Real Estate & Planning

HENLEY
UNIVERSITY OF READING

Working Papers in Real Estate & Planning 15/11

Do Responsible Real Estate Companies Outperform Their Peers?[1]

Marcelo Cajias[2], Franz Fuerst[3], Patrick McAllister[4], Anupam Nanda[5]*

Draft: August 26, 2011

ABSTRACT

This paper investigates the relationship between corporate social and environmental performance and financial performance for a sample of publicly traded US real estate companies. Using the MSCI ESG (formerly KLD) database on seven Environmental, Social & Governance dimensions in the 2003-2010 period, and weighting the dimensions according to prominence in the real estate sector, we model Tobin's Q and annual total return in a panel data framework. The results indicate a positive relationship between ESG rating and Tobin's Q but this effect is driven by ESG concerns rather than strengths. Consistently across all model specifications, overall ESG ratings are associated with lower returns. Negative scores appear to result in higher returns in the short run but positive scores have no significant impact on returns.

Keywords: Environmental Social Governance, Corporate Social Responsibility, Corporate Financial Performance, Real Estate, Panel Data.

JEL Classifications: M14, D22, G30, C33.

---

[1]The authors (Fuerst, McAllister and Nanda) would like to acknowledge financial support from the Royal Institution of Chartered Surveyors (RICS) Education Trust and University of Reading, School of Real Estate and Planning, UK. The authors would like to thank Robert Edelstein, Qiulin Ke, Graeme Newell, Rainer Schulz as well as participants at the 2011 ARES, ERES and Joint International AREUEA-AsRES Meetings and University of Aberdeen seminar for valuable comments. All remaining errors are ours.

[2] Marcelo Cajias, University Regensburg, IREBS, marcelo.cajias@irebs.de

[3] Franz Fuerst, University of Cambridge, Land Economy, ff274@cam.ac.uk

[4] Patrick McAllister, University of Reading, Henley Business School, Real Estate & Planning, p.m.mcallister@henley.reading.ac.uk

[5] **Corresponding Author* - Anupam Nanda, University of Reading, Henley Business School, Real Estate & Planning, Whiteknights, Reading, RG6 6UD, UK, E-mail: a.nanda@reading.ac.uk Tel: +44 118 378 6339; Fax: +44 118 378 8172.

INTRODUCTION

Primarily driven by climate change and mirroring a paradigm shift in public concern, environmentally responsible and sustainable business practices have become more prominent for corporations' strategic and operational activities. For investors, the scope of responsible investment can cover not only environmental issues and climate change mitigation but also the effects of businesses on a broad range of social and ethical concerns. The paper investigates the implications of this strategic shift in the allocation of resources towards such ethical concerns for the performance of commercial real estate companies. Specifically, it aims to assess whether there is a link between the Environmental, Social and Governance (ESG) ratings of large real estate companies and their financial performance. We have organized the paper as follows. The next section situates our research question within the existing literature. In the third section, we describe our data and present the summary statistics. Our empirical methodology is outlined in the fourth section and the results from the empirical analysis are discussed. Finally, conclusions are presented.

RELATED LITERATURE

Whilst it is possible to identify the influences of ethical and moral concerns in finance, investment and business throughout history, such concerns have become increasingly salient since the 1960s. In particular, in the last two decades, a plethora of acronyms such as ESG, CSR (Corporate Social Responsibility) and SRI (Socially Responsible Investment) have become increasingly mainstream. Whilst the scope of these labels has been mutating and contested, there is some common ground. At their core is the incorporation of non-financial issues in investment and business decision-making.

Understanding the rationale for firms to allocate resources to ESG is clearly a relevant issue in terms of the expected effect on financial performance. Indeed, since it involves costs to firms, there has long been debate about whether firms should be allocating any resources towards ESG. Implying that resources allocated to ESG constitute a deadweight loss and a negative relationship

between corporate social performance (CSP) and corporate financial performance (CFP), Milton Friedman notoriously stated that "*the social responsibility of business is to increase its profits*". The counter-argument has been that narrow neo-classical theories of the firm neglect the contribution of human and social capital to corporate financial performance. The contention is that ESG activities can improve firms' competitiveness by increasing demand from socially responsible consumers and by generating image and reputational benefits. The latter can, in turn, produce additional advantages linked to reductions in regulatory risk and lower costs from campaigns by social and environmental activists and non-governmental organizations (see Bagnoli and Watts, 2003, Maxwell *et al*, 2000).

In a useful taxonomy, Bansal and Roth (2000) proposed three types of motive profiles that can individually or together stimulate a higher level of ESG commitment - the caring profile, the competitive profile and the concerned profile. In the caring profile, it is the organizational leadership that is the key driver of a firm's ESG commitment. This can be characterized as a championing effort where improving the financial performance of the firm is not a primary objective. In the competitive profile, a firm is motivated by business advantage. Depending on the extent or existence of advantages, competitors may respond if improved ESG performance is perceived to create a competitive threat. Finally, the concerned profile is characterized in terms of a pre-emptive, collective response by a group of market participants in an industry that introduces improvements in ESG performance in order to obtain reputational and regulatory benefits. Both the competitive and concerned profiles imply that the primary aim of ESG activities is to improve CFP. In reality, the most likely pattern is mixed motivation with ESG activities but combinations of championing, competitive and concerned drivers. Nevertheless, improvements in financial performance can be directly linked to rationales for allocating resources to ESG activities.

In terms of *a priori* expectations, ESG has been analyzed through a number of theoretical lenses which generate contrasting expected relationships between CSP and CFP. For instance, instrumental stakeholder theory stresses the contribution of relationships with key stakeholders (other than shareholders) such as employees, suppliers, customers and the local community to financial performance. Closely related stakeholder–agency theory emphasizes how ESG

activities can reduce the agency costs within corporate structures by improving interest alignment and monitoring of the actions of employers, managers and employees. Similarly, firm-as-contract theory also highlights the significance of, often implied, contracts with stakeholders as drivers of firms' financial performance. Hence, the expected causal relationship is that CSP should determine CFP. In contrast, slack resources theory implies the opposite relationship – that CFP determines CSP. It proposes that surpluses generated by prior financial performance release resources for ESG activities. While theories are often presented as mutually exclusive, it is possible that, similar to issue of motivation, the relative importance of resource availability and the salience of relationships with stakeholders may vary between sectors or firms and/or over time.

There is a voluminous empirical literature examining whether CSP predicts CFP. Not surprisingly, it has produced an assortment of findings (for reviews see Orlitzky, Schmidt and Rynes, 2003; Margolis, Elfenbein and Walsh, 2007; van Beurden and Goessling, 2008; Horvathova, 2010). Whilst a detailed review of this literature is outside the scope of this paper, it is clear that the topic is fraught with problems due to potential publication bias, differences in sampling periods and contested statistical procedures. Ruf *et al* (2001) propose that causes of the identified lack of consistency in empirical studies include weak theoretical foundations, inadequate and inconsistent measurement of CSP and CFP, weak methodology and sampling problems.

However, recent reviews suggest that the balance of the evidence is supportive of a positive relationship between ESG performance and financial performance. Van Beurden and Goessling (2008) suggest that earlier reviews included too many papers from the period 1970-90 when the issue of ESG had low socio-political prominence. Their review of studies from 1990 onwards concluded that the vast majority of studies had found a positive relationship between ESG performance and financial performance. Hence, Vogel (2005, 19) asserts that "*Were Friedman now to revisit this subject, he would find much less to concern him*". Studies of the relationship between CSP and CFP have identified economic sector as a significant variable (see Chand, 2006). It has been suggested that, since different industries have different exposure to social, environmental and governance issues, studies encompassing many sectors can conceal sector-

specific effects (Griffin and Mahon, 1997). Indeed, Chand (2006) suggests that research on the link between ESG performance and financial performance should focus on a single industry.

Within the real estate literature, empirical estimation of the relationship between CSP and CFP has received little attention. There is a body of essentially descriptive and/or qualitative work that has largely focused on the investigating the increasing importance of SRI and ESG issues for real estate investors (for examples, see Newell, 2008 and 2009; Rapson, Shiers, Roberts and Keeping, 2007). Focusing largely on governance *per se*, there is a body of work looking at US REITS on the relationship between governance ratings and other agency costs with financial performance (for examples, see Bauer, Eichholtz and Kok, 2010; Bianco, Ghosh and Sirmans, 2007; Hartzell, Kallberg and Liu, 2008). Results have been mixed. Hartzell *et al* (2008) find that firms with stronger governance structures have higher initial IPO valuations and have better long-term operating performance than their peers. In contrast, Bauer *et al* (2010) find that their index of governance strength is related neither to REITs' Tobin's Q nor to Return on Assets, Return on Equity and Funds from Operation. They suggest that, since the result contrasts with previous findings from studies of wider corporate performance, due to requirement to distribute at least 90% of operational earnings there are reduced agency costs for REITs and governance is, consequently a less important factor.

In terms of a theoretical framework, it is clear that a substantial proportion of empirical studies in ESG literature have found a positive relationship between CSP and CFP with varied degree of significance and strength. However, as mentioned previously and suggested by Surroca, Tribó and Waddock (2010), the empirical findings of a positive relationship between corporate social and financial performance may be spurious due to failure to identify the mediating effects of intangible resources. Surroca *et al* (2010) attempt to explore the missing link through which the effect (if any) may be transmitted. Their results indicate that there may be an indirect relationship that relies on the mediating effect of a firm's intangible resources.

[Insert Figure 1]

The mechanism by which a strong ESG commitment is value adding in terms of improved CFP can be difficult to disentangle. In Friedmanian terms, the direct costs of allocating capital to ESG activities are relatively straightforward to measure. As Figure 1 indicates, the direct costs are associated with the implementation, monitoring and reporting of an active ESG strategy. Indirect costs are also produced by the rejection of potential profitable business opportunities that may conflict with ESG-related objectives. It is not axiomatic that benefits are dominated by costs. Analyses of how CSP affects CFP in terms of returns, risks and company value tend to focus on more nebulous (but possibly no less important) factors. Linking back to stakeholder and firm-as-contract theories, the arguments for a positive effect on financial performance tend to emphasize increases in relational wealth (see Luo and Bhattacharya, 2009). Factors broadly related to trust, such as increased transparency and reduced information asymmetry, may create reputational and branding benefits that improve key relationships with employees, shareholders, customers, suppliers and the community. A strong ESG commitment implies more information about the expected cash flow distribution, reduced principal-agent costs and lower investors' risk premium. More directly, the cost of capital may be reduced as socially responsible investors may be prepared to accept a lower return from socially responsible businesses.

As a result, it is argued that companies with strong ESG commitments are more operationally and financially stable and resilient. These potential positive effects of ESG activities on CFP are then, mediated through a range of variables such as governance structures and reputation benefits *inter alia.* Both costs and benefits are mediated through the capital markets where intangible assets are priced and returns generated. However, assuming efficient market pricing of investment in ESG, the returns from ESG are expected to be contingent upon the nature of the firm, the specific business sector and conditions in the broader business environment (see Campbell, 2007). Further, at the firm level, it has been argued that there may be an optimal level of investment in ESG producing a curvilinear relationship between CSP and CFP.

Dam (2006) explains much of the inconsistency in empirical findings as a consequence of the range of metrics of corporate financial performance used. Classifying CFP measures into three categories focused on firm value (e.g. Tobin's Q), operational financial performance (e.g. return on assets) and stock market performance (e.g. total return), the author demonstrates expected

positive effects for firm value and operational financial performance variables. However, this model suggests that the effects of ESG performance on stock market returns are ambiguous due to the trade-off between opposing effects of a lower cost of capital because of access to SRI investors and a higher cost of capital due to the internalization of non-market costs. It is argued that negative effects on stock market returns will be observed where the increased demand for shares decreases the relative return of socially responsible firms.

Clearly, the conflicting expectations generated by different theoretical perspectives and previous empirical research provide ample opportunity to generate numerous competing hypotheses. In addition, robust empirical analysis of the (dynamic) relationship between CSP and CFP requires some consideration of a number of potential causality issues. For instance, if there is a positive contemporaneous association between the two variables, it could be due to superior CSP causing improved CFP. Alternatively, superior CFP could be causing improved CSP. Another possibility is that an exogenous variable may be jointly determining improvements in CSP and CFP. A further potential complication is that elements of all these relationships may create intricate feedback and cascade effects. Therefore, with due caution, we move on to an empirical investigation of the relationship between CSP and CFP in the listed commercial real estate sector.

DATA AND SUMMARY STATISTICS

Largely in response to demand from market participants, metrics have emerged that benchmark corporate social performance (CSP). Although by no means providing perfect measures of CSP, the emergence of such metrics has facilitated a substantial body of research on the causes and effects of variations in CSP. Similar to credit rating agencies, social and environmental rating agencies ostensibly aim to provide independent measures of corporations' ESG performance, increase transparency and reduce the search costs associated with socially responsible investment strategies. Ratings may be based on firms' past performance and/or they can also incorporate a firm's future potential relative position by evaluating their plans to improve future ESG performance (see Chatterji, Levine and Toffel, 2009). It should be acknowledged that the quality

of ESG ratings have been subject to some criticisms concerning their own lack of transparency and have been subject to little robust evaluation themselves (see Chatterji *et al*, 2009). Hawken's (2004) scathing report on the SRI mutual fund sector highlighted the arbitrariness and inconsistencies in criteria used to assess firms' suitability for inclusion in responsibly invested portfolios.

As stated above, this study draws upon the MSCI ESG database. Its social and environmental ratings are one of the most long established and have been widely used by academic researchers. Created by Kinder, Lydenberg and Domini and Co., the ESG (formerly KLD) index uses a proprietary system to assess companies on seven aspects of their ESG performance. They are community relations, corporate governance, diversity, employee relations, environment, human rights and products. Various scales are used to assess the performance in terms of major strength, minor strength, major weakness etc. The number of indicators has varied from year to year with an upward trend. The index is constructed from a combination of publicly available sources, other data organizations, direct communication with companies themselves and government information. Typically, the annual data is published several months after the end of the calendar year. This means that the 'contemporaneous' MSCI ESG score refers to a company's ESG performance in the previous calendar year. This point is further complicated by the fact that ESG MSCI ratings incorporate some information that is already public knowledge and hence priced accordingly in the market whilst part of the information set may be new, particularly the new information on a company's overall ESG performance compared to a benchmark group.

To create a summary measure of overall ESG performance, we first combine the information on sets of strength and concerns using the following formula:

$$ESG_{it} = \left(\frac{\sum_{S=1}^{n} S_{it} * 100}{S_t} * 100 - \frac{\sum_{C=1}^{n} C_{it} * 100)}{C_t} * 100 + 100 \right) / 2 \qquad (1)$$

Where S_{it} and C_{it} are individual binary strength and concern ratings for real estate company i at time t and the denominators S_t and C_t represent the total number of rating criteria respectively in

a given year. Although the number of strengths and concerns changes over the years, this calculation method ensures comparability over time. A score of 50 always implies a neutral position, relative to strength and concerns; a score greater than 50 implies more 'strengths' than 'concerns'. The farther the score is from 50 (towards 100), the stronger is the relative 'strength'; a score less than 50 implies more 'concerns' than 'strengths' and farther the score is from 50 (towards 0), the stronger is the relative 'concerns'. This index formulation combines the number of strengths and concerns on a continuous scale and facilitates comparison across companies.

Previous studies have argued that the above method of creating a combined ESG score is problematic as all ESG criteria are treated as equally meaningful or important in the calculation of the score (see Griffin and Mahon, 1997; Simpson and Kohers, 2002). This problem is likely to be even more pronounced in a sectoral study of listed US real estate companies where some of the criteria may be irrelevant (e.g. investments in tobacco, firearms, nuclear power as well as most human rights issues) while other criteria may be crucial for an ESG assessment of this sector (e.g. environmental criteria or governance issues).

Therefore, we devise a weighted ESG score in the following manner:

$$ESG_{it} = \sum_{j=1}^{n} S_{it} w_{jt} - \sum_{j=1}^{n} C_{it} w_{jt} + 1 \tag{2}$$

Where S_{it} and C_{it} are individual binary strength and concern ratings for real estate company i at time t multiplied by the criterion weights w_{jt}. In this index, a score of 1 represents a neutral position where strengths and concerns balance each other out whereas score below 1 indicate more concerns than strengths and vice versa for scores above 1.

The weights in Equation 2 are derived by:

$$w_{jt} = \frac{\sum_{j=1}^{n} S_{it} + \sum_{j=1}^{n} C_{it}}{\sum_{i=1}^{n} \sum_{j=1}^{n} S_{it} + \sum_{i=1}^{n} \sum_{j=1}^{n} C_{it}} \tag{3}$$

Thus, the weight of an ESG criterion in year *t* is based on the sum of individual binary counts for all real estate companies for this criterion over the sum of all criteria and real estate companies in that year. Put simply, the weight of a criterion is determined by the number of non-zero weightings for real estate companies in a particular year. In contrast to the un-weighted calculation, strengths and concerns are allowed to be asymmetric to the extent that the sum of weights of strengths does not necessarily equal the sum of weights of concerns. This weighting scheme is in principle equivalent to a Paasche current-weighted-index in that the individual weights of the criteria vary from year to year.

The source of the firm financial data used in this analysis is Thomson Reuters Datastream. The real estate sector includes real estate services (brokers and real estate agents), development companies, investment companies and REITs, but excludes pure construction companies. Our sample consists of 341 real estate companies in the unbalanced sample (139 in the balanced panel) over 2003-10. Of these, 148 companies or 43% of the unbalanced sample are REITS (69 or 50% in the balanced sample). Although all firms in the defined set have considerable exposure to real estate markets, a subset of them are classified in wider areas such as financial services, construction, *inter alia.* Table 1 gives a detailed overview of variable definitions and sources. We use ICB codes for industry classification as used by FTSE and Dow Jones and Thomson Reuters Datastream. Table 2 provides descriptive statistics of the variables used in the panel data analysis.

[Insert Tables 1 and 2]

The correlation matrix for the variables used in the econometric models is shown in Table 3. At first glance, the ESG variables of interest do not appear to be highly correlated with either Tobin's Q or Total Returns. To examine within-sector variation in the key variables (Tobin's Q, Total Return and ESG weighted score), Table 4 shows the development of these variable over the 2003-2010 study period. Throughout this period, Tobin's Q is lowest for the home construction sector and highest for real estate companies in the financial service sector. There is a general marked decline in Tobin's Qs across all industries during the years of the financial crisis from 2007 onwards. This pattern is even more pronounced in the total return figures which

turn sharply negative across real estate sub-sectors in 2007-08. Interestingly, the home construction industry appears to have been affected by this negative trend earlier than other real estate companies. Regarding the ESG scores, it is remarkable that the scores of all industries except hotels have dropped considerably in the most recent year (2010). It is not clear whether this is due to the introduction of new criteria and definitions into the MSCI ESG scores or a lagged effect of the recession and financial crisis. While the analysis of sectoral trends provides interesting clues about the overall development of the variables of interest, a more fine-grained analysis of firm-level effects is required.

[Insert Tables 3 and 4]

EMPIRICAL FRAMEWORK

The research strategy of our empirical analysis involved two stages. Before estimating empirical relationships in a panel data framework, we examine the direction of causality through a standard Granger causality test using Vector Auto-Regression (VAR) which treats all variables symmetrically without imposing any *a priori* assumption about causality. In the panel framework, the VAR model can be specified as follows (see Holtz-Eakin, Newey, and Rosen, 1988):

$$p_{it} = \alpha_{0t} + \sum_{i=1}^{m} \alpha_{1t} p_{it-1} + \sum_{i=1}^{m} \delta_{1t} K_{it-1} + \tau_t X_i + \varepsilon_{it} \quad (4)$$

where p_{it} is the performance measure for the firm *i* in year *t*. K_{it} is the ESG score for the firm *i* in year *t*. α_{0t},…, α_{mt}, δ_{1t},…, δ_{mt}, τ_t are the coefficient of the linear projections of intercept, past values of p_{it} , K_{it} and the individual effects (X_i). In this Granger causality test, first differences are taken to eliminate the individual effects and one period lags are included in the model.

In the next stage of the analysis, we test the influence of ESG rating on firm value by regressing firm-level performance variable (Tobin's Q or total return) on the contemporaneous and lagged ESG score (measured at *t* and *t-1*). The standard OLS model in a panel setting (pooled OLS) is:

$$p_{it} = \alpha + \beta K_{it} + \gamma X_{it} + Z_t + \varepsilon_{it} \quad (5)$$

where X_{it} is the vector of firm-level financial attributes (e.g. leverage, volatility, net sales and market cap) of firm *i* in year *t*. Z_t is the industry-level return (e.g. NAREIT index) in year *t*.

In Equation 5, strict exogeneity is assumed between the regressors and the error term. However, more often than not, economic and financial relationships in aggregate and disaggregate data suffer from unobserved heterogeneity. This simply implies that the OLS assumption of orthogonality or exogeneity or non-correlation among dependent variables and the residual is not tenable. The unobserved effects may stem from cross-sectional or temporal variation (or both) as follows:

$$\varepsilon_{it} = \delta_i + \theta_t + \omega_{it} \quad (6)$$

where δ_i is the firm-specific effect; $\theta_t$is the time effect; and $\omega_{it}$is the idiosyncratic error. As a result of two-way error component structure specified in Equation 6, the intercept in Equation 5 may vary across the firms or the time periods. Consequently, these effects may bias the estimates. The panel data framework applied in the next stage of the analysis is a more appropriate tool for isolating the effect of ESG performance on financial performance. To this end, we employ two standard methods to eliminate the unobserved heterogeneity: first-differencing (FD) and fixed effects (FE) or Least Squares Dummy Variable (LSDV) models which are similar in structure.

In a simple way, we can 'difference out' the fixed effect by subtracting (*t-1*) values from *t* as follows:

$$(p_{it} - p_{it-1}) \equiv \Delta p_{it} = \beta \Delta K_{it} + \gamma \Delta X_{it} + \Delta Z_t + \Delta \varepsilon_{it} \quad (7)$$

Time-invariant unobserved heterogeneity is canceled out in Equation 7. The FD estimation in Equation 7 is also efficient when ε_{it} follows a random walk. However, it is likely that the

assumption of no autocorrelation is violated in multiple panels. As a result, the standard errors will be biased. The GLS or Huber-White sandwich estimators address this problem effectively. Hence, Equation 7 uses the robust standard error specification following Arellano (1987) which is valid in the presence of heteroscedasticity and/or serial correlation, especially in a panel with a small number of time periods compared to the number of cross-sections as is the case here (see Wooldridge, 2002 for a discussion).

An alternative way of eliminating unobserved heterogeneity is the FE or LSDV specification which is equivalent to 'de-meaning' or 'mean-differencing' the variables across cross-sections and time-periods respectively.

$$p_{it} = \alpha + \beta K_{it} + \gamma X_{it} + Z_t + \delta_i + \theta_t + \omega_{it} \quad (8)$$

δ_i are the firm-specific dummies; θ_t are the time dummies; and $\omega_{it}$is the idiosyncratic error. The key distinction between Equations 7 and 8 is how 'within cross-section' and 'between cross-section' variations are dealt with. In multiple panels (T>2), the nature of the idiosyncratic error, ω_{it}, should guide the choice between FD and FE estimator. The FE estimator is more efficient when ω_{it} contains no serial correlation, which is rarely the case in economic and financial data. Conversely, the FD estimator is more efficient when ω_{it} follows a random walk (see Wooldridge, 2002 for a discussion). To provide robust estimations, we employ both approaches in our analysis and compare the results.

FINDINGS

A common criticism of previous studies on the link between ESG and financial performance has been that they did not pay sufficient attention to the problem of circular causality. To wit, companies with superior CFP may have slack resources that they may spend on ESG which may in turn enhance subsequent CFP. In our analysis, we first investigate whether CSP predicts CFP or vice-versa as noted in the previous section. The dependent variables tested for Granger causality were Tobin's Q, total return and ESG score. Table 5 shows the results of the empirical

estimation. Overall, we do not detect Granger causality neither from Tobin's Q to ESG score nor from total return to ESG score. However, it is important to note that the ESG ratings contain considerable between-group variation rather than within-group variation which may not be captured by the first-difference estimation that we employ for estimating Equation 4. Overall, Granger causality tests do not support the hypothesis of a circular causality.

[Insert Table 5]

Next, we estimate the effect of ESG scores on the market valuation represented by the Tobin's Q of a company. Table 6 presents the model estimates applying a panel regression with firm fixed effects as well as an estimation using first differences. The baseline model contains control variables for intra-year volatility, volume of net sales, the size effect reflected in the market cap as well as the NAREIT index as a proxy for real estate market conditions. ESG scores are included both as contemporaneous and lagged predictors. In total, five model variations are estimated for weighted and un-weighted aggregate ESG indexes as well as for separate ESG strengths and concerns.

The coefficients of the control variables are generally consistent across all model specifications. While leverage exhibits a significantly positive effect, volatility has a highly significant negative relationship effect on Tobin's Q. All model variations show a significant positive impact of company size and a negative impact of both intra-year volatility of a company's stock price and net sales. The NAREIT index appears to have a positive effect on Tobin's Q, particularly when the weighted ESG index is included. As a robustness check, we also estimate the models using a balanced panel and find the results to be consistent with the unbalanced set in terms of explanatory power as well as magnitudes, signs and significance of coefficients (see Table A1).

Turning to the variable of interest, we find an overall positive impact of contemporaneous ESG performance on the market valuation of a company. This effect is generally stronger when the weighted ESG index is used which is in line with our expectations as the weighting process emphasizes ESG criteria that are of higher relevance to the real estate sector. Lagged ESG scores were not significant in explaining Tobin's Q. Next, we estimate the impact of ESG concerns and

strengths separately in order to detect any differential impact a positive or negative rating may have. We find that ESG concerns indeed affect market valuation negatively. However, no significant positive link is confirmed for ESG strengths. The effects are similar for the un-weighted index albeit at lower significance levels. Again, the weighted ESG index provides stronger statistical support for the negative impact of ESG concerns on Tobin's Q the un-weighted index. Using the balanced panel yields similar results (see Table A1).

[Insert Table 6]

Estimation results of the impact of ESG scores on annual total returns of a company's shares are detailed in Table 7. The explanatory power of the return models is generally lower than it is for Tobin's Q. The control variables leverage, price volatility, net sales, market capitalization and NAREIT index returns all have a negative effect on total returns. For ESG scores, we find a consistent and strongly significant negative impact on total returns for both contemporaneous and lagged scores. Again, the effects are stronger for the weighted than the un-weighted ESG index. As discussed in the first section of this paper, lower returns may occur for a number of reasons, perhaps most prominently because investors may demand a lower return in exchange for lower perceived risk of companies with a good ESG score. When a lagged ESG score is included in the estimation, the coefficient turns positive. It is difficult to determine whether this indicates a partial reversion to the mean after an initial drop in returns or whether it is caused by other factors. To decompose the impact of negative and positive scores, we again include ESG strengths and concerns as separate variables and find that concerns exhibit a positive contemporaneous association with a company's returns which then appears to revert, at least partially, in the following year. No significant effects are found for ESG strengths. For the un-weighted ESG index, the effects are weaker but broadly follow the same pattern. Similarly, our robustness check using only the balanced panel also yields similar results (see Table A2). Overall, we find a consistent negative impact of ESG performance on firm-level returns.

[Insert Table 7]

CONCLUSION

Neither the existing empirical evidence nor the current conceptual frameworks provides strong *a priori* expectations for this research. Previous empirical work has not produced consistent findings on whether firms that 'do good' also 'do well'. In addition, there are plausible arguments to justify almost every possible empirical finding. Our conceptual framework proposes a link between ESG performance and its implications for listed real estate companies that is dependent upon the balance of costs and benefits created by the allocation of resources to ESG activities. While most analyses have stressed the growing importance of trust, stakeholders and relationships to business performance, the opportunity cost of ESG investment also need to be acknowledged.

With growing interest in sustainability issues, the real estate sector has been engaging increasingly with Corporate Social Responsibility objectives. Whilst there has been a longstanding and substantial body of work on the relationship between CSP and CFP, ours is a sector-specific analysis providing the first empirical evidence within the real estate sector. Studying this sector is of particular interest as the asset-based nature of the real estate industry allows us to examine whether ESG performance has a weaker impact on asset-based industries than it has on human capital or knowledge-based industries. Another distinct feature of asset-based industries is that their brand recognition is typically low outside of their specialized area, in contrast to, say, consumer goods.

The findings of the study are mixed and consistent with the literature. A consistent result is that a relatively high overall ESG rating affects a company's market value positively. When distinguishing between strengths and concerns, we find that it is concerns about ESG issues that have the strongest effects. Companies with a relatively high number of ESG concerns tend to have significantly lower market values while there does not appear to be a significant effect of ESG strengths. In contrast, a relatively high overall ESG rating affects total returns negatively. This result is consistent across numerous model specifications for both balanced and unbalanced panels. The level of ESG concerns has a significant positive effect on returns while ESG strengths are only weakly linked to lower returns.

It is clear that the transmission of changes in resources allocated to ESG issues to changes in share prices and corporate profitability (and vice versa) raises difficult timing issues with implications for further work. There are both costs and benefits and long and short-term effects associated with investment in ESG. Any ESG changes can be priced instantaneously in the capital markets whilst real effects on business operations are likely to be lagged. This reinforces Dam's (2006) stress on selecting CFP variables carefully. Further, from a real estate perspective, there is scope for further work on the relationship between ESG ratings and asset acquisition strategies. Research on whether real estate investment firms with high ESG ratings also have distinctive asset acquisition criteria, for example a strong preference for eco-certified buildings will help to distinguish the relative contributions of increased relational capital and image benefits compared to investment strategy.

References

Arellano M. 1987. Computing Robust Standard Errors for Within-Groups Estimators. *Oxford Bulletin of Economics and Statistics* **49**(4): 431-34.

Bagnoli M, Watts S. 2003. Selling to socially responsible consumers: competition and the private provision of public goods. *Journal of Economics and Management Strategy* **12**(3): 419–445.

Bansal P, Roth K. 2000. Why companies go green: A model of ecological responsiveness. *Academy of Management Journal* **43**(4): 717– 736.

Bauer R, Eichholtz P, Kok N. 2010. Corporate Governance and Performance: The REIT Effect. *Real Estate Economics* **38**(1): 1–29.

Bianco C, Ghosh C, Sirmans C. 2007. The Impact of Corporate Governance on the Performance of REITs. *Journal of Portfolio Management* **33**: 175–191.

Chand M. 2006. The Relationship Between Corporate Social Performance and Corporate Financial Performance: Industry Type as a Boundary Condition. *The Business Review* **5**(1): 240–245.

Chatterji A, Levine D, Toffel M. 2009. How well do social ratings actually measure corporate social responsibility? *Journal of Economics & Management Strategy* **18**(1): 125–169.

Dam L. 2006. Corporate social responsibility in a general equilibrium stock market model: Solving the financial performance puzzle. University of Groningen Working Paper 2006-03. Available at: http://ccso.eldoc.ub.rug.nl/FILES/root/2006/200603/200603.pdf

Griffin J, Mahon J. 1997. The Corporate Social Performance and Corporate Financial Performance Debate: Twenty-Five Years of Incomparable Research. *Business and Society* **36**(1): 5–31.

Han B. 2006. Insider Ownership and Firm Value: Evidence from Real Estate Investment Trusts. *Journal Real Estate Finance & Economics* **32**: 471–493.

Hartzell J, Kallberg J, Liu C. 2008. The Role of Corporate Governance in Initial Public Offerings: Evidence from Real Estate Investment Trusts. *Journal of Law and Economics* **51**: 539–562.

Hawken P. 2004. *Socially Responsible Investing*. Natural Capital Institute. Sausalito. CA. Available at: http://www.naturalcapital.org/docs/SRI%20Report %2010-04_word.pdf

Holtz-Eakin D, Newey W, Rosen S. 1988. Estimating Vector Autoregressions with Panel Data. *Econometrica* **56**(6):1371-1395.

Horthathova E. 2010. Does Environmental Performance Affect Financial Performance: a meta-analysis? *Ecological Economics* **70**(1): 52–59.

Lee D, Faff R. 2009. Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective. *The Financial Review* **44**: 213–237.

Luo Y, Bhattacharya C.-B. 2009. The Debate over Doing: Corporate Social Performance, Strategic Marketing Levers, and Firm-Idiosyncratic Risk. *Journal of Marketing* **73**: 198–213.

Manescu C. 2010. Economic Implications of Corporate Social Responsibility and Responsible Investments. PhD Thesis. University of Gothenburg.
Available at: http://130.241.192.25/Files/nationalekonomi/Sem/101112%20Manescu%20avh.pdf

Margolis J, Elfenbein H, Walsh J. 2007. Does It Pay to be Good? A Meta-Analysis and Redirection of Research on the Relationship Between Corporate Social and Financial Performance. Mimeo, Harvard Business School, Boston, MA.

Maxwell J, Lyon T, Hackett S. 2000. Self-regulation and social welfare: The political economy of corporate environmentalism. *Journal of Law and Economics* **43**(2): 583–618.

McWilliams A, Siegel D. 2000. Corporate social responsibility and financial performance: correlation or misspecification? *Strategic Management Journal* **21**(5): 603–609.

McWilliams A, Siegel D. 2001. Corporate social responsibility: a theory of the firm perspective. *Academy of Management Review* **26**: 117–127.

McWilliams A, Siegel D, Wright PM. 2006. Corporate social responsibility: strategic implications. *Journal of Management Studies* **43**: 1–18.

Newell G. 2008. The strategic significance of environmental sustainability by Australian-listed property trusts. *Journal of Property Investment and Finance* **26**(6): 522–540.

Newell G. 2009. Developing a socially responsible investment index for UK property companies. *Journal of Property Investment and Finance* **27**(5): 511–521.

Porter M, Kramer M. 2006. Strategy & society: The link between competitive advantage and corporate social responsibility. *Harvard Business Review* **84**(12): 78–92.

Rapson D, Shiers D, Roberts C, Keeping M. (2007). Socially responsible property investment (SRPI): an analysis of the relationship between equities SRI and UK property investment activities. *Journal of Property Investment and Finance* **25**(4): 342–358.

Roberts PW, Dowling GR. 2002. Corporate reputation and sustained superior financial performance. *Strategic Management Journal* **23**(12): 1077–1093.

Ruf B, Muralidhar K, Brown R, Janney J, Paul K. 2001. An Empirical Investigation of the Relationship Between Change in Corporate Social Performance and Financial Performance: A Stakeholder Theory Perspective. *Journal of Business Ethics* **32**: 143–156.

Semenova N. 2010. Corporate Environmental Performance: Consistency of Metrics and Identification of Drivers. Scandinavian Working Papers in Business Administration. Available at: http://swoba.hhs.se/sicgwp/abs/sicgwp2010_009.htm

Simpson, W., & Kohers, T. (2002). The Link Between Corporate Social and Financial Performance: Evidence from the Banking Industry. *Journal of Business Ethics*, **35**(2), 97-109.

Surroca J, Tribó JA, Waddock S. 2010. Corporate responsibility and financial performance: the role of intangible resources. *Strategic Management Journal* **31**: 463–490.

Van Beurden P, Goessling T. 2008. The Worth of Values – A Literature Review on the Relation Between Corporate Social and Financial Performance. *Journal of Business Ethics* **82**(2): 407–424.

Vogel D. 2005. *The Market for Virtue: The Potential and Limits of Corporate Social Responsibility.* Washington, DC: Brookings Institute.

Waddock SA, Graves SB. 1997. The corporate social performance-financial performance link. *Strategic Management Journal* **18**(4): 303–319.

Wooldridge, J. 2002. *Econometric Analysis of Cross-Section and Panel Data*. Cambridge, MA: MIT.

Figure 1: Costs and Benefits of an Active ESG Strategy

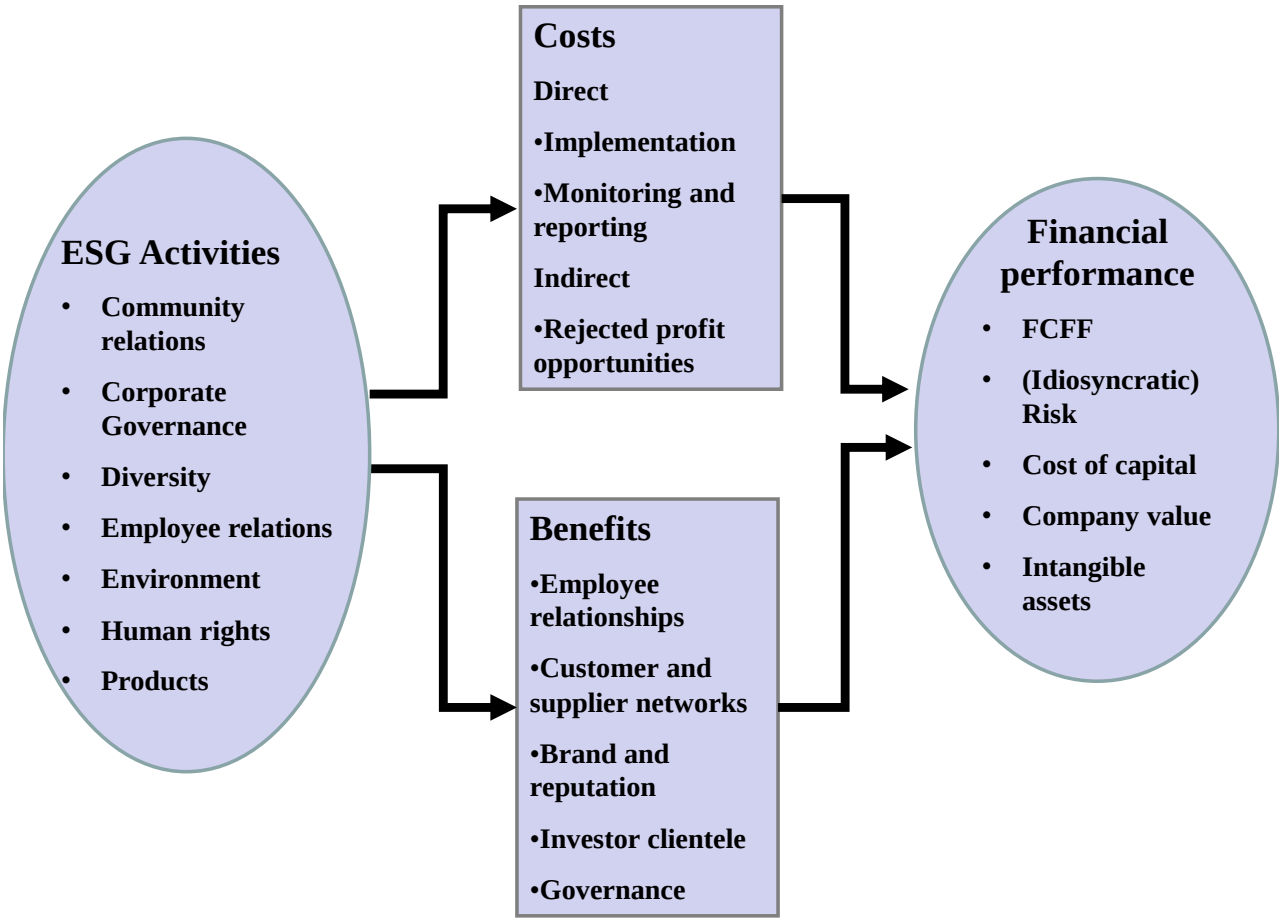

Table 1: Variable Description

Variable	Definition	Source
Tobin's Q	Long term firm value measured as market capitalization plus debt (long and short) term debt and preferred stock divided by total assets as defined by Han (2006).	Datastream
Total Returns	Annual change in the Stock Prices	
Volatility	Stock return volatility (standard deviation) calculated with weekly returns for the present year.	
Sector adjusted Return/Volatility	Return and Volatility adjusted following the sector composition of the sample for each cross section.	
ESG Score Un-weighted	Environmental, social and governance performance index for the corresponding dimension. Calculated as: $$\frac{\left[\left(\frac{\text{Sum of strengths}}{\text{Number of strengths}} * 100\right) - \left(\frac{\text{Sum of concerns}}{\text{Number of concerns}} * 100\right) + 100\right]}{2}$$	ESG-Database
ESG Strengths Un-weighted	Total score of strengths in the corresponding areas for the firm in year t. Calculated as: $$\left(\frac{\text{Sum of strengths}}{\text{Number of strengths}} * 100\right)$$	
ESG Concerns Un-weighted	Total score of concerns in the corresponding for the firm in year t. Calculated as: $$\left(\frac{\text{Sum of concerns}}{\text{Number of concerns}} * 100\right)$$	
Leverage	Ratio, calculated as short term debt and current proportion of long term debt divided by total assets.	Datastream
Net Sales	Represents gross sales and other operating revenue less discounts, returns and allowances.	
Market Capitalization	Calculated as Market Price-Year End * Common Shares Outstanding.	
NAREIT Return	Total annual return of the NAREIT index.	

Table 2: Summary Statistics

Variable	Balanced Panel (139 Firms over 2003-10)			Unbalanced Panel (341 Firms over 2003-10)		
	N	Mean	SD	N	Mean	SD
Tobin's Q	1112	1.442	0.972	2216	1.456	1.125
Total Returns (%)	1112	0.170	0.422	2298	0.193	0.794
Volatility	1112	0.052	0.033	2296	0.065	0.094
Sector Adjusted Return	1112	0.000	0.316	2285	0.000	0.527
ESG Index un-weighted	1112	48.850	2.808	1978	48.864	2.582
ESG Strength un-weighted	1112	2.487	5.070	1978	2.114	4.348
ESG Concern un-weighted	1112	4.787	4.396	1978	4.387	4.276
ESG Index weighted	1112	0.846	0.175	1978	0.845	0.183
ESG Strength weighted	1112	0.028	0.043	1978	0.026	0.041
ESG Concern weighted	1112	0.182	0.159	1978	0.181	0.168
Leverage (%)	1112	42.408	23.064	2430	40.254	25.661
Net Sales ($ billion)	1112	2.018	5.293	2465	1.618	5.351
Market Cap ($ billion)	1112	3.814	7.031	2346	2.834	6.541
Total Assets ($ billion)	1112	11.422	67.826	2482	11.795	73.868
NAREIT Return (%)	8	0.077	0.318	8	0.077	0.317

Table 3: Correlation Matrix
Unbalanced Panel

	Tobin's Q	Total Return	Volatility	Sector Adjusted Return	ESG Index un-weighted	ESG Strength un-weighted	ESG Concern un-weighted	ESG Index weighted	ESG Strength weighted	ESG Concern weighted	Leverage	Net Sales	Market Cap	Total Assets	NAREIT Return
Tobin's Q	1														
Total Returns	0.112	1													
Volatility	(0.124)	(0.187)	1												
Sector Adjusted Return	0.112	0.775	(0.008)	1											
ESG Index un-weighted	0.016	(0.005)	(0.072)	(0.026)	1										
ESG Strength un-weighted	(0.043)	(0.023)	(0.032)	(0.033)	0.613	1									
ESG Concern un-weighted	(0.063)	(0.017)	0.055	(0.003)	(0.584)	0.283	1								
ESG Index weighted	0.023	(0.042)	0.010	(0.031)	0.663	0.294	(0.503)	1							
ESG Strength weighted	0.027	0.002	(0.062)	(0.034)	0.521	0.633	0.019	0.466	1						
ESG Concern weighted	(0.018)	0.046	(0.026)	0.025	(0.595)	(0.163)	0.554	(0.976)	(0.261)	1					
Leverage	(0.126)	(0.052)	0.083	(0.008)	(0.033)	(0.118)	(0.082)	(0.005)	(0.082)	(0.015)	1				
Net Sales ($mill.)	(0.122)	(0.018)	(0.014)	(0.012)	(0.027)	0.393	0.436	0.055	0.221	(0.005)	(0.052)	1			
Market Cap ($mill.)	(0.000)	(0.006)	(0.087)	0.009	0.061	0.416	0.354	0.127	0.245	(0.078)	(0.076)	0.809	1		
Total Assets ($mill.)	(0.114)	(0.021)	0.004	(0.022)	0.005	0.322	0.324	0.046	0.190	(0.003)	0.003	0.872	0.784	1	
NAREIT Return (%)	0.101	(0.013)	(0.508)	0.003	(0.040)	0.049	0.098	(0.262)	0.000	0.286	(0.007)	0.015	0.027	(0.005)	1

Table 4: Summary Statistics of Key Variables across Sub-sectors

	2003	2004	2005	2006	2007	2008	2009	2010
Tobin's Q								
Real Estate Investments Trusts	1.298	1.357	1.434	1.474	1.290	1.191	1.076	1.301
Financial Services	1.731	1.683	2.093	2.284	1.916	1.390	1.356	1.571
Home Construction	1.053	1.173	1.580	0.862	0.784	0.846	1.018	0.989
Hotels	1.258	1.507	1.816	1.750	1.885	1.026	1.128	1.468
Total Returns								
Real Estate Investments Trusts	0.348	0.231	0.111	0.241	-0.184	-0.592	0.268	0.248
Financial Services	0.503	0.117	0.216	0.251	-0.022	-0.846	0.228	0.084
Home Construction	0.633	0.381	0.142	-0.255	-0.949	-0.458	0.301	0.083
Hotels	0.287	0.403	0.143	0.191	-0.175	-1.096	0.251	0.383
ESG weighted overall score								
Real Estate Investments Trusts	0.923	0.881	0.874	0.888	0.905	0.899	0.895	0.572
Financial Services	0.939	0.875	0.858	0.888	0.916	0.903	0.892	0.671
Home Construction	0.950	0.852	0.824	0.788	0.782	0.759	0.752	0.633
Hotels	0.880	0.809	0.833	0.843	0.886	0.875	0.847	0.827

Table 5: Granger Causality Tests

	DepVar: Total Returns				DepVar: Total Returns		
	Chi-sq	df	p-value		Chi-sq	df	p-value
ESG_weighted	0.714	1	0.398	ESG_unweighted	2.439	1	0.118
	DepVar: ESG_weighted				**DepVar: ESG_unweighted**		
	Chi-sq	df	p-value		Chi-sq	df	p-value
Total Returns	0.441	1	0.507	Total Returns	2.158	1	0.142
	DepVar: Log Tobin's Q				**DepVar: Log Tobin's Q**		
	Chi-sq	df	p-value		Chi-sq	df	p-value
ESG_weighted	0.007	1	0.932	ESG_unweighted	0.681	1	0.409
	DepVar: ESG_weighted				**DepVar: ESG_unweighted**		
	Chi-sq	df	p-value		Chi-sq	df	p-value
Log Tobin's Q	0.278	1	0.597	Log Tobin's Q	0.093	1	0.759

NOTES: '***', '**', and '*' denote 1%, 5% and 10% significance levels respectively. One period lags are included in the models.

Table 6: Panel Fixed Effects Regression Results
(Dependent variable: Log Tobin's Q)
Unbalanced Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Weighted Index Formulation						**Un-weighted Index Formulation**				
ESG (t)		0.082* (1.684)	0.220*** (4.226)	0.186*** (3.343)			0.006 (1.400)	0.006* (1.653)	0.002 (0.570)		
ESG (t-1)				0.026 (0.236)					0.009 (0.760)		
ESG Concern (t)					-0.210*** (-3.542)	-0.183*** (-2.971)				-0.010*** (-3.601)	-0.007** (-2.389)
ESG Concern (t-1)						-0.067 (-0.623)					-0.007* (-1.696)
ESG Strength (t)					0.344 (1.353)	0.356 (0.922)				-0.003 (-0.908)	-0.002 (-0.770)
ESG Strength (t-1)						-0.287 (-0.834)					-0.005 (-0.408)
Leverage	0.664*** (5.464)	0.581*** (3.640)	0.548*** (4.140)	0.619*** (4.015)	0.548*** (4.132)	0.620*** (4.049)	0.561*** (4.171)	0.584*** (3.656)	0.646*** (4.159)	0.587*** (4.480)	0.677*** (4.504)
Log(Volatility)	-0.112*** (-4.800)	-0.086*** (-4.028)	-0.075*** (-2.677)	-0.111*** (-3.619)	-0.075*** (-2.645)	-0.109*** (-3.599)	-0.089*** (-3.240)	-0.085*** (-3.964)	-0.120*** (-4.093)	-0.078*** (-2.632)	-0.108*** (-3.199)
Log (Net Sales)	-0.144*** (-4.217)	-0.179*** (-2.677)	-0.218*** (-3.049)	-0.196** (-2.434)	-0.217*** (-3.046)	-0.198** (-2.494)	-0.220*** (-3.033)	-0.179*** (-2.672)	-0.196** (-2.393)	-0.222*** (-3.033)	-0.203** (-2.403)
Log(Market Cap)	0.311*** (10.177	0.362*** (10.383)	0.334*** (8.659)	0.303*** (6.754)	0.334*** (8.671)	0.304*** (6.873)	0.336*** (8.733)	0.363*** (10.388)	0.306*** (6.859)	0.336*** (8.532)	0.306*** (6.628)
NAREIT	0.040* (1.761)	-0.008 (-0.440)	0.079*** (3.079)	0.046* (1.669)	0.078*** (3.051)	0.047* (1.693)	0.079* (1.838)	-0.019 (-1.165)	0.012 (0.564)	0.060** (2.408)	0.029 (1.150)
Fixed Effects Specification	Firm	First difference	Firm	Firm	Firm	Firm	Firm	First difference	Firm	Firm	Firm
Hausman χ^2	63.835***		14.254**	44.732***	17.670**	44.365***	16.944***		115.398***	5.899	60.436***
Adj. R^2	26.85	32.30	27.91	26.75	27.91	26.77	27.23	32.43	26.29	27.80	26.94
N	n=330 T=1-8 N=2154	n=285 T=1-7 N=1490	n=318 T=1-8 N=1831	n=291 T=1-7 N=1541	n=318 T=1-8 N=1831	n=291 T=1-7 N=1541	n=318 T=1-8 N=1831	n=285 T=1-7 N=1490	n=291 T=1-7 N=1541	n=318 T=1-8 N=1831	n=291 T=1-7 N=1541

NOTES: Age variable is calculated as time-variant. T-statistics (with robust standard errors following Arellano [1987] due to N>T) are reported within the parentheses. '***', '**', and '*' denote 1%, 5% and 10% significance levels respectively. All Variance Inflation Factors below 2.95.

Table 7: Panel Fixed Effects Regression Results
(Dependent variable: Total Returns)
Unbalanced Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Weighted Index Formulation						**Un-weighted Index Formulation**				
ESG (t)		-0.510*** (-4.532)	-0.487*** (-4.700)	-0.691*** (-6.562)			-0.014* (-1.772)	-0.021*** (-2.712)	-0.018** (-2.526)		
ESG (t-1)				0.380*** (2.911)					0.018* (1.895)		
ESG Concern (t)					0.503*** (4.635)	0.685*** (6.200)				0.009 (1.602)	0.023*** (3.733)
ESG Concern (t-1)						-0.504*** (-3.604)					-0.020*** (-3.620)
ESG Strength (t)					-0.301 (-0.744)	-0.388 (-0.917)				-0.005 (-1.150)	-0.001 (-0.290)
ESG Strength (t-1)						-0.540 (-1.245)					-0.004 (-0.553)
Leverage	-0.005*** (-3.008)	-0.005* (-1.879)	-0.006*** (-3.133)	-0.005*** (-2.659)	-0.006*** (-3.138)	-0.005*** (-2.665)	-0.006*** (-3.334)	-0.005* (-1.874)	-0.006*** (-3.077)	-0.006*** (-3.314)	-0.060*** (-3.033)
Log(Volatility)	-0.261*** (-5.990)	-0.580*** (-13.133)	-0.385*** (-10.957)	-0.491*** (-16.509)	-0.383*** (-10.876)	-0.487*** (-16.274)	-0.354*** (-10.347)	-0.587*** (-13.143)	-0.450*** (-14.915)	-0.358*** (-10.078)	-0.457*** (-14.961)
Log(Net Sales)	-0.104** (-2.366)	-0.206*** (-3.326)	-0.085** (-2.476)	-0.055* (-1.708)	-0.085** (-2.451)	-0.062* (-1.823)	-0.078** (-2.327)	-0.208*** (-3.345)	-0.060* (-1.894)	-0.078** (-2.291)	-0.062* (-1.851)
Log(Market Cap)	-0.206*** (-5.012)	-0.075 (-1.547)	-0.197*** (-5.337)	-0.226*** (-5.697)	-0.197*** (-5.331)	-0.220*** (-5.622)	-0.202*** (-5.501)	-0.080 (-1.639)	-0.239*** (-5.797)	-0.202*** (-5.467)	-0.233*** (-5.675)
NAREIT	-0.217*** (-4.305)	-0.627*** (-13.666)	-0.355*** (-7.408)	-0.453*** (-9.841)	-0.356*** (-7.422)	-0.448*** (-9.724)	-0.265 (-5.932)	-0.556*** (-12.900)	-0.330*** (-7.554)	-0.273*** (-5.813)	-0.368*** (-8.166)
Fixed Effects Specification	Firm	First difference	Firm	Firm	Firm	Firm	Firm	First difference	Firm	Firm	Firm
Adj. R^2	8.90	23.46	13.59	18.15	13.59	18.35	12.30	23.00	15.31	12.32	16.07
N	n=330 T=1-8 N=2163	n=285 T=1-7 N=1495	n=320 T=1-8 N=1837	n=292 T=1-7 N=1546	n=320 T=1-8 N=1837	n=292 T=1-7 N=1546	n=320 T=1-8 N=1837	n=285 T=1-7 N=1495	n=292 T=1-7 N=1546	n=320 T=1-8 N=1837	n=292 T=1-7 N=1546

NOTES: Age variable is calculated as time-variant. T-statistics (with robust standard errors following Arellano [1987] due to N>T) are reported within the parentheses. '***', '**', and '*' denote 1%, 5% and 10% significance levels respectively. All Variance Inflation Factors below 3.38.

APPENDIX

Table A1: Panel Fixed Effects Regression Results
(Dependent variable: Log Tobin's Q)
Balanced Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Weighted Index Formulation						Un-weighted Index Formulation				
ESG (t)		0.090 (0.847)	0.236*** (3.955)	0.225*** (3.851)			0.005 (1.076)	0.010* (1.690)	0.003 (0.704)		
ESG (t-1)				-0.036 (-0.292)					0.006 (0.382)		
ESG Concern (t)					-0.224*** (-3.223)	-0.194*** (-2.944)				-0.008** (-2.439)	-0.006* (-1.653)
ESG Concern (t-1)						0.006 (0.049)					-0.005 (-0.918)
ESG Strength (t)					0.362 (1.189)	0.704 (1.490)				-0.002 (-0.462)	-0.001 (-0.239)
ESG Strength (t-1)						-0.291 (-0.758)					-0.003 (-0.187)
Leverage	0.762*** (4.316)	0.804*** (2.863)	0.761*** (4.415)	0.896*** (4.907)	0.757*** (4.423)	0.893*** (4.935)	0.770*** (4.404)	0.807*** (2.874)	0.921*** (4.996)	0.800*** (4.590)	0.946*** (5.136)
Log(Volatility)	-0.132*** (-3.584)	-0.083** (-2.103)	-0.115*** (-3.070)	-0.141*** (-3.957)	-0.114*** (-3.052)	-0.137*** (-3.965)	-0.130*** (-3.581)	-0.082* (-2.100)	-0.150*** (-4.426)	-0.119*** (-2.972)	-0.140*** (-3.410)
Log(Net Sales)	-0.176* (-1.961)	-0.148 (-1.532)	-0.177** (-1.972)	-0.175* (-1.959)	-0.177** (-1.968)	-0.177** (-2.007)	-0.177* (-1.957)	-0.418 (-1.544)	-0.174* (-1.908)	-0.180* (-1.943)	-0.180* (-1.889)
Log(Market Cap)	0.351*** (6.508)	0.475*** (11.762)	0.353*** (6.499)	0.342*** (5.834)	0.353*** (6.486)	0.343*** (5.912)	0.352*** (6.555)	0.478*** (11.804)	0.346*** (5.907)	0.354*** (6.278)	0.345*** (5.641)
NAREIT	-0.010 (-0.388)	-0.065*** (-2.794)	0.029 (0.978)	0.012 (0.421)	0.029 (0.974)	0.012 (0.436)	-0.009 (-0.328)	-0.074*** (-3.799)	-0.021 (-0.920)	0.008 (0.250)	-0.010 (-0.367)
Fixed Effects Specification	Firm	First difference	Firm	Firm	Firm	Firm	Firm	First difference	Firm	Firm	Firm
Hausman χ^2	25.253***		31.071***	26.113***	31.831***	29.827***	38.612***		36.250***	33.960***	30.962***
Adj. R^2	29.63	42.23	30.63	32.94	30.61	33.01	29.71	42.39	32.17	30.16	32.53
N	1112	973	1112	973	1112	973	1112	973	973	1112	973

NOTES: Age variable is calculated as time-variant. T-statistics (with robust standard errors following Arellano [1987] due to N>T) are reported within the parentheses. '***', '**', and '*' denote 1%, 5% and 10% significance levels respectively. Variance Inflation Factors below 2.43.

Table A2: Panel Fixed Effects Regression Results
(Dependent variable: Total Returns)
Balanced Panel

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Weighted Index Formulation						Un-weighted Index Formulation				
ESG (t)		-0.353***	-0.202*	-0.424***			-0.003	-0.009	-0.006		
		(-3.122)	(-1.730)	(-3.834)			(-0.362)	(-1.267)	(-0.911)		
ESG (t-1)				0.377***					0.041		
				(2.768)					(-1.352)		
ESG Concern (t)					0.173	0.399***				-0.002	0.010*
					(1.443)	(3.376)				(-0.415)	(1.839)
ESG Concern (t-1)						-0.537***					-0.019***
						(-3.829)					(-2.892)
ESG Strength (t)					-0.531	-0.342				-0.005	0.004
					(-1.041)	(-0.681)				(-0.885)	(0.856)
ESG Strength (t-1)						-0.869*					-0.009
						(-1.742)					(-1.139)
Leverage	-0.005**	-0.004	-0.005**	-0.003	-0.005**	-0.003	-0.005**	-0.004	-0.004*	-0.005**	-0.004*
	(-2.464)	(-1.639)	(-2.438)	(-1.497)	(-2.360)	(-1.381)	(-2.489)	(-1.566)	(-1.700)	(-2.351)	(-1.657)
Log(Volatility)	-0.351***	-0.544***	-0.365***	-0.442***	-0.368***	-0.439***	-0.352***	-0.550***	-0.419***	-0.344***	-0.415***
	(-8.222)	(-11.167)	(-9.050)	(-14.747)	(-9.091)	(-14.895)	(-8.615)	(-11.357)	(-13.554)	(-8.041)	(-13.962)
Log(Net Sales)	-0.090**	-0.242***	-0.089**	-0.063**	-0.091**	-0.075**	-0.090**	-0.246***	-0.070**	-0.093**	-0.075**
	(-2.324)	(-2.752)	(-2.268)	(-2.101)	(-2.285)	(-2.238)	(-2.345)	(-2.794)	(-2.434)	(-2.334)	(-2.451)
Log(Market Cap)	-0.167***	-0.042	-0.169***	-0.185***	-0.167***	-0.176***	-0.167***	-0.046	-0.191***	-0.166***	-0.189***
	(-4.074)	(-0.693)	(-4.074)	(-5.018)	(-4.012)	(-4.802)	(-4.136)	(-0.770)	(-4.967)	(-4.125)	(-5.024)
NAREIT	-0.259***	-0.557***	-0.293***	-0.375***	-0.293***	-0.370***	-0.260***	-0.512***	-0.311***	-0.248***	-0.329***
	(-5.339)	(-11.993)	(-6.134)	(-8.204)	(-6.147)	(-8.200)	(-5.484)	(-11.864)	(-6.948)	(-5.017)	(-7.172)
Fixed Effects Specification	Firm	First difference	Firm	Firm	Firm	Firm	Firm	First difference	Firm	Firm	Firm
Adj. R^2	15.06	24.43	15.38	18.55	15.40	19.21	15.06	24.01	16.76	15.15	17.47
N	1112	973	1112	973	1112	973	1112	973	973	1112	973

NOTES: Age variable is calculated as time-variant. T-statistics (with robust standard errors following Arellano [1987] due to N>T) are reported within the parentheses. '***', '**', and '*' denote 1%, 5% and 10% significance levels respectively. All Variance Inflation Factors below 1.59