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Corporate Sustainable Practices and Profitability – Compatible?

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Abstract

Carbon risks and corporate social responsibility have emerged as top priorities in the global climate change agenda, leading shareholders to exert greater pressure on corporations to adopt environmental, social and governance (ESG) practices and policymakers to consider regulatory actions on carbon disclosures. Proponents stress that ESG strategies will improve financial performance, while detractors focus on their large upfront costs. The literature is inconclusive in part because it has focused predominantly on the environmental pillar alone, or ESG as a combined strategy without clearly delineating how social and governance strategies also affect corporate profitability. Distinguishing between the three pillars of ESG, this paper finds that each of these strategies individually as well as jointly are positively associated with corporate profitability. The findings are robust to firm-level controls for size and access to capital markets, as well as macroeconomic variables, and unobserved country and year fixed effects that may reflect differences in tax jurisdictions and disclosure stringency.

Keywords: corporate social responsibility, climate change, ESG, financial performance, return on assets

1. Introduction

With the United States re-joining the Paris Agreement in 2021, carbon risks and corporate social responsibility (CSR) resurfaced as top priorities in the global climate change agenda. Strong commitments by government officials at the November 2021 United Nations climate change conference—the Conference of the Parties (COP26)—reaffirmed the pledge to reduce methane gas emissions, deforestation, the financing of coal projects, and to strengthen the regulatory framework on carbon trading (UNFCCC, 2021). These events were watched closely by the corporate and financial community who collectively represent the group for whom environmental (E), social (S) and governance (G) regulations are expected to have far-reaching implications on balance sheets and financial performance.

Despite the resurgent interest in ESG, the issue of whether corporates' sustainable actions are in practice linked to financial performance remains one of the most important—and unanswered—research questions. Proponents of stronger ESG corporate strategies emphasize that investment in sustainable practices is indispensable to long-run financial success, pointing to both the direct costs of climate change, such as cascading costs from stranded assets and infrastructure vulnerabilities from exposure to catastrophic rise in temperatures, as well as indirect costs from deforestation, water insecurity and curtailed shipping routes that can hit supply chains and market functioning (Nordhaus 2015, IPCC 2018, Gillingham and Stock 2018, Krueger, Sautner and Starks 2020, Bolton and Kacperczyk 2021, Hong, Wang and Yang 2021, Ilhan et al. 2021, Carbon Disclosure Project, 2021). Loss of access to capital markets and shrinking consumer bases from changes to consumer preferences have also been noted as risks to financial performance that could result from weak ESG strategies (OECD, 2021).

The other side of the debate cautions that even if corporate sustainable practices can deliver the desired improvements in ESG, there is no mistaking that investments in these practices will entail large upfront costs that reduce corporate profitability both immediately and in the foreseeable future. Indeed, recent research by the European Corporate Governance Institute has documented that institutional investors who engaged in responsible investment by adopting ESG practices had lower financial returns and higher risk than others (Gibson, Glossner, Krueger, Matos and Steffen 2020); other research has gone further to suggest that corporates with weak performance may take refuge in making ESG announcements to conceal lackluster financial performance (Amel-Zadeh and Serafeim 2018, Gibson, Krueger and Mitali 2020; Flugum and Souther, 2022). These arguments are predicated on the idea that if ESG was indeed profit-enhancing, then corporates, acting in their own self-interest, would embrace ESG practices without being prodded (Das 2022). That is, if the risks from floods, hurricanes, and storms, and proven commitment to social causes and governance are reflected in the valuation of financial

instruments, then in the pursuit of financial success, businesses would act to incorporate ESG considerations into business decisions.

1.1 Findings of the Literature

These issues have become of singular interest to stockholders who have exerted significant pressure on corporations to comprehensively adopt ESG strategies, and to policymakers who are considering regulatory actions to enforce carbon disclosures. However, a clear picture of the impact of ESG strategies on financial performance has remained elusive. This reflects three broad shortcomings of the existing literature. One, studies have focused predominantly on the so-called "environmental pillar" of ESG, limiting what can be learned about the broader corporate responsibility agenda on corporate financial performance (e.g., Cornell and Damodaran 2020, Matos 2020, Seltzer, Stark and Zhu 2020, Krueger, Sautner and Starks 2020). Second, many other papers have focused on "ESG" as a composite measure, as though a strong environmental strategy combined with a weak social and governance strategy is no different from a balanced E, S and G strategy (e.g., Amel-Zadeh and Serafeim 2018, Gibson, Glossner, Krueger, Matos and Steffein 2020, Gibson, Krueger and Mitali 2021). (Note 1) Third, the findings of this literature are inconclusive due to the range of results that make it difficult to draw clear conclusions. In particular, empirical research has found that the adoption of ESG strategies can have positive, negative, or ambiguous impact on financial performance (Atz, Holt, Liu and Bruno 2022).

Differences in research methodology, differences in sample composition and the measurement of variables also limit drawing general conclusions. Measures of performance are highly varied, and have included Tobin's Q, earnings per share (EPS), profit margins, market capitalization, share price, sales, stock returns, return on assets (ROA), return on equity (ROE), measures of earnings (EBI, EBT, EBIT), among others. More significantly, they rely on voluntary disclosures drawn from the Carbon Disclosure Project, which is subject to understating emissions or "greenwashing" (Lyon and Montgomery 2015, Yang et al. 2020, Yu et al. 2020). Meta analyses assert a positive correlation between corporate sustainability practices and financial performance, but only reflect that a numerical count of papers which find in favor of this relation outnumber the papers that do not (Atz et al. 2022).

This paper makes three contributions. First, in a departure from the standard approach, it distinguishes between "E", "S" and "G" to clearly delineate which specific pillars of corporate responsibility are associated with better financial performance. Financial performance is precisely defined as the ROA which is a forward-looking measure that encapsulates the profitability of a corporation in relation to its total assets. Second, it analyzes data at the firm level. In doing so, it is able to control for significant within-industry disparities in capitalization, emissions, and outlays on ESG that more aggregate analysis (typically conducted at sector level) are not able to avoid. Finally, the analysis controls for key firm-level variables such as total assets under management, the debt-to-asset ratio and country-level fixed effects which absorb differences arising from geography, along with country-level macroeconomic variables.

In a sample of 184 firms in 37 countries observed at annual frequency between 2013 and 2020, the core findings of this paper are that *each* of the three ESG pillars is positively associated with corporate financial performance. The result is robust to a battery of controls, including firm-level controls and business cycle conditions, as well as country and year fixed effects. While the result is consistent with meta analyses that demonstrate a positive association between corporate responsibility and financial performance, it clarifies very transparently the underlying sources of this relation. Furthermore, the magnitudes of the associations between returns on assets and the three pillars of E, S and G demonstrate that the payoff from investing in social and environmental strategies are consistently larger than investment in governance. The paper provides some plausible rationale for this result including that it may simply reflect that corporations have previously invested significantly in improving corporate governance, thus reducing its marginal impact, while investment in social and environmental pillars is at relatively lower levels.

The remainder of the paper is organized as follows. In Section II, the data used in the paper are discussed, stylized facts about each individual pillar of the ESG metrics and the regression models that are estimated. Section III discusses the results of estimating these models. Section IV concludes.

2. Data and Empirical Model

The data used in this analysis are from three sources: Thomson Reuters Eikon (Refinitiv), International Financial Statistics (IFS) and the International Monetary Fund's World Economic Outlook (WEO). The key independent variables—the three so-called "pillars" of ESG—are drawn from Refinitiv; this is also the source for the firm-level data, including the dependent variable (the return on assets). Thomson Reuters provides an overall measure of ESG as well as measures of each individual pillar: environment (E), social (S) and governance (G). Each score ranges from 1 (the lowest) to 100 (highest), and the scores are ordinal with no other intrinsic value. (Note 2) The

scores are weighted averages of sub-components within each pillar. (Note 3) Scores are updated on an annual basis and available for some 12,000 public and private corporations, with a time series going back to 2002. This study focuses on the time period 2013-20 to reflects the upsurge in ESG concerns since 2013 (Sovereign Wealth Fund Institute, 2020).

Returns on assets are calculated as net income (that is, income less taxes) in ratio to total assets. Other firm-level variables include debt-to-asset (as a measure of leverage) and total assets under management (as a proxy for size). Country fixed effects are added to control for jurisdictional differences in ESG regulatory stringency and exposure to ESG-specific laws and regulations. Macroeconomic variables in the analysis control for business cycle effects on returns; these include annual (CPI) inflation rates and real GDP growth rates. The data are winsorized at 1 and 99 percent to eliminate outliers, and firm-year observations in countries without a full set of observations on the ESG metrics are dropped. The sample is an unbalanced panel that covers 184 firms, headquartered in 37 countries, and observed between 2013 and 2020. Summary statistics all variables used in the regression analysis are presented in Table 1, including those representing corporate social responsibility (summarized in E, S and G) that are the focus of this study, as well as firm and macro-level variables. A first noticeable feature of the ESG scores is that the average governance score exceeds the average environmental score which in turn exceeds the average social score; moreover, since the dispersion of governance scores is the lowest, it is suggestive that not only do corporations expend greater effort in their governance strategies (pulling up the governance score), but that they are also more similar to each other in this dimension than in environmental or social strategies (resulting in lower dispersion for governance). For reference, Table 1 also reports the overall ESG score which reflects "*the company's ESG performance, commitment and effectiveness*" (Thomson Reuters Eikon 2022). In the country-year sample used in this study, the Overall Score is lower than all the individual ESG scores except the governance score.

Table 1. Summary Statistics

Variable	No. Obs.	Mean	Std. Dev.	Min	Max
Environmental Pillar (E)	607	0.51	0.24	0.15	0.99
Social Pillar (S)	652	0.47	0.23	0.11	0.98
Governance Pillar (G)	643	0.53	0.22	0.50	0.99
ESG Overall Score, (ESG)	641	0.49	0.25	0.35	0.97
Total assets	832	23.8	2.2	9.4	28.3
Debt to assets	823	0.29	0.25	0[#]	10.3
Year-on-year CPI inflation	805	0.03	0.02	-0.001	8.6
Real GDP growth rate	805	0.052	0.023	-0.025	0.091
Return on assets (R)	841	0.094	0.092	-0.76	0.859

Notes. The reported E, S, G and Overall ESG scores in this table scale the original score as reported in Refinitiv by 100 so that instead of a range of [1,100], their range is [0.01, 1]. Total assets are in natural logs. Note that "0" entries reflect values that are smaller than 1e-05 and are reported as zero for brevity. Debt to assets, inflation, growth rate and returns on assets are in percent so that 0.X is X%. All variables are winsorized at 1% and 99%.

Sources. Thomson Reuters Eikon (Refinitiv), International Financial Statistics, World Economic Outlook and author's calculations.

Table 2. Correlation of the E, S and G Pillars

	E	S	G
E	1		
S	0.859	1	
	(0.000)		
G	0.580	0.607	1
	(0.000)	(0.000)	
Overall ESG	0.913	0.881	0.762
	(0.000)	(0.000)	(0.000)

Notes. P-values are shown in parenthesis below the correlation coefficient.

Sources. Thomson Reuters Eikon and author's calculations

Table 2 presents the correlation matrix of the three pillars of ESG as well as their bivariate correlation with the overall ESG score. The correlations of each pillar of ESG is strongly positive with all other pillars, as well as the overall score. This underscores that even though corporates may expend a differential level of investment on E, S and G, they strategize on all three pillars. That is, E, S and G are complementary strategies rather than substitutes.

2.1 Estimated Regressions

The paper next tests whether, taking account of firm-level characteristics, country characteristics, and year and country (unobserved) fixed effects, measures of ESG are *individually* empirically correlated with firm performance. In order to do so, the analysis begin with the following panel regression model:

$$R_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 G_{it} + \beta_4{}' F_{it} + \beta_5{}' M_{it}\alpha_i + \tau_t + \varepsilon_{it} \quad (1)$$

where *i* indexes firm, *t* denotes year, *R* is the return on assets, *E, S* and *G* respectively denote the scores for the environment, social and governance measures, *X* is a vector of firm-level variables and *M* is a vector of macroeconomic controls as summarized in Table 1; α_i is a country-specific fixed-effect, τ_t is a year fixed-effect and ε_{it} denotes an idiosyncratic error term.

The following variants of equation (1) are estimated:

(a) The baseline results are obtained from estimating (1) sequentially: including only *E*; including only *S*; including only *G*. That is, this sets $\beta_4 = 0$ and $\beta_5 = 0$ in all the regressions, and additionally, it sequentially sets $\beta_1 = 0$, $\beta_2 = 0$ and $\beta_3 = 0$ one by one. These results are reported in Table 3.

(b) The paper then re-estimates a version of (1), in which firm-level controls are adding, but $\beta_5 = 0$, with results reported in Table 4. Thus, the model estimated is:

$$R_{it} = \beta_0 + \beta_1 E_{it} + \beta_2 S_{it} + \beta_3 G_{it} + \beta_4{}' F_{it} + \tau_t + \varepsilon_{it} \quad (2)$$

(c) Finally, equation (1) is re-estimated using all variables from Table 2, sequentially controlling for E, S and G, and including all firm-level controls and macroeconomic variables. The results are reported in Table 5.

In estimating each regression, clustered standard errors (SEs) are reported based on the argument by Bertrand, Duflo and Mullainathan (2004) that observations in a cluster are likely to experience the same shocks. Unlike robust SEs, which can only account for heteroskedastic error terms, clustered SEs account for both heteroskedastic and correlated errors within clusters. Clustering can arise for a number of reasons, including if errors are serially correlated *within* a firm (Cameron and Miller 2015). This is particularly likely in a panel data sample, due to the time-series per country that is used in estimation.

Empirical Results

Results from estimating the first variant of equation (1) are presented in Table 3. Using both country and year fixed-effects, and reporting Huber-consistent standard errors clustered at the country level, the association of each ESG pillar with return on assets separately is reported in columns (1)-(3), and the overall ESG score in column (4).

Table 3. The relation of returns on assets with E, S and G Scores (2013-20)

Dependent variable: Return on assets (income minus taxes in ratio of total assets), percent

	(1)	(2)	(3)	(4)
E	.0616***			
	(.009)			
S		.0760***		
		(.0193)		
G			.0314***	
			(.0133)	
Overall ESG				.0733***
				(.0334)
Constant	.056***	.049***	.057***	.044***
	(.007)	(.007)	(.009)	(.008)

Observations	607	652	643	641
Adjusted r-sq	0.21	0.18	0.17	0.19
Country fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y

Notes. Table 3 reports results of estimating equation (1). Huber-consistent (robust) standard errors are reported in parenthesis, and clustered by country. Notation on significance is given by: *** p<0.01, ** p<0.05, * p<0.1 where p denotes p-value.

The results show that every pillar of ESG has a positive association with returns, each significant at the 1 percent error level. The coefficients indicates that a corporation that increases its E, S and G scores from 0 to 0.1(Note 4) can on average observe an improvement of 0.67, 0.76, and 0.31 percent. This suggests that, irrespective of which strategy corporates pursue—environmental, social or governance—these strategies are associated with improved profitability. As all ESG pillars are positively associated with returns, the Overall ESG score (a weighted average of the individual pillars) is unsurprisingly also positively associated with returns. The regressions are well-fitted, with adjusted R-squared ranging from 0.18 to 0.21 that are generally considered large in a panel regression (Hsiao 1996).

In terms of magnitudes, the results indicate that social and environmental strategies have the largest impact, each more than double that of governance strategies. A t-test between the pairs indicates that there is no statistical difference between the coefficient estimates of S and E (p=0.43), but that the estimates on both S and E are statistically different from that on G (respectively p=0.002 and p=0.01). That is, even though all ESG strategies can improve returns on assets, a unit improvement in social and environmental scores tends to pay off more for corporates. This finding appears to be new to my paper.

3.1 Firm-Level Controls

Next, Table 4 turns to ask how the results of Table 3 hold up when key controls for firm level variables are included. This is essentially a test of robustness that considers whether the beneficial returns-effect of ESG outlays are simply absorbing the size of the firm (proxied in this study by total assets under management). The theoretical relation between firm size and profitability is however a priori ambiguous. On the one hand, some argue that larger firms can exploit economies of scale and scope and borrow on preferential terms, leading to a lower probability of bankruptcy and thus greater profitability (Amato and Wilder 1985, Voulgaris and Lemonakis, 2014, Rajan and Zingales 1995, Delcoure 2007, Prasetyantoko and Parmono, 2009). On the other hand, larger corporations are sometimes encumbered with inefficiencies arising from bureaucratic processes and agency problems (Jensen and Meckling 1976, Fama and Jensen 1983, Delcoure 2007, Hart and Zingales 2017). It is therefore an empirical question how controls for firm size (proxied by the natural log of assets) is associated with returns on assets, and whether controls for firm size affects the estimated coefficients on the ESG pillars.

A corporation's debt-to-asset ratio may also play a role in determining the returns to assets, although the null hypothesis is once again priori unclear. On the one hand, the larger is this ratio the greater could be corporate access to capital markets which also permits greater funds for ESG outlays (Hull and Rothenberg 2008); on the other hand, smaller firms with low cash flow and limited access to private equity may be forced to take on greater leverage for working capital, leaving limited resources to invest in ESG. The sign of the relation between debt to assets and returns, therefore, is also an empirical matter.

The results in Table 4 show that the impact of ESG strategies on returns are not merely reflecting firm size or their borrowing capacity (proxied by the debt to asset ratio). The coefficient estimates of E, S, G as well as the Overall ESG continue to exhibit significance at the 1 percent error level. Indeed, the estimates are not much altered from Table 4 with the inclusion of firm-level controls, pointing to their limited covariance with firm characteristics. Although the estimated coefficient of the environmental pillar is now numerically larger than the social pillar, a t-test reveals that they are not statistically distinguishable (p-value= 0.346). Two additional results bear emphasis: first, the coefficient on total assets (the proxy for firm size) is consistently negatively associated with the returns to assets. That is, the results favor the rich theories that point to scale inefficiencies and agency problems of large firms, which bear negatively on profits. Second, the estimated coefficients on debt to assets is not statistically significant in any regression. A plausible explanation is high multicollinearity between debt-to-assets and total assets since the former is scaled by total assets. (Note 5)

Table 4. The relation of returns on assets with E, S, G Scores, and firm-level controls (2013-20)

Dependent variable: Return on assets (income minus taxes in ratio of total assets), percent

	(1)	(2)	(3)	(4)
E	.048***			
	(.0161)			
S		.059***		
		(.023)		
G			.0352***	
			(.0113)	
Overall ESG				.11***
				(.0134)
Total assets	-.0110***	-.013***	-.010***	-.011***
	(.008)	(.003)	(.003)	(.003)
Debt to assets	-.017	-.018	-.019	-.013
	(.017)	(.017)	(.015)	(.016)
Real GDP growth	.012	.009	.014	.012
	(.011)	(.008)	(.013)	(.012)
CPI Inflation	.0015	-.002	.0010	-.0009
	(.0015)	(.002)	(.0015)	(.0010)
Constant	.402***	.456***	.399***	.427***
	(.043)	(.048)	(.036)	(.0418)
Observations	544	603	580	571
Adjusted r-sq	0.34	0.36	0.34	0.40
Country fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y

Notes. Table 4 reports results of estimating equation (1). Huber-consistent (robust) standard errors are reported in parenthesis, and clustered by country. Notation on significance is given by: *** p<0.01, ** p<0.05, * p<0.1 where p denotes p-value.

Table 5. Returns on assets and E, S and G Scores, with firm-level and macroeconomic controls (2013-20)

Dependent variable: Return on assets (income minus taxes in ratio of total assets), percent

	(1)	(2)	(3)	(4)
E	.048***			
	(.0161)			
S		.059***		
		(.023)		
G			.0352***	
			(.0113)	
Overall ESG				.11***
				(.0134)
Total assets	-.0110***	-.013***	-.010***	-.011***
	(.008)	(.003)	(.003)	(.003)
Debt to assets	-.017	-.018	-.019	-.013
	(.017)	(.017)	(.015)	(.016)
Real GDP growth	.012	.009	.014	.012
	(.011)	(.008)	(.013)	(.012)
CPI Inflation	.0015	-.002	.0010	-.0009
	(.0015)	(.002)	(.0015)	(.0010)
Constant	.402***	.456***	.399***	.427***
	(.043)	(.048)	(.036)	(.0418)
Observations	544	603	580	571
Adjusted r-sq	0.34	0.36	0.34	0.40
Country fixed effects	Y	Y	Y	Y
Year fixed effects	Y	Y	Y	Y

Notes. Table 5 reports results of estimating equation (1). Huber-consistent (robust) standard errors are reported in parenthesis, and clustered by country. Notation on significance is given by: *** p<0.01, ** p<0.05, * p<0.1 where p denotes p-value.

3.2 Firm-level and Macroeconomic Controls

Finally, the paper turns to a more expanded set of controls which includes macroeconomic variables. While country fixed effects in the preceding regressions absorb intrinsic differences such as tax stringency and disclosure requirements, returns may vary with business cycle factors like GDP growth and inflation.

Table 5 reports results of estimating variant (c) above. The first important result is that the estimated coefficients of E, S, G (as well as the Overall ESG score) remain statistically significant. However, each of their coefficient estimates shrinks in magnitude relative to those in Table 5 – this result suggests that the macroeconomic variables have positive covariance with E, S and G and that their impact on returns is partially absorbed by these variables. The second important result is that the macroeconomic variables bear the expected signs, but are not statistically significant. The most natural interpretation of with this finding is that country fixed effects take account of the key macroeconomic conditions—such as differences in E, S, G regulations, tax stringency, competition law—that affect returns.

In summary, the combined set of regressions present evidence that each of the individual pillars of environmental, social, and governance strategies are positively associated with corporate profitability. These results are robust to the inclusion of key firm-level and macroeconomic variables that the literature suggests are important for returns on assets. In comparison to other papers which have significantly focused on the composite ESG score, these results indicate that profitability is positively associated with corporate investment in any of the three key pillars of ESG. By taking account of country and year fixed-effects, these results are also robust to intrinsic differences in jurisdictions, and business cycle effects, that affect corporate performance.

4. Conclusions

Corporations represent an extremely important vehicle for advancing environmental, social and governance (ESG) goals toward climate change mitigation and sustainable economies. Proponents of ESG strategies stress that investment in sustainable practices is a win-win strategy that will not only deliver on sustainable development goals, but are critical for long-run financial performance. This view has been challenged by detractors of the ESG agenda who caution that that even if corporate sustainability practices can deliver the desired improvements in ESG, there is no disputing that investments in these practices will entail large upfront costs that reduce corporate profitability. A large body of empirical research, analyzing a wide range of financial performance measures and focusing on combined measures of all pillars of the ESG has found mixed conclusions.

This paper re-examines the corporate sustainability-corporate profitability nexus, shedding light on the role of the E, S and G pillars individually and jointly, taking account of both firm-level and country-level differences. Employing fixed effects panel data estimators and using returns on assets as a forward-looking measures of corporate performance, the results suggest that *each* of the E, S and G pillars is statistically associated with stronger corporate performance. The results are robust to differences in firm size and access to capital markets, as well as business cycle considerations that can impact financial performance. An open question for future research is whether the findings of this paper are driven by the specific measures of ESG drawn from Thomson Reuters, and whether they can be overturned by alternative measures.

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Notes

Note 1. See Atz, Holt, Liu and Bruno (2021) for a meta-analysis of the ESG literature, and references within.

Note 2. In the regressions, the measures are scaled by 100 so that the coefficient estimates can be presented succinctly.

Note 3. The environment pillar depends on of resource use, innovation, and emissions; the social pillar is derived from scores given to human rights, workforce, community and product responsibility; and governance from management, shareholders and a CSR strategy; a detailed description of the sequential manner in which these metrics are calculated is provided in Thomson Reuters Eikon (Thomson Reuters Eikon 2022).

Note 4. In interpreting the results, recall that the scores are scaled by 100 so that they lie between 0.01 and 1. See footnote to Table 2.

Note 5. They are not perfectly collinear since debt-to-assets is a nonlinear transform of assets, and because total assets are in natural logarithms whereas debt is called by assets without logs.