESG. More specifically, higher corporate governance weakens the negative effect of PMC on ESG. Our findings indicate that better governed firms can affectively alleviate the negative impact of PMC on corporate ESG performance.

Our study provides empirical evidence that product market competition plays an important governance role in determining the ESG efforts. It provides useful insights to investors and policymakers that excessive external pressures from the competition might give a negative effect on the ESG practices. In addition, we offer empirical evidence on the role of strong internal governance establishment, through high-quality corporate governance, in encouraging companies to improve their ESG performance. Given that highly intense competitiveness can enforce organisational resistance to ESG, the effort for fostering substantive ESG adoption by companies depends on the effectiveness of internal governance. This yield an important insight for policy formulations that internally imposed governance act as a vital measure to force management to be disciplined and selectively cautious on reducing the overuse of resources by focusing only on ESG activities that have major contribution to enhance fundamental business objectives, hence to help companies to attain competitive advantages. In this context, intense product market competition can potentially become a source to encourage the corporate board to strategically evaluate the ESG to ultimately contribute towards capturing the most of corporate growth potential. Higher competition is a valuable source to provoke for internal governance improvement, both of which broadly provide the sources of superior ESG performance than less competitive companies.

To make further progress, future research is recommended to consider the following approach. First, analysis on the PMC, corporate governance and ESG can be taken at the economic regional that shares some similar institutional contexts but still diverse in many other aspects, such as ASEAN. This would allow the analysis to explore the concerted efforts made on ESG at the regional level and assess their effectiveness in encouraging more companies to commit to better ESG. Second, future research that employ international dataset can incorporate other institutional variables including those of formal structure such as government policies towards ESG or informal structure such as culture that has the tendency to influence ESG practices among companies. Specific country-level variable that may influence on ESG, such as country-level corporate governance score, can be

explored as the determinants of ESG. Finally, attempting on exploring the banking industry would be a promotable research agenda. This is because banking industry is among the key player in ESG initiative due to the expected role in relation to investment product that they could offer for sustainable investing. Sustainable, responsible and impact (SRI) investing is a term employed in the finance sector referring to the application of ESG factors to screen on the investment universe.

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NOTE

1. According to Bassen and Kovacs (2008), there is no specific definition of ESG and the concept of ESG has been used in different contexts. Rezaee (2016) and Jain et al. (2016) found that researchers had used several terms to represent ESG. The terms corporate social responsibility (CSR), economic, governance, social, ethical, and environmental (EGSEE) and sustainability has been used interchangeably.

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